INDEX

A	ASLR (Address Space Layout
Address Sanitizer (ASan), 55	Randomization), 8, 53–54, 87
Address Space Layout Randomization	authentication
(ASLR), 8, 53–54, 87	biometrics, 231–232
advertisingIdentifier, 235	fingerprint authentication,
advertisingTrackingEnabled, 235	safety of, 232
AES algorithm, 226–227	HTTP basic authentication,
AFNetworking, 122–124	110–111, 119–121
alloc, 19	Local Authentication API, 231–232
.app directory, 78–79	TouchID, 231–232
Apple System Log (ASL), 161–164	LAContext, 231-232
application anatomy, 27–38	autocorrection, 175–177
Bundle directory, 33–34	Automatic Reference Counting
Data directory, 34–37	(ARC), 19
device directories, 32–33	autoreleasepool, 19
Documents directory, 34–35	
Shared directory, 37	В
applicationDidEnterBackground, 20, 167,	_
179–180, 183	backtrace (bt) command, 65–66
application extensions, 140–144	BEAST attack, 117
extensionPointIdentifier, 144	biometrics, 231–232
	black-box testing, 77
extension points, 140 NSExtensionActivationRule, 142	blacklisting, 200
NSExtensionContext, 143	blocks, Objective-C
NSExtensionItem, 143	declaring, 18
shouldAllowExtensionPoint	exposing to JavaScript, 150–151
-Identifier, 143	Bluetooth Low Energy (BTLE), 244
third-party keyboards, 144	Bluetooth PAN, 125
Application Support directory, 35	Bonjour, 125
applicationWillResignActive, 180	Boot ROM, 4
applicationWillTerminate, 20, 167, 183	breakpoints, 62
app review, 3–4, 10–12	actions, 70–72, 164
evading, 11–12	conditions, 72
App Store, 3–4,	enabling/disabling, 64
review process, 10–12	setting, 62–64
<u> </u>	brute-forcing, PINs, 214
bypassing, 11–12	bt (backtrace) command, 65–66
ARC (Automatic Reference	BTLE (Bluetooth Low Energy), 244
Counting), 19	buffer overflows, 12, 193–196
ASAn (Address Sanitizer), 55	example, 194–195
ASI (Apple System Leg) 161 164	preventing, 195–196
ASL (Apple System Log), 161–164	Bundle directory, 33–34
	bundle ID, 33, 138

bundle seed ID, 218–219	Cordova, 150, 154–157
BurpSuite, 43–47	Cordova.plist, 156
•	CoreBluetooth, 246
C	Core Data, 204, 223
	CRIME attack, 118
CA (certificate authority), 114–115	cross-site scripting (XSS), 199–200
CA certificate, 44	input sanitization, 200–201
certificate management, 47	output encoding, 201–202
certificate pinning, 114–117, 124	cryptid, 81, 86-90
defeating, 96–97	cryptoff, 86-90
cache management, 170–171	cryptsize, 86-90
removing cached data, 171–174	cURL, 78
Caches directory, 35–36	certificates, 93–94
caching, 36	Cycript, 90, 93–94
CALayer, 182–183	Cydia, 31, 77
canonical name (CN), 128–129	Cydia Substrate, 78, 97–100
canPerformAction, $168-169$.,
categories, Objective-C, 22–23	D
CBPeripheralManager, 246	V
CCCrypt, 186, 226	DAC (discretionary access
$\operatorname{CCHmac}, 229$	control), 4–5
CCRespring, 79	Data directory, 34–37
certificate authority (CA), 114–115	data leakage, 161–188
certificateHandler, 126	Apple System Log, 161–164
CFArrayRef, 112-113	autocorrection, 175–177
CFBundleURLSchemes, 133	breakpoint actions, 164
CFDataRef, 113	cache management, 170–174
CFPreferences, $36, 178$	dynamic-text.dat, 177
CFStream, 48, 107, 128–129	ephemeral sessions, 173
chflags command, 42	HTTP caches, 169–174
clang, 51–53	local storage, 174
class-dump command, 90, 92–93	iCloud, 161
CLBeaconRegion, 244 , 246	avoidance of, 188
CLLocationManager, $240,244$	keylogger, 177
CN (canonical name), 128–129	NSLog,161164
Cocoa, 14	disabling, 163
Cocoa Touch, 14	NSURLSession, 173
code segment, 193–195	pasteboards, 164–169
codesign command, 82	canPerformAction, 168
CommonCrypto, 151, 230, 230	disabling copy/paste, 168-169
CCCrypt, 226	pasteboardDB file, 165–167
CompleteUnlessOpen, 222-223	pasteboardWithUniqueName, $165 – 167$
CompleteUntilFirstUser-	protecting data, 167–169
Authentication, 220	UISearchBar, 165
cookieAcceptPolicy, 237	wiping, 167
cookies, 36	snapshots, 178–184
acceptance policy, 237–238	applicationDidEnterBackground,
theft of, 114	179–180
Cookies directory, 36	preventing suspension, 183–184
copy/paste, disabling, 168–169	screen obfuscation, 179–183

state preservation, 184–187	.default_created.plist, 32
restorationIdentifier, $184-185$	Default-Portrait.png, 179
user preferences, 178	defaults command, 42
Data Protection API, 7–8, 219–225	delegation, 20
Class Key, 220	DES algorithm, 226
CompleteUnlessOpen, 222-223	deserialization, 21
CompleteUntilFirstUser-	developer team ID, 138
Authentication, 220	device directories, 32–33
DataProtectionClass, 223	Device Key, 7
Data Protection entitlement,	device.plist, 32
223–224	didFinishNavigation, 159–160
	-
delegate methods, 224	did messages, 20
detecting, 225	didReceiveCertificate, 126
FileProtectionComplete, 220–221	disassembly, with Hopper, 94–96
