

What's New in iPhone OS 3.0

Frank Szczerba
AppMobi

A Bit About Me

- Drexel Alumni, BS ECE, Class of '98
- Developing embedded and UNIX kernel software professionally since 1994 (SunOS, Solaris, VxWorks, Linux, NetBSD, etc)
- Before starting AppMobi, I was writing an object-based filesystem for Wasabi Systems (RIP)
 - Wasabi used Mac desktops and laptops to develop NetBSD-based appliances used by Linux and Windows hosts
 - I realized how much better Macs had become since System 7 and 68030's
- When Wasabi folded, I took the opportunity to jump into iPhone development in partnership with Wellspring FV in Lancaster (the people behind Flycast)

What's Changed in 3.0?



What's Changed in 3.0?

- A lot!
- We'll try to hit the highlights at a high level
- There should be something for everyone doing iPhone development (or thinking about it)
- Ask questions as we go, tell me if you want more detail or want to move on
- API change details at <http://developer.apple.com/iphone/library/releasenotes/General/iPhone30APIDiffs/index.html>

Push Notifications

- Text alerts, sound alerts, and numeric badges
- New methods in UIApplicationDelegate protocol
 - `-[UIApplicationDelegate application:didFinishLaunchingWithOptions:]`
- Only one queued notification
 - Can't assume all notifications are delivered
 - Your protocol must be stateless
- 256 byte JSON message

- Example messages:

```
{ "aps" : { "badge" : 1 } }
```

```
{ "aps" : { "sounds": "file.aiff" } }
```

```
{ "aps" : { "alert" : "a message" } }
```

```
{  
  "aps" : {  
    "alert" : {  
      "loc-key" : "MSG_POSTED"  
      "loc-args" : [ "Jen", "iPhone" ]  
      "action-loc-key" : "PLAY_KEY"  
    }  
  }  
  "acme1" : "conversation1994"  
}
```

Push Server Side

- Get X.509 cert from Apple
- App sends unique ID to your server; identifies both the device and application
- Open an SSL connection to the Apple push service and keep it open
 - Multiple connections from a single server may be considered DoS
 - Can use multiple connections if you have multiple servers
 - Apple will close the connection for invalid data format or messages >256 bytes
 - Low activity connections may timeout in TCP/IP layer
- Compact streaming binary message format, no acknowledgements
- Make periodic connections to uninstall notification service (same SSL cert, different host)
 - Connection initiates reply, server sends IDs of uninstalled instances, then disconnects
- Sample code on the forums in many languages (Ruby, Python, PHP, etc)

Cut, Copy, and Paste

- UIPasteboard with support for system and custom types
- Support for multiple data representations
- Support for multiple pasteboards
- Automatic support in UITextField, UITextView, and UIWebView
- Support in custom views with UIMenuController

Accessory Support

- Connect using the dock connector or Bluetooth
- Separate paid program for hardware manufacturers

In App Purchase Support

- New StoreKit framework
- Price points are the same as for apps (\$0.99, \$1.99, etc)
- Only allowed in paid apps
- StoreKit handles financial transaction, app handles download or unlock
- Must support re-download/unlock of purchased content

Peer to Peer Support

- GameKit framework adds simple interface on top of Bonjour and Bluetooth
- GKPeerPickerController provides a standard lobby UI
 - You can bypass this, but only GKPeerPickerController can turn on Bluetooth if it is switched off on Settings
 - Allows user to select an Internet connection, but you must handle that manually
- GKSession manages the session and data transfer
 - Server, Client, or Peer
 - Up to 1 outgoing and 3 incoming connections
 - Reliable or Unreliable data transmission
 - Recommend <1 kByte packets, support for up to 95 kByte with fragmentation and reassembly

Voice Chat

- Part of GameKit framework
- GKVoiceChatService uses GKVoiceChatClient protocol to transfer data
- If using GKSession, the GKVoiceChatClient implementation can just bridge between GKSession and GKVoiceChatService

MapKit

- New MapKit framework allows you to embed maps directly in your application
- Provides a scrollable map view that can be annotated with custom information
- Many new classes, including MKMapView, MKAnnotationView, MKReverseGeocoder, and MKUserLocation

iPod Library Access

- New classes and protocols in the MediaPlayer framework
- What you can do:
 - Play items from the user's library
 - Queue multiple items for playback
 - Search the user's audio library
 - Access the user's playlists, including smart, on-the-go, and genius playlists
- What you can't do:
 - Access the audio stream in any way
 - No filtering, advanced metering, etc
- Two types of MPMusicPlayerController:
 - applicationMusicPlayer is local to your app, does not see iPod State
 - iPodMusicPlayer interacts with the iPod app, music keeps playing when your app exits

Audio Recording

- New `AVAudioRecorder` class works with `AVAudioRecorderDelegate` to manage recording
- `AVAudioSession` works with `AVAudioSessionDelegate` to
 - manage audio context (audio category, sample rate, buffering)
 - respond to interruptions
- New constants for recording formats, audio encoding, and sample rate conversion

