

# IOS Mobile Operating System

- Initially released in june 2007
- Programmed in Objective C and Swift.
- Derived from Mac os X
- Developed for iPhone and extended to iPod Touch, iPad, iwatch and Apple TV.
- The Kernel Type is Hybrid Kernel Architecture.





# The iOS Architecture

- Similar to basic architecture found in Mac OS X.
- Acts intermediate between applications and hardware.





# The Layers in iOS Architecture Technology

## Consists of four Abstraction layers

- Core OS Layer
  - Core service Layer
  - The Media Layer
  - The Cocoa Touch Layer
- 
- **Uses Darwin foundation and therefore a unix like OS**
  - **The user interface of iOS is based on the concept of direct manipulation, using multi-touch gestures.**



## Why iOS App Development?

- iOS is an Operating System - It's a subset of Mac OS X.
- The iOS SDK (Software Development Kit) that allow application programs to utilise classes and frameworks provided by the SDK. This class is focus on iOS SDK.
- iOS is a multitasking and runs on several different devices (iPod touch, iPhone, iPad, Apple TV and Apple Watch)
- Apple provides an IDE called Xcode.



## Applications



## Cocoa Touch

## Media

## Core Services

### Security Services

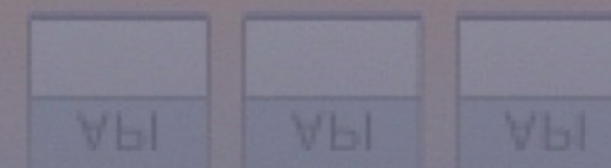
API

API

API

## Core OS

## Core OS



security services





## The core of iOS

Contains the low-level features such as

Accelerate Framework (Accelerate.framework)

This framework contains interfaces for performing DSP, linear algebra, and image-processing calculations

Core Bluetooth (CoreBluetooth.framework)

This framework allows developers to interact specifically with Bluetooth Low-Energy ("LE") accessories

External Accessory Framework  
(ExternalAccessory.framework)

This framework provides support for communicating with hardware accessories attached to an iOS based device



## Core services Layer

Contains the High-level features that all applications use such as

iCloud Storage

lets your application write data to a central location and access those items from all user's computers and iOS devices

Core services framework

Includes Accounts.framework, AddressBook.framework and CoreData.framework for user accounts ,contacts and for managing model-view-controller application



iCloud



## Media Layer

The Media layer contains the graphics, audio, and video technologies

### Graphics Technologies

Includes Core Graphics , Core Animation and OpenGL technologies which handles 2D vector and animating views and 2D and 3D figures

### Audio Technologies

Supports rich audio experince and audio formats like AAC, Apple Lossless(ALAC),A-Law and Linear PCM

### Video technologies

The iOS support the playback of movie files with the .mov, .mp4, .m4v, and .3gp filename extensions



# Cocoa Touch Layer

The **Cocoa Touch** layer contains the key **frameworks** for building **iOS** applications

The layer defines the basic application and support for key technologies such as **multitasking**, **touch-based input**, **push notifications**, and many **high-level system** services

Cocoa Touch follows a **Model-View-Controller (MVC)** software architecture





# iOS Version History

On June 29, 2007, Apple released the first version of iOS

- iOS 1.x: initial OS
- iOS 2.x: second major OS
- iOS 3.x: third major OS
- iOS 4.x: fourth major OS
- iOS 5.x: fifth major OS
- iOS 6.x: sixth major OS
- iOS 7.x: seventh major OS
- iOS 8.x: eighth major OS
- iOS 9.x: ninth major OS



The Latest Stable release is version 16.0 (Build 9A406) for iPhone SE to All iPhones



## iOS FEATURES

The power of iOS can be felt with some of the following features provided as a part of the device.

- Maps
- Siri
- Facebook and Twitter Multi-Touch Accelerometer
- GPS
- High end processor Camera
- Safari
- Powerful APIs
- Game center
- In-App Purchase Reminders
- Wide Range of gestures

The number of users using iPhone/iPad has increased a great deal. This creates the opportunity for developers to make money by creating applications for iPhone and iPad the Apple's App Store.

For some one new to iOS, Apple has designed an application store where the user can buy apps developed for their iOS devices. A developer can create both free and paid apps to App Store. To develop applications and distribute to the store, the developer will require to register with iOS developer program which costs \$99 a year and a Mac with Mountain Lion or higher for its development with latest Xcode.