isProtectedDataAvailable, 225	discretionary access control
protection levels, 220–223	(DAC), 4–5
DataProtectionClass entitlement, 157	Documents directory, 34–35
data segment, 193–195	Do Not Track, 236–237
dataTaskWithRequest, 18	dpkg command, 96, 99–101
data theft, 161	DTrace, 55, 61
dd command, 88	dumpdecrypted command, 80
debugging, 61–75	$_$ dyld $_$ get $_$ image $_$ name, 10
breakpoints, 62	dylibs, 10
actions, 70–72	dynamic analysis, 55
conditions, 72	dynamic patching, 11–12
enabling/disabling, 64	, 1 0,
setting, 62–64	E
Debug Navigator, 65	•
debugserver, 81–84	emulator, see Simulator
connecting to, 83	encodewithcoder, $21-22$
installing, 81–82	encrypted segment, 84–90
fault injection, 72–73	encryption, 211–230
frames and variables, 64–68	AES, CCB mode, 226–227
and the second s	bad algorithms, 226
lldb, 62–75	CommonCrypto, 225, 230
backtrace (bt) command, 65–66	CCCrypt, 226
expr command, 69	Curve25519, 222
frame select command, 66–67	Data Protection API, 5, 7–8,
frame variable command, 66	219–225
image list, 87	Class Key, 220
print object command, 67–68	CompleteUnlessOpen, 222–223
object inspection, 68	CompleteUntilFirstUser-
tracing data, 74	Authentication, 220
variables and properties, 69–70	
Debug Navigator, 65	DataProtectionClass, 223
debugserver, 8184	Data Protection entitlement,
connecting to, 83	223–224
installing, 81–82	delegate methods, 224
decodeRestorableStateWithCoder, 184	detecting, 225
decrypting binaries, 80–90	FileProtectionComplete, 220—221

encryption, Data Protection API,	F
continued	fault injection, 72–73
FileProtectionCompleteUnless-	File Juicer, 169, 174
Open, 222	File Key, 7
isProtectedDataAvailable, 225	FileProtectionComplete, 220-221
protection levels, 220–223	filesystem monitoring, 58–59
DES algorithm, 226	Finder, 42
Device Key, 7	fingerprint authentication,
disk encryption, 5–7	safety of, 232
Elliptic Curve Diffie-Hellman	forensic attackers, 161
algorithm, 222	format string attacks, 190–193
entropy, 227	NSString, 192–193
File Key, 7	preventing, 191–193
full disk encryption, 5–7	Foundation classes, 14
hashing, 228–230	frames and variables, 68
HMAC (Hash Message	frame select command, 66–67
Authentication Code),	frame variable command, 66
229–230	Full Disk Encryption, 5–7
initialization vector (IV), 226–227	fuzzing, 55
Keychain, 6–7, 113, 186, 211–219	razzing, oo
API, 7	G
backups, 212	G
iCloud synchronization, 219	garbage collection, 18
item classes, 214	gdb, 62
key hierarchy, 6–7	geolocation, 238
kSecAttrAccessGroup, $218-219$	accuracy, 239
protection attributes, 212–214	CLLocationManager, 240
SecItemAdd, 219	risks, 238–239
shared Keychains, 218–219	get-task-allow, 82
usage, 214–217	Google Toolbox for Mac, 202
wrappers, 217–218	GPS, 238
key derivation, 227–228	
key quality, 227–228	Н
Lockbox, 217	handleOpenURL, 136
OpenSSL, 228–229	hashing, 228–230
RNCryptor, 230	Hash Message Authentication Code
SecRandomCopyBytes, 227	(HMAC), 229
TLS (Transport Layer Security),	hasOnlySecureContent, 159–160
127–129	HealthKit, 240–241
entitlements, 218, 223	heap, 8, 53–54, 193
entitlements.plist, 81–82	hidden files, 41–42
entropy, 227	HMAC (Hash Message Authentication
Erica Utilities, 31, 78	Code), 229
/etc/hosts, 49	Homebrew, 46, 88, 94, 99
EXC_BAD_ACCESS, 191	hooking
eXecute Never (XN), 8–9	with Cydia Substrate, 97–100
expr command, 69	with Introspy, 100–103
extensionPointIdentifier, 144	Hopper, 94–96
extractIdentityAndTrust, 112-113	F. L. 2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-

HTML entities, 201	Introspy, 100–103
encoding, see output encoding	iOS-targeted web apps, 147–160
HTTP basic authentication, 110–111,	IPA Installer Console, 78
119–121	.ipa packages, 80
HTTP local storage, 174	IPC (interprocess communication),
HTTP redirects, 113–114	131–145
	application extensions, 131, 140
1	extensionPointIdentifier, 144
	extension points, 140
iBeacons, 244–247	isContentValid, 143
CBPeripheralManager, 246	NSExtensionActivationRule, 142
CLBeaconRegion, $244-246$	NSExtensionContext, 143
CLLocationManager, 244	NSExtensionItem, 143
startMonitoringForRegion, 244	shouldAllowExtensionPoint
iBoot, 4	-Identifier, 143
iCloud, 35, 111, 161, 212, 219	third-party keyboards, 143–144
avoidance of, 187	canOpenURL, 138
IDA Pro, 94	handleOpenURL, 136
identifierForVendor, 234	
iExplorer, 28–29	isContentValid, 143
iGoat, 178	openURL, 132–137
image list, 87	sourceApplication, 136
implementation, declaring, 16–17	UIActivity, 139–140
Info.plist, 33	UIPasteboard, 144
init, 19	universal links, 137–138
initialization vector (IV), 226–227	URL schemes, 132–133
initWithCoder, 21—22	CFBundleURLSchemes, 133
initWithContentsOfURL, 206	defining, 132–133
injection attacks, 199-207	hijacking, 136–137
cross-site scripting (XSS), 199–202	validating URLs and senders, 134
input sanitization, 200–201	iproxy command, 84
output encoding, 200–202	isContentValid, 143
displaying untrusted data, 202	IV (initialization vector), 226–227
predicate injection, 204–205	ivars, 15–17, 91
SQL injection, 203–204	
parameterized SQL, 203–204	J
SQLite, 203–204	jailbreak detection, 9–10
XML injection, 207	futility of, 9
XML external entities, 205–206	jailbreaking, 4, 9–10, 77
XPath, 207	JavaScript, 11
input sanitization, 200–201	executing in Cordova, 154–157
installipa command, 80	executing in UIWebView, 149–150
Installipa Command, 60	stringByEvaluatingJavaScriptFrom-
Instruments, 55–57	String, 149–150
integer overflow, 196–198	JavaScript-Cocoa bridging, 150–157
example, 197–198	JavaScriptCore, 150–154
preventing, 198	blocks, 150–151
interface, declaring, 15–16	JSContext, 152–154
interprocess communication, see IPC	JSExport, 151-152
(interprocess communication)	Jekyll, 12

just-in-time (JIT) compiler, 8–9, 149 JRSwizzle, 25 JSContext, 152–154 JSExport, 151–152 K KCFStreamSSLLevel, 129 Keychain API, 6–7, 113, 186, 211 backups, 212 iCloud synchronization, 219 kSecAttrAccessGroup, 218–219 protection attributes, 212–214 SecItemAdd, 214–215, 219 SecItemCopyMatching, 216 SecItemUpdate, 216 SecItemUpdate, 215 shared Keychains, 218–219 usage, 214–217 wrappers, 217–218 key derivation, 227–228 keylogging, 175–177 killall command, 79, 101 kSecAttrAccessGroup, 218–219 kSecAttrAccessible, 220 kSecAttrSynchronizable, 219	link identity editor (LDID), 97 lipo command, 78, 85 lldb, 62–81, 83–84, 191 backtrace (bt) command, 65–66 breakpoints, 62 actions, 70–72, 164 conditions, 72 enabling/disabling, 64 setting, 62–64 expr command, 69 frame select command, 66–67 frame variable command, 66 image list, 87 print object command, 67–68 llvm, 90 Local Authentication API, 231–232 Logos, 98 loopback interface, 46–47 Lua, 12 M M7 processor, 242 MAC (mandatory access control), 4–5 MAC address, 234 Mach-O binary format, 77, 85
L LAContext, 231–232 ldid command, 97 LDID (link identity editor), 97 legacy issues, from C, 189–198 buffer overflows, 193–196 example, 194–195 preventing, 195–196 format string attacks, 190–193 NSString, 192–193 preventing, 191–193 integer overflow, 196–198 example, 197–198 preventing, 198 libc, 8 Library directory, 35–37 Application Support directory, 35 Caches directory, 35–36, 187 Snapshots directory, 36 Cookies directory, 36 Preferences directory, 36 Saved Application State directory, 37 LIKE operator, 205	MachOView, 88 MacPorts, 94 malloc, 197–198 mandatory access control (MAC), 4–5 MATCHES operator, 205 MCEncryptionNone, 126 MCEncryptionPtional, 126 MCEncryptionRequired, 126 MCSession, 126 message passing, 13–15 method swizzling, 23–25 Mobile Safari, 44 MobileTerminal, 78 multipeer connectivity, 125–127 certificateHandler, 126 didReceiveCertificate, 126 encryption, 125–127 N netcat command, 78 networking, 107–129 AFNetworking, 122–124 certificate pinning, 123–124

backgroundSessionConfiguration, 117 CFStream, 48, 107, 128–129 ephemeralSessionConfiguration, 117 multipeer connectivity, 125–127 certificateHandler, 126 didReceiveCertificate, 126 encryption, 125–127 NSInputStream, 49 NSoutputStream, 49 NSOutputStream, 49 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108, 117 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HSURLResponse, 108 NSURLConnectionPelgate, 109 NSURLConnectionPelgate, 109 NSURLConnectionPelgate, 109 NSURLConnectionPelgate, 109 NSURLConnectionPelgate, 109 NSURLSession 122 URL loading system, 107–122 HTTP redirects, 113–114 NSURLSessionConfection, 48, 108 NSURLConnectionPelgate, 109 NSURLConnectionPelgate, 109 NSURLSession, 49 NSURLSession, 49 NSURLSession, 122 URL loading system, 107–122 SURLSessionDataTask, 18 NSURLSessionCartaTask, 18 NSURLSessionCartaTask, 18 NSURLSessionTaskDelegate, 119 SNSURLSessionTaskDelegate, 119 SNSURLSessionTaskDelgate, 119 SNSURSessionTaskDelgate, 119 SNSURLSessionTaskDelgate, 119 SNSURSessionTaskDelgate, 119 SNSURSessionTaskDelgate, 119 SNSURCedential, 120 SURLGenetialStorage, 108 SNURLSessionTaskDelgate, 119 SNSURCesentialStorage, 108 SNURLSessionTaskDelgate, 119 SNSURCesentialStorage, 108 SNURLSessionTaskDelgate, 119 SNSURLSessionTaskDelgate, 119	ASIHTTPRequest, 122, 124–125	NSURL, 188
CFStream, 48, 107, 128–129 ephemeralSessionConfiguration, 117 multipeer connectivity, 125–127 certificateHandler, 126 didReceiveCertificate, 126 encryption, 125–127 NSIRputStream, 49 NSOutputStream, 49 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnection, 48, 108 NSURLCedential, 120 NSURLCredential, 120 NSURLCredential, 120 NSURLCedentialStorage, 110–111 NSURLSessionConfiguration, 120–121 NSURLSessionConfiguration, 120–121 Surced URL credentials, 121–122 NSURLSessionConfiguration, 120–129 stored URL credentials, 121–122 NSCoder, 185–187 NSCoding, 21–22 NSCoder, 185–187 NSCoding, 21–22 NSSTata, 113 NSExtensionContext, 143 NSExtensionContext,	-	
ephemeralSessionConfiguration, 117 multipeer connectivity, 125–127 certificateHandler, 126 didReceiveCertificate, 126 encryption, 125–127 NSInputStream, 49 NSOutputStream, 49 NSOutputStream, 49 NSURLSession, 122 URL loading system, 107–122 HTTP pasic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnectionDelegate, 109 NSURLConnectionSpace, 109–111, 122 NSURLProtocol, 1,55 NSURLResponse, 108 NSURLSession, 48, 108 NSURLConnectionLegate, 109 NSURLConnectionDelegate, 109 NSURLSession, 122 URL loading system, 107–122 HTTP pasic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnectionDelegate, 109 NSURLSession, 48, 107–122 NSURLSession, 48, 108 NSURLSession, 48, 107 NSURLSessionTaskDelegate, 119 SSURLSessionTaskDelegate, 119 SSURLSessionTaskDelegate		
multipeer connectivity, 125–127 certificateHandler, 126 didReceiveCertificate, 126 encryption, 125–127 NSInputStream, 49 NSoutputStream, 49 NSOutputStream, 49 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLCredential, 120 NSURICredential, 120 NSURICredential, 120 NSURICredential, 120 NSURICredential, 120 NSURICredentialstorage, 110–111 NSURIResponse, 108 NSURICredentialstorage, 110–111 NSURIResponse, 108 NSURICredentialstorage, 119 sharedCredentialstorage, 119 sharedCredentialstorage, 119 SharedCredentialstorage, 119 SharedCredentialstorage, 119 SharedCredentialstorage, 119 SharedCredentialstorage, 109 NSURICredential, 120 NSURICredential, 120 NSURICredentials, 120 NSURICredentials, 120 NSURICredentials, 120 NSURICredentials, 120 NSURICredentials, 140 NSURICredentials, 141 NSURICredentials, 142 NSURICredentials, 148 NSURICredentials, 149 NSURICredentialstorage, 109–111, 122 NSURICredentials, 148 NSURICredentialstorage, 109–111, 122 NSURICredentialstorage, 109–111, 122 NSURICredentialstorage, 109–111, 129 NSURICredentialstorage, 108 NSURICredentialstorage, 109–111, 129 NSURICredentialstorage, 109–111, 129 NSURICredentialstorage, 109–111, 129 NSURICredentialstorage, 109–111, 129 NSURICredentialstorage, 109–111, 1720 NSURICredentialstorage, 109–111, 1720 NSURICredentialstorage, 108 NSURICredentialstorage, 108 NSURICredentialstorage, 109 NSURICredentialstorage, 109 NSURICredentialstorage, 108 NSURICredentialstorage, 109 NSURICredentialstorage, 109 NSURICredentialstorage, 109 NSURICredentialstorage, 109 NSURICredentialstorage, 108 NSURICredentialstorage, 109 NSURICredentialstorage, 109 NSURICre		
certificateHandler, 126 didReceiveCrtificate, 126 encryption, 125–127 MSInputStream, 49 NSOutputStream, 49 NSURLession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnectionDelegate, 109 NSURLCredentialStorage, 110–111 NSURLRequest, 108 NSURLSession (A8, 117 NSURLSession (A8, 117-122 NSUMLParser, 205–206 Objective-C, 13–25 blocks declaring, 18 exposing to JavaScript, 150–151 categories, 22–23 code structure, 15–17 delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odctools, 78, 84 OpenSSL, 94, 228–229 openssl command, 138 openWRL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P p12 file, 113 parameterized SQL, 203–204		
didReceiveCertificate, 126 encryption, 125–127 NSInputStream, 49 NSoutputStream, 49 NSStream, 48, 107, 127–128 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLCredential, 120 NSURLCredential, 120 NSURLCredential, 120 NSURLRequest, 108 NSURLResponse, 108 NSURLCredential, 120 NSURLCredential, 120 NSURLSessionConfiguration, 120–121 NSURLSessionConfiguration, 120–121 NSURLSessionConfiguration, 120–122 Stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPRequest, 122 NSINLResponse, 108 NSURLSessionConfiguration, 120–121 value disabling, 163 NSURSursesionContext, 143 NSFileManager, 221–223 NSHTTPRequest, 109 NSURLSessionConfiguration, 17–119 NSURSessionConfiguration, 120 Objective-C, 13–25 blocks declaring, 18 exposing to JavaScript, 150–151 categories, 22–23 code structure, 15–17 delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSL, 94, 228–229 opensSL command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P NSURAuthenticationMethodClient-	· · · · · · · · · · · · · · · · · · ·	
encryption, 125–127 NSInputStream, 49 NSOutputStream, 48, 107, 127–128 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLCredential, 120 NSURLCredential, 120 NSURLCredential, 120 NSURLRequest, 108 NSURLResponse, 108 NSURLResponse, 109 NSURLCredential, 120 NSURLCredential, 120 NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 Stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSExtensionContext, 143 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPRequest, 122 NSHTIPRequest, 108 NSURLSessionTaskDelegate, 119 sharedCredentials, 121–122 NSExtensionContext, 143 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPRequest, 108 NSURLSessionConfiguration, 120 Objective-C, 13–25 blocks declaring, 18 exposing to JavaScript, 150–151 categories, 22–23 code structure, 15–17 delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSI, 94, 228–229 opens		<u> </u>
NSInputStream, 49 NSOutputStream, 49 NSStream, 48, 107, 127–128 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLCredential, 120 NSURLCredential, 120 NSURLCredentialstorage, 110–111 NSURLSession(A8, 117 NSURLSession(A8, 117 NSURLSession(Configuration, 120–121 NSURLSession(TaskDelegate, 119 sharedCredentialStorage, 120–122 Stored URL credentials, 121–122 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionItem, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPRequest, 108 NSURLSession, 48, 117–122 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 100–111 delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSH, 78 OpenSSH, 78 OpenSSH, 78 OpenSSH, 78, 228–229 opensal command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P NSURLProteccio, 155 NSURLResponse, 108 NSURLResponse, 108 NSURLSession data 149 NSURLSessionTaskDelegate, 119 NSURLSessionTas		
NSOutputStream, 49 NSStream, 48, 107, 127–128 NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HSURLConnection, 48, 108 NSURLConnection, 48, 108 NSURLConnection of the system of the sys	, -	NSURLProtectionSpace, 109–111, 122
NSStream, 48, 107, 127–128 NSURL Session, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnection, 48, 108 NSURLCredential, 120 NSURLCredential, 120 NSURLResponse, 108 NSURLCredentialstorage, 110–111 NSURLResponse, 108 NSURLSession, 48, 117 NSURLSession, 48, 117 NSURLSession, 48, 117 NSURLSession, 48, 117 NSURLSession, 48, 108 NSURLSession, 48, 108 NSURLCredentialstorage, 109 NSURLCredentialstorage, 110–111 NSURLSession, 48, 117 NSURLSessionTaskDelegate, 119 SSMRLSession, 48, 117 NSURLSessionTaskDelegate, 119 NSURLSessionTaskDelegate, 119 NSURLSession, 48, 117 NSURLSessionTaskDelegate, 119 NSURLSessionTa	·	
NSURLSession, 122 URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnectionDelegate, 109 NSURLCredential, 120 NSURLCredentialStorage, 110–111 NSURLSessionConfiguration, 120–121 NSURLSessionConfiguration, 120–121 Stored URL credentials, 121–122 Stored URL credentials, 121–122 Notification Center, 224–225 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionContext, 143 NSExtensionContext, 143 NSExtensionContext, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPCookieStorage, 237 NSHTPRequest, 122 NSIngufStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURLResponse, 108 NSURLResponse, 108 NSURLSessionConfiguration, 117–119 NSURLSessionConfiguration, 117–119 NSURLSessionTask belegate, 119 NSURSessionTask belegate, 119 NSURSessionTask belegate, 119 NSURSessionTask belegate, 119 NSURSessionTask belegate, 119 NSURLSessionTask belegate, 119 NSURSessionTask belegate, 119 NSURLSessionTask belegate, 12		
URL loading system, 107–122 HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnectionDelegate, 109 NSURLCredential, 120 NSURLCredential, 120 NSURLRequest, 108 NSURLSessionCaskDelegate, 110–111 NSURLResponse, 108 NSURLSessionTaskDelegate, 119 SSURLSessionTaskDelegate, 119 NSURLSessionTaskDelegate, 119 NSURLerailts, 36, 37, 178 NSURLParser, 205–206 Objective-C, 13–25 blocks declaring, 18 exposing to JavaScript, 150–151 categories, 22		
HTTP basic authentication, 110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnection, 48, 108 NSURLCredential, 120 NSURLCredential, 120 NSURLSession at 100–111 NSURLResponse, 108 NSURLSession at 119 SharedCredentialstorage, 119 SharedCredentialstorage, 119 SharedCredentialstorage, 119 SharedCredentialstorage, 119 SharedCredentialstorage, 120–122 Stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 129 NSOrperdicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-		·
110–111, 119–121 HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnectionDelegate, 109 NSURLCredential, 120 NSURLCredentialStorage, 110–111 NSURLSession, 48, 117 NSURLSession, 48, 107 NSUMParser, 205–206 Objective-C, 13–25 blocks declaring, 18 exposing to JavaScript, 150–151 categories, 22–23 code structure, 15–17 delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSL, 94, 228–229 openSUR, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 NSURAuthenticationMethodClient-	· .	
HTTP redirects, 113–114 NSURLConnection, 48, 108 NSURLConnection, 48, 108 NSURLConnectionDelegate, 109 NSURLCredential, 120 NSURLCredentialStorage, 110–111 NSURLRequest, 108 NSURLSession, 48, 117 NSURLSessionTaskDelegate, 119 SNURLSessionTaskDelegate, 119 SharedCredentialStorage, 120–122 Stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionContext, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookiestorage, 237 NSHTIPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-		
NSURLConnection, 48, 108 NSURLConnectionDelegate, 109 NSURLCredential, 120 NSURLCredential, 120 NSURLCredential, 120 NSURLRequest, 108 NSURLResponse, 108 NSURLSession, 48, 117 NSURLSession, 48, 117 NSURLSession taskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionItem, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOperation, 122 NSOperation, 122 NSOperation, 129 NSOperation, 129 NSOperation, 129 NSStream, 48, 107, 127–128 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-		NSURLSessionTaskDelegate, 119
NSURLConnectionDelegate, 109 NSURLCredential, 120 NSURLCredential, 120 NSURLCredentialStorage, 110–111 NSURLResponse, 108 NSURLSession, 48, 117 NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionTem, 143 NSExtensionTem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNottificationCenter, 224–225 NSOperation, 122 NSOperation, 122 NSOperation, 122 NSOperation, 129 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-		
NSURLCredential, 120 NSURLCredentialStorage, 110–111 NSURLRequest, 108 NSURLSesponse, 108 NSURLSession, 48, 117 NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOtream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-		
NSURLRequest, 108 NSURLResponse, 108 NSURLSession, 48, 117 NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-		NSXMLParser, 205-206
NSURLResponse, 108 NSURLSession, 48, 117 NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- Objective-C, 13–25 blocks declaring, 18 exposing to JavaScript, 150–151 categories, 22–23 code structure, 15–17 delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSL, 94, 228–229 openSSL, 94, 228–229 openSSL command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P p12 file, 113 parameterized SQL, 203–204	NSURLCredentialStorage, 110-111	
NSURLSession, 48, 117 NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-	NSURLRequest, 108	0
NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOperation, 122 NSOperation, 122 NSOperation, 122 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSURAuthenticationCenter, 24, 119 sharedCredentials, 119 exposing to JavaScript, 150–151 categories, 22–23 code structure, 15–17 delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSI, 94, 228–229 opensSI command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P 12 file, 113 parameterized SQL, 203–204	NSURLResponse, 108	Obi
NSURLSessionConfiguration, 120–121 NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOperation, 122 NSOperation, 122 NSOperation, 122 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-	NSURLSession, 48, 117	•
NSURLSessionTaskDelegate, 119 sharedCredentialStorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-	NSURLSessionConfiguration,	
sharedCredentialStorage,	120–121	
shareucteucteutclastorage, 120–122 stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSH, 78 OpenSSL, 94, 228–229 openSSL command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 output encoding, 200–202 NSURAuthenticationMethodClient-	${\tt NSURLSessionTaskDelegate},119$	
stored URL credentials, 121–122 Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- delightfulness of, 13 garbage collection, 18 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 openss1 command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P p12 file, 113 parameterized SQL, 203–204	sharedCredentialStorage,	9
Notification Center, 224–225 NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- RSCoding, 185 implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSL, 94, 228–229 openSSL, 94, 228–229 openSSL command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P p12 file, 113 parameterized SQL, 203–204	120–122	
NSCoder, 185–187 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- implementation, declaring, 16–17 ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 openSSL, 94, 228–229 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P NSURAuthenticationMethodClient-		9
ivars, 15–16 NSCoding, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- ivars, 15–16 message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 opensl command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P NSTring, 192–193, 195, 202 NSURAuthenticationMethodClient-	Notification Center, 224–225	9 9
NSCOUING, 21–22 NSData, 113 NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- message passing, 14–15 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 openSL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-	NSCoder, 185-187	
NSExtensionContext, 143 NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSExtensionContext, 143 private methods, lack thereof, 16 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 opensSl command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-	NSCoding, $21-22$	
NSExtensionItem, 143 NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSExtensionItem, 143 property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 openss1 command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P NSStream, 48, 107, 127–128 NSURAuthenticationMethodClient- property synthesis, 17 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 opensSL, 94, 228–229 opensSL, 94, 228–229 opensSL, 94, 228–229 openSL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P NSString, 192–193, 195, 202 NSURAuthenticationMethodClient-	NSData, 113	
NSFileManager, 221–223 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSFileManager, 221–223 reference counting, 18–19 odcctools, 78, 84 OpenSSH, 78 OpenSSL, 94, 228–229 openss1 command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P p12 file, 113 parameterized SQL, 203–204	${\tt NSExtensionContext},143$	
NSFITEMATAGER, 221–225 NSHTTPCookieStorage, 237 NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- odcctools, 78, 84 OpenSSL, 94, 228–229 opensSL command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P p12 file, 113 parameterized SQL, 203–204	NSExtensionItem, 143	1 1 , ,
NSHTTPRequest, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- OpenSSH, 78 OpenSSH, 78 OpenSSH, 78 OpenSSL, 94, 228–229 openss1 command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P P NSStream, 48, 107, 127–128 NSURAuthenticationMethodClient- P p12 file, 113 parameterized SQL, 203–204	NSFileManager, 221-223	O .
NSITPREQUEST, 122 NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSInputStream, 49 openSSL, 94, 228–229 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P		
NSInputStream, 49 NSLog, 95, 161–164, 192 disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSInputStream, 49 openSsl command, 138 openURL, 132–137 otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P p12 file, 113 parameterized SQL, 203–204	NSHTTPRequest, 122	-
disabling, 163 NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSLORAUTH		1 100
NSNotificationCenter, 224–225 NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- otool, 53, 78, 84–86, inspecting binaries, 90–92 output encoding, 200–202 P p p p p12 file, 113 parameterized SQL, 203–204		•
NSOperation, 122 NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSNOR inspecting binaries, 90–92 output encoding, 200–202 P p12 file, 113 parameterized SQL, 203–204		
NSOutputStream, 49 NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- NSURAuthenticationMethodClient- Output encoding, 200–202 P p12 file, 113 parameterized SQL, 203–204		
NSPredicate, 204–205 NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- P p12 file, 113 parameterized SQL, 203–204	•	1 0
NSStream, 48, 107, 127–128 NSString, 192–193, 195, 202 NSURAuthenticationMethodClient- P p12 file, 113 parameterized SQL, 203–204	•	output encouning, 200 202
NSString, 192–193, 195, 202 p12 file, 113 NSURAuthenticationMethodClient- parameterized SQL, 203–204		D
NSURAuthenticationMethodClient- parameterized SQL, 203–204		
	-	
Certiticate, 112 pasteboardDB file, 165–167		
	Certiticate, 112	pasteboardDB file, 165–167

pasteboards, 164–169 canPerformAction, 168 disabling copy/paste, 168–169 pasteboardDB file, 165–167 pasteboardWithUniqueName, 165–167 UISearchBar, 165 pasteboardWithUniqueName, 165–167 PhoneGap, 11, 150 physical attackers, 161 PIE (position-independent executable), 53–54 removing, 87 plist files, 29–31	privacy policies, 247–248 proximity tracking, 244–247 requesting permission, 243 unique device identifier (UDID), 233–235 advertisingIdentifier, 235 identifierForVendor, 234 NSUUID, 234 uniqueIdentifier, 234 private methods, 16 property synthesis, 17 protocols, 20–22 declaring, 21–22
converting, 30–31 XML, 29–30 plutil command, 30–31	proximity tracking, 244–247 proxy setup, 43–50
popen, 10	Q
position-independent executable (PIE), 53–54 removing, 87	Quick Look, 35, 68 QuickType, 177
predicate injection, 204–205	D
LIKE operator, 205	R
MATCHES operator, 205	reference counting model, 18–19
wildcards, 204–205	retain and release, 18–19
predicates, 205	references, strong and weak, 19
predicateWithFormat, 204–205	release, 18–19
Preferences directory, 36 printf command, 87, 190–192	remote device wipe, 5, 6
print object command, 67–68	removeAllCachedResponses, 75
privacy concerns, 233–248	respringing, 79, 101 restorationIdentifier, 184–185
advertisingTrackingEnabled, 235	retain, 18–19
bluetooth low energy (BTLE), 244	return-to-libc attack, 8
cookies, 237–238	RNCryptor, 186, 230
Do Not Track, 236–237	rootViewController, 183
geolocation, 238–240	rsync command, 78
accuracy, 239	
CLLocationManager, 240	S
locationManager, 244	safe string APIs, 195
risks, 238–239 GPS, 238	Sandbox, 4–5
HealthKit, 240–241	Saved Application State directory, 37
iBeacons, 244–247	Seatbelt, 4–5
CBPeripheralManager, 246	SecCertificateRef, 112–113
${\tt CLBeaconRegion,244-246}$	SecIdentityRef, 112–113
CLLocationManager, 244	SecItemAdd, 186, 212, 215, 219
startMonitoringForRegion, 244	SecItemCopyMatching, 216
M7 processor, 242	SecItemDelete, 216 SecItemUpdate, 215
MAC address, 234	SecRandomCopyBytes, 227
microphone, 233	SecTrustRef, 112–113

C D4	
Secure Boot, 4	strcat, 195
SecureNSCoder, 186–187	strcpy, 194, 195
securityd, 7	stringByEvaluatingJavaScriptFrom-
serialization, 21	String, 149-150
setAllowsAnyHTTPSCertificate, 108	strlcat, 195–196
setJavaScriptCanOpenWindows-	strlcpy, 195–196
Automatically, 159	strong references, 19
setJavaScriptEnabled, 159–160	stunnel, 46
setResourceValue, 188	subclassing, 23
setSecureTextEntry, 175–177	synthesize, 17
setShouldResolveExternal-	syslog, 162, 190
Entities, 206	_
Shared directory, 37	T
sharedCredentialStorage, 120–122	task_for_pid-allow, 82
