Mobile Application Development

Produced by

Eamonn de Leastar (edeleastar@wit.ie)

Department of Computing, Maths & Physics
Waterford Institute of Technology

http://www.wit.ie

http://elearning.wit.ie

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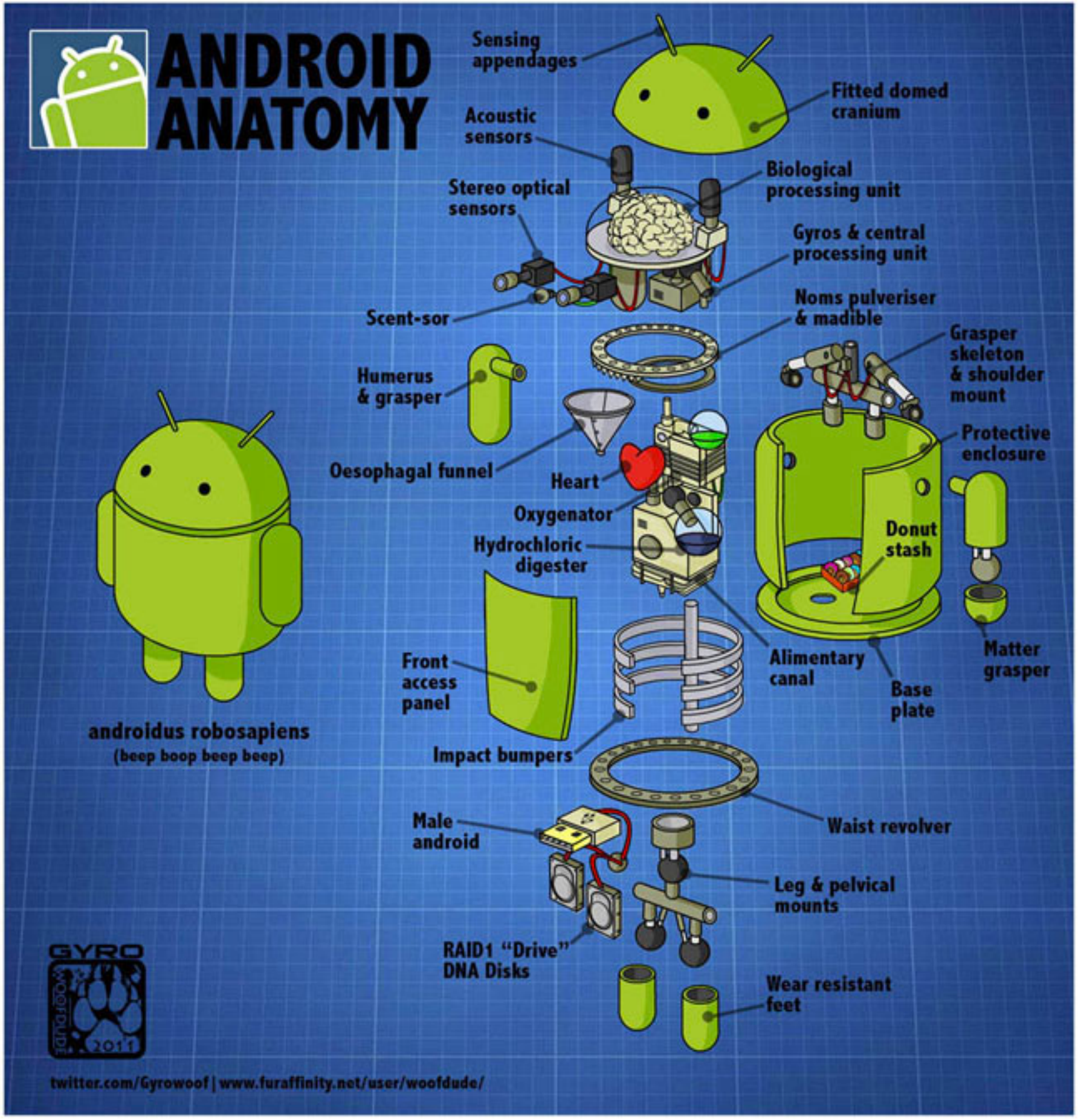
Introducing Android


ANDROID ANATOMY
Sensing appendages
Fitted domed cranium
Acoustic sensors
Biological processing unit
Stereo optical sensors
Gyros & central processing unit
Scent-sor
Noms pulveriser & madible
Humerus & grasper
Grasper skeleton & shoulder mount
Protective enclosure
Oesophagal funnel
Heart
Oxygenator
Hydrochloric digester
Donut stash
Front access panel
Alimentary canal
Base plate
Matter grasper
Impact bumpers
Waist revolver
Male android
Leg & pelvical mounts
RAID1 "Drive" DNA Disks
Wear resistant feet
androidus robosapiens
(beep boop beep beep)
GYRO
2011
twitter.com/Gyrowoof | www.furaffinity.net/user/woofdude/

Background (1)

- Android is a comprehensive open source platform designed for mobile devices.