# The iOS Development

## The iOS SDK (Software Development kit)

- Includes interfaces, tools and resources
- Includes special packages called Frameworks
- **A** framework is a directory that contains a dynamic shared library and the resources (such as header files, images, helper applications, and so on)

## Key Components of SDK

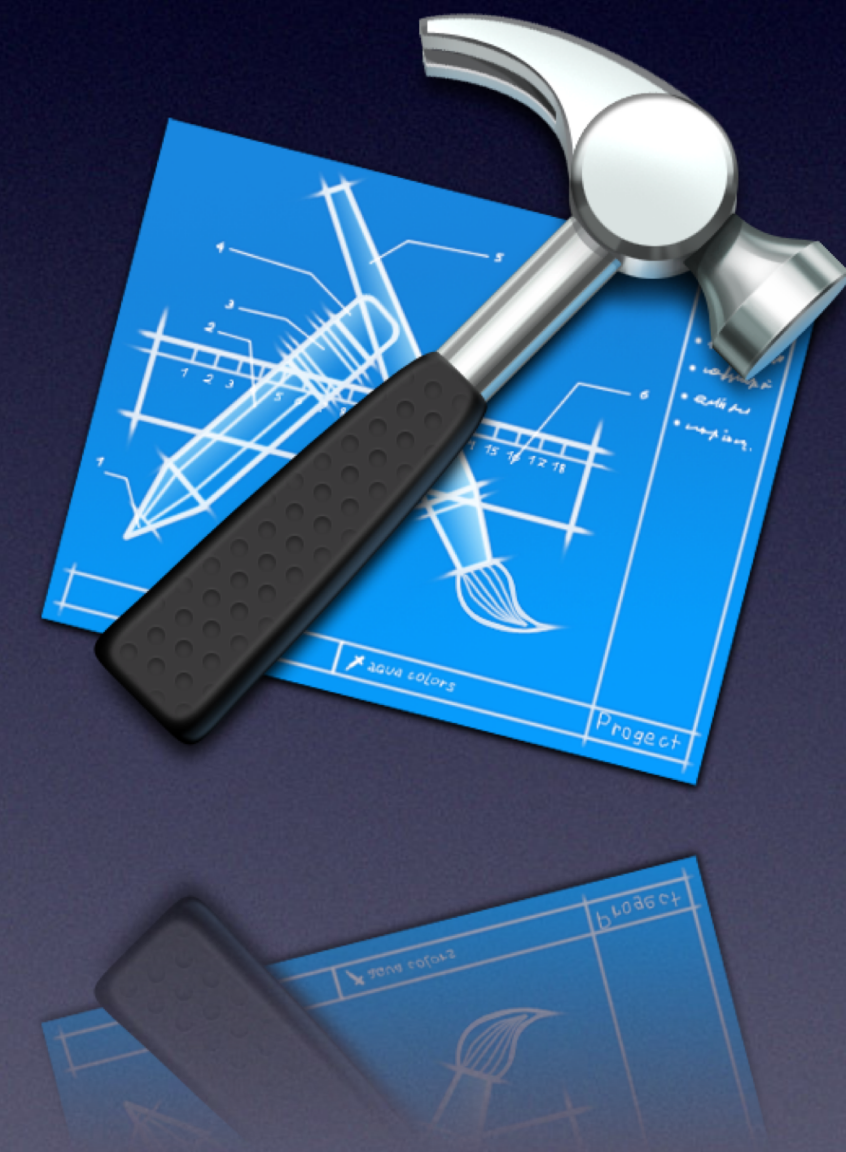
- Xcode Tools
  - Xcode
  - Instruments
- iOS simulator
- iOS Developer Library





## Xcode Tools

- Xcode is a tools used for developing softwares for Mac OS X and iOS
- An Integrated Development Environment (**IDE**) that manages to edit, compile, run and Debug source code
- Xcode supports C, C++, Objective C, Objective C++, Java, AppleScript, Python and Ruby source code with a variety of programming models
- Instruments are the runtime performance analysis and debugging Tools
- **iOS** Simulator **is** a **Mac OS X** application that simulates the **iOS** technology stack, allowing you to test **iOS** applications on Macintosh computer





## Xcode Version series

✓ 1.xseries

✓ 2.xseries

✓ 3.x series

✓ 4.x series

✓ 5.x series

✓ 6.x series

✓ 7.x series

✓ 8.x series

The latest stable release is Xcode version 14.3.1, which is available on the Mac App Store



## Introduction To Swift

- Swift is a new programming language developed by Apple Inc for iOS and OS X development. Swift adopts the best of C and Objective-C, without the constraints of C compatibility.
- The latest stable version for swift is 5.8





## Advantage Of Using Swift

- ✓ Swift is easier to read and write. It has less overhead and syntax requirements, and you can often achieve the same line of code using less characters.
- ✓ Swift can result in shorter overall code length. Swift is a functional programming language, which means you can do neat tricks like passing functions as variables. This means you can write highly generic code that can do a lot of different things, reducing repetition.
- ✓ Swift has some clever tricks up its sleeve, again due to having elements of a functional programming language. Things like 'map' and 'filter' for example.
- ✓ Swift is 'safer' - there's less memory management to worry about (basically none, compared to C).



## QUICKLY PROTOTYPE & BUILD CUSTOM APPS FOR iOS WITH SWIFT





## FEATURES THAT POPULAR SWIFT APPLICATION DEVELOPMENT

- ✓ Bundled with functional programming features.
- ✓ Closures unified with function pointers.
- ✓ Code writing is more interactive and fun with Swift.
- ✓ Syntax is brief yet expressive.
- ✓ Applications run very fast.
- ✓ Combines feature of both C and Objective-C.
- ✓ Adds feature to existing iOS apps.
- ✓ Very fast and efficient language.



Thank you!