sharedHTTPCookieStorage, 237	tcpdump command, 78
shared Keychains, 218–219	tcpprox, 49–50
shouldAllowExtensionPoint-	TCP proxying, 49–50
Identifier, 143	test devices, 42
should messages, 20	text segment, 85–86
shouldSaveApplicationState, 20	Theos, 97–98
shouldStartLoadWithRequest, 148	thin binaries, 85
sideloading, 77–80	ThisDeviceOnly, 212
signed integer, 196	TLS (Transport Layer Security),
signedness, 51, 196	108–119, 127–129
Simulator, 43–46	BEAST attack, 118
camera, 43	bypassing validation, 44–47, 119
case-sensitivity, 43	certificate pinning, 114–117,
installing certificates, 44	123–124
Keychain, 43	CRIME attack, 118
PBKDF2, 43	mutual authentication, 112–113
proxying, 44–46	setAllowsAnyHTTPSCertificate, 108
trust store, 44	validation, category bypasses, 22
SpringBoard, 79	
SQL injection, 201, 203–204	tmp directory, 37, 80, 187 Today screen, 131
parameterized SQL, 203-204	TOFU (trust on first use), 127
SQLite, 203–204	TouchID, 231–232
SSH, 28, 82	LAContext, 231–232
SSL, see TLS (Transport Layer	
Security)	Transport Layer Security, see TLS
SSL Conservatory, 115–117	(Transport Layer Security)
SSL Killswitch, 96–97	Tribbles, 51
stack, 8, 53-54, 190, 193	trust on first use (TOFU), 127
$\operatorname{startMonitoringForRegion}, 244$	tweaks, Cydia Substrate, 97
state preservation, 184–187	
leaks, 184–185	U
restorationIdentifier, $184 – 185$	UDID (unique device identifier),
secure, 185–187	233–235
static analysis, 54	advertisingIdentifier, 235
std::string, 195	identifierForVendor, 234
	, , , , , , , , , , , , , , , , , , , ,

UDID (unique device identifier),	user preferences, 178
continued	UUID, 27
NSUUID, 234	uuidgen, 244
uniqueIdentifier, 234	W
UIActivity, 139–140	V
UIAlertView, 183	Valgrind, 55
UI Layers, 182–183	vbindiff command, 78, 88
UIPasteboardNewsFind 165	vfork, 10
UIPasteboardNameFind, 165	.vimrc file, 30
UIPasteboardNameGeneral, 165	vmaddr, 88
UIRequiredDeviceCapabilities, 34	
UIResponderStandardEditActions, 169	W
UISearchBar, 165, 175	
UITextView 175	wardriving, 238
UITextView, 175 UIView, 182-183	warning policies, 51
UIWebView, 200, 201	watchdog, 58–59
	watchmedo command, 58–59
UIWindow, 182–183 unique device identifier (UDID),	weak_classdump, 93
233–235	weak references, 19
advertisingIdentifier, 235	web apps, 147–160
identifierForVendor, 234	WebViews, 9, 147–160
NSUUID, 234	Cordova, 154–157
uniqueIdentifier, 234	risks, 156
uniqueIdentifier, 234	XmlHttpRequest, 155
universal links, 137–138	JavaScript, 149
unsigned integer, 196	executing in Cordova, 154–157
URL loading system, 107	executing in UIWebView, 149–150 stringByEvaluatingJavaScriptFrom-
credential persistence types, 111	String, 149–150
HTTP basic authentication, 110–111	JavaScript–Cocoa bridging, 150–157
HTTP redirects, 113–114	JavaScriptCore, 149–154
NSURLConnection, 108	blocks, 150–151
NSURLConnectionDelegate, 109	JSContext, 152–154
NSURLCredential, 120	JSExport, 151–152
NSURLCredentialStorage, 110-111	just-in-time (JIT) compiler, 149
NSURLRequest, 108	Nitro, 148, 149
NSURLResponse, 108	NSURLRequest, 148–149
NSURLSession, 117-122	UIWebView, $147-150$
NSURLSessionConfiguration, $117 – 119$	WebKit, 11, 147–148
NSURLSessionTaskDelegate, 119	WKWebView, see WKWebView
${\it sharedCredentialStorage},120122$	whitelisting, 149, 152, 200-201
stored URL credentials, 121-122	will messages, 20
URL schemes, 132–133	willSendRequestForAuthentication-
${\it CFBundleURLSchemes}, 133$	Challenge, 112
defining, 132–133	Wireshark, 46
hijacking, 136–137	WKPreferences, 160
validating URLs and senders, 134	WKWebView, $148\ 158 - 160$
USB, TCP proxying, 84	${\it addUserScript}, 159$
usbmuxd command, 84	benefits of, 159–160

 $\begin{array}{l} {\rm didFinishNavigation,\ 159-160}\\ {\rm hasOnlySecureContent,\ 159-160}\\ {\rm setJavaScriptCanOpenWindows-}\\ {\rm Automatically,\ 159}\\ {\rm setJavaScriptEnabled,\ 159-160}\\ {\rm WKPreferences,\ 160}\\ {\rm WKUserScript,\ 159}\\ {\rm WKWebViewConfiguration,\ 160} \end{array}$

X

xcodebuild, 190
Xcode setup, 50–53, 55
warnings, 51–53
Xcon, 10
XML injection, 207
NSXMLParser, 205–206
XML external entities, 205–206
XPath, 207
XN (eXecute Never), 8–9
XPath, 207
XSS (cross-site scripting), 199–200
input sanitization, 200–201
output encoding, 201–202
xxd command, 88