- It is championed by Google and owned by Open Handset Alliance.

- The goal of the alliance is to “accelerate innovation in mobile and offer consumers a richer, less expensive, and better mobile experience.”

Background (2)

- Android, along with IOS, is revolutionising the mobile space.

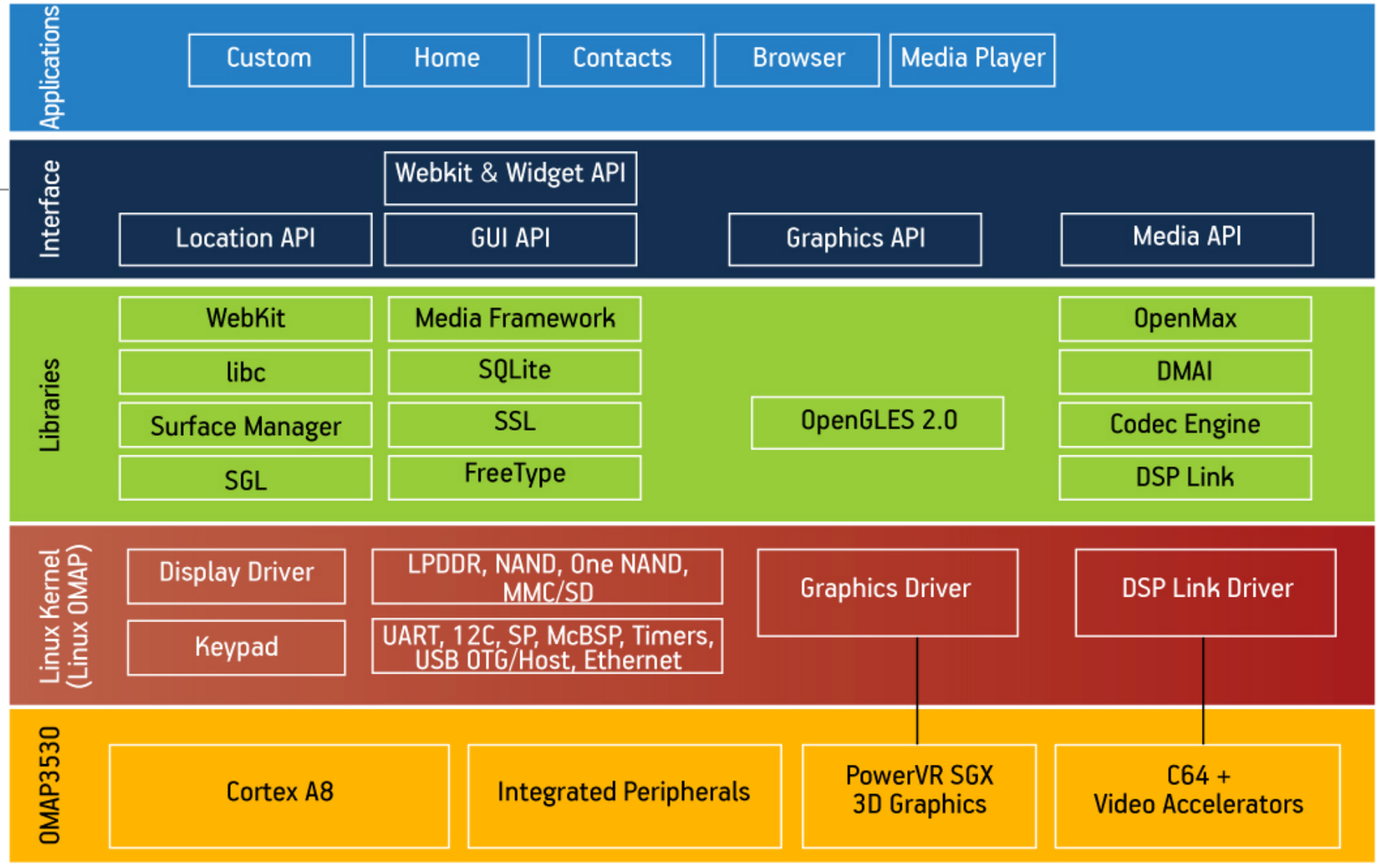
- Unlike IOS, Android is an open platform that separates the hardware from the software that runs on it.

- This allows for a much larger number of devices to run the same applications and creates a much richer ecosystem for developers and consumers.

Comprehensive

- Android is a comprehensive platform, which means it is a complete software stack for a mobile device.

- The Android SDK is all you need to start developing forAndroid; you don't even need a physical device.



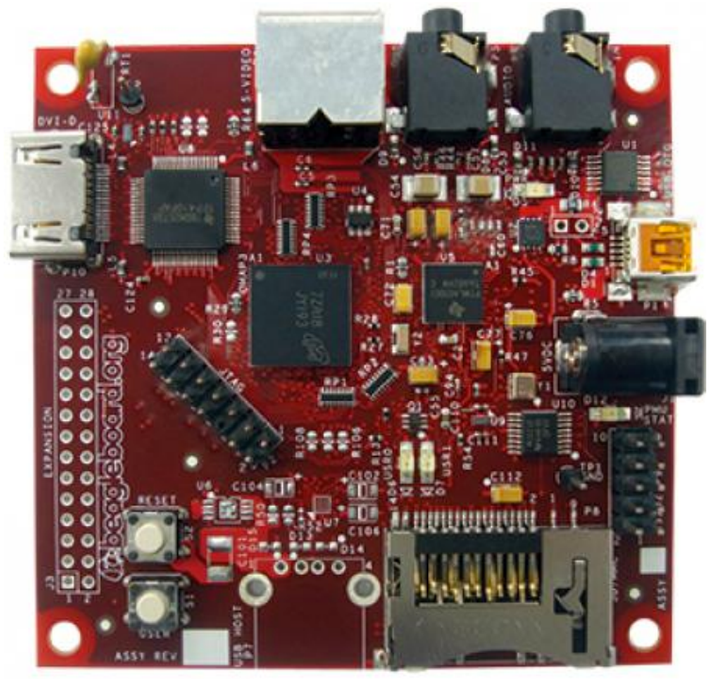
- Users can customize their phone experience substantially.

- Manufacturers can also customise the platform can substantial ways - even generating complete 'forks' of the original project (Amazon).

Open Source

- Android is an open source platform.
- Aside from the Linux kernel itself, Android is licensed under business-friendly licenses (Apache/MIT/BSD) so that others can freely extend it and use it for variety of purposes.
- Manufacturers can port Android OS to specific hardware. with minimal legal issues.
- Android has many hooks at various levels of the platform, allowing anyone to extend it in unforeseen ways.

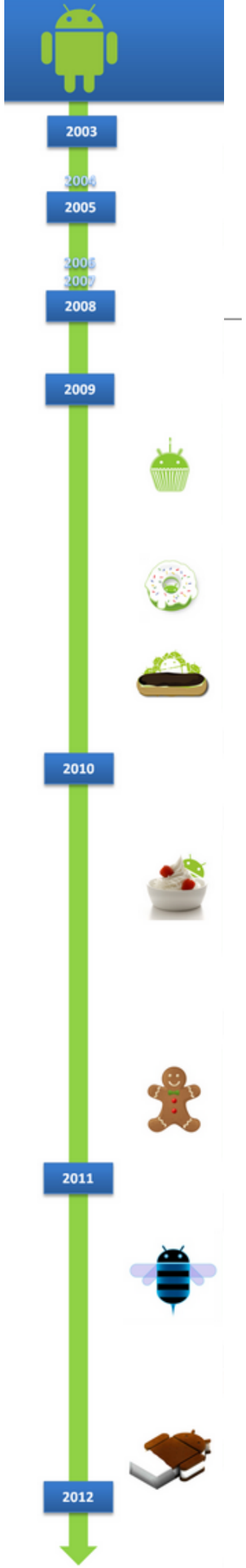
BeagleBoard, a low-cost development kit



Designed for Mobile Devices

- When designing Android, the team looked at which mobile device constraints likely were not going to change for the foreseeable future:
  - Battery powered, and battery performance likely is not going to get much better anytime soon.
  - In general, small size of mobile devices means that they will always be limited in terms of memory and speed.
  - However, a device's screen size, resolution, chipset may vary considerably
- These constraints have been taken into consideration throughout the platform.

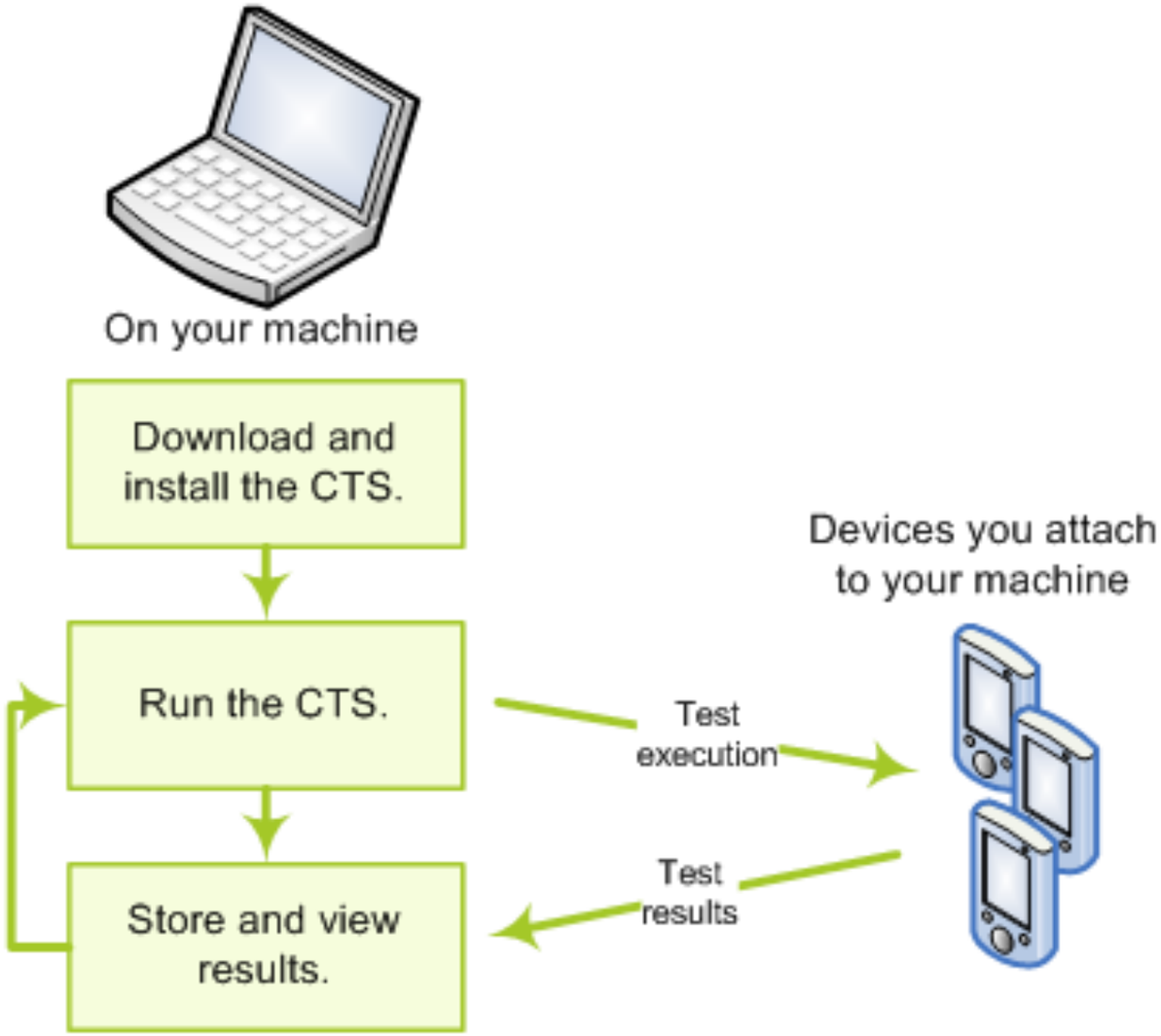
History



- In 2005, Google buys Android, Inc.
- In 2007, the Open Handset Alliance is announced. Android is officially open sourced.
- In 2008, the Android SDK 1.0 is released. The G1 phone, manufactured by HTC and sold by the wireless carrier T-Mobile USA, follows shortly afterward.
- 2009 sees a proliferation of Android-based devices. New versions of the operating system are released: Cupcake (1.5), Donut (1.6), and Eclair (2.0 and 2.1). More than 20 devices run Android.
- In 2010, Android is second only to BlackBerry as the best-selling smart phone platform. Froyo (Android 2.2) is released and so are more than 60 devices that run it.
- In 2011, Android is the #1 mobile platform by number of new activations and number of devices sold. The battle for dominating the tablet market is on.
- In 2012, GoogleTV, powered by Android and running on Intel x86 chips, is released. Android is now running on everything from the smallest of screens to the largest of TVs.
- In 2013, Google Glass, a wearable computing platform with an optical head- mounted display powered by Android is released to a select few.
- Beyond phones, tablets, and TVs, Android continues to be the big challenger to Embedded Linux as the platform for developing a number of specialized devices, such as home automation systems, car dashboards and navigation systems, as well as NASA satellites.

CTS

- The Compatibility Test Suite (CTS), defines what it means to be an Android-compatible device.
- CTS is a combination of automated tests as well as a document that specifies what an Android device must have, should have, or what features are simply optional.
- The goal of CTS is to ensure that, for a regular consumer, an average app from the market will run on an average Android device if that device claims to be supporting a certain version of Android.



Compatibility

- CTS is been completely avoided by Amazon with the Kindle Fire and phone series of devices, built on top of the Android OS.
- Note that manufacturers by no means have to adhere to CTS.
- Anyone is welcome to download and “remix” Android in any way they see fit.
- Android has been customized for everything from cars to satellites, and from photocopiers to washing machines.