Core Audio

- Support for software decode of MP3 and AAC allows mixing these file types
- Audio Toolbox interfaces for querying playback capabilities
- Support for registering audio units and connecting audio unit processing graphs
- New audio formats
 - DVI/Intel IMA ADPCM
 - Microsoft GSM 6.10
 - AES3-2003

Streaming Video and Audio

- MPMoviePlayerController now supports http streaming video and audio
- Video formats
 - MPEG-2 transport streams or program streams
 - H.264 video (baseline level 3.0)
 - HE-AAC or AAC-LC audio (up to 48 kHz, stereo)
- Audio Formats
 - MPEG-2 transport, program, or elementary streams, or
 - HE-AAC or AAC-LC files with ADTS headers, or
 - MP3 Files
- Supports live broadcast and video-on-demand use cases
- Supports AES-128 encryption and key rotation

Core Data

- New (to the iPhone) CoreData.framework
- Uses SQLite for backing store
- NSFetchedResultsController simplifies use with table views
- Managed undo/redo
- Support for validation
- Support for change propagation and managing relational consistency
- Support for grouping, filtering, and organizing data in memory

In App Email

- New MessageUI framework
- Provides MFMailComposeViewController
 - normally presented modally
 - Uses MFMailComposeViewControllerDelegate protocol to dismiss
- Support for composing and queuing email messages into the user's outbox
- Can pre-set recipients (To, CC, BCC), subject, body content, and attachments before presenting to the user
- Can't change fields after presenting to the user

Safari Features

- Support for the <audio> and <video> tags
- Support for the Geolocation JavaScript Classes
- Faster rendering
- Faster JavaScript execution

Shared Keychain Items

- Can now share keychain items across your applications
- Add an Entitlements property list to your app bundle and point to it with the `CODE_SIGN_ENTITLEMENTS` Xcode build variable
 - Top-level key `keychain-access-groups` is an array of strings naming the groups your app belongs to
 - The app identifier is treated as the last item in this list
- Call `SecAddItem` with a `kSecAttrAccessGroup` key in the attributes dictionary naming the shared group to access
 - If this key is not present, the first entry in the `keychain-access-groups` array is used

Accessibility Support

- New User Accessibility features (hardware dependent):
 - Full-screen zoom
 - Inverted colors
 - Mono audio
 - Speak typed text
 - Voice control
 - VoiceOver
- Developers' main concern is VoiceOver
 - Add descriptions to interface elements through UIKit or IB
 - Read **Accessibility Programming Guide for iPhone OS** for more details

More Stuff

- Compass support
 - 3GS only
 - Accessed through Core Location framework
 - `-[CLLocationManager startUpdatingHeading]`
 - `-[CLLocationManager stopUpdatingHeading]`
 - `-[CLLocationManagerDelegate locationManager:didUpdateHeading:]`
 - `-[CLLocationManagerDelegate locationManagerShouldDisplayHeadingCalibration:]`
- OpenGL ES 2.0
 - 3GS only
 - Fragment and vertex shaders

UIViewController

- One-step view rotations
 - `-[UIViewController willAnimateRotationToInterfaceOrientation:duration:`
- Flip and cross-fade view transitions
- Alternate landscape view support
- Full-screen layout
- Autorotation support when in a UINavigationController
 - All views in the stack must support the proposed orientation

UITableView

- Finer control over reloading (by index path or by section)
- Customizable Delete button
- UILocalizedIndexCollation for localized sorting and section grouping
- Improved UITableViewCell class

UITableViewCell

- New cell types
 - UITableViewCellStyleDefault
 - UITableViewCellStyleSubtitle
 - UITableViewCellStyleValue1
 - UITableViewCellStyleValue2
- Direct access to the label and image views
 - .textLabel, detailLabel, and imageView
 - Enables setting properties (such as lineBreakMode) that were not accessible in 2.x



UINavigationController

- per-view toolbar items through `UIViewController.toolbarItems` property
- Direct access to the toolbar (and nav bar)
- `setToolbarHidden:animated:`
- `setViewControllers:animated:`
 - Supports changing the entire navigation stack at once
 - Use at launch time to restore state

UIScrollView

- Adjustable deceleration rate (fast or normal)
- Query and set zoom scale with animation
 - `-[UIScrollView setZoomScale:animated:]`
- Zoom to rect
 - `-[UIScrollView zoomToRect:animated:]`
- Nest scroll views within scroll views
 - Intended for orthogonal views
 - Great example in 3.0 AppStore app

Other UIKit Enhancements

- Shake events
- Access to battery state and proximity sensor through UIDevice
- Video capture through UIImagePickerController
- New UISearchDisplayController class for search results
- Stretchable content in UIView, 3- or 9-part
- New data detectors in UITextView and UIWebView
 - Configurable detection for phone numbers, URLs, and addresses
- Preview support in UIWebView for RTF, RTFD, PDF, iWork, and Office documents

Summary

- There are a lot of changes in 3.0, both end-user visible and “under the hood” changes that make our lives as developers easier
- Apple is listening to change requests, many of the changes make things that were at best merely possible in 2.x easy in 3.0
- Keep filing those bug reports and feature requests with Apple to help the SDK continue to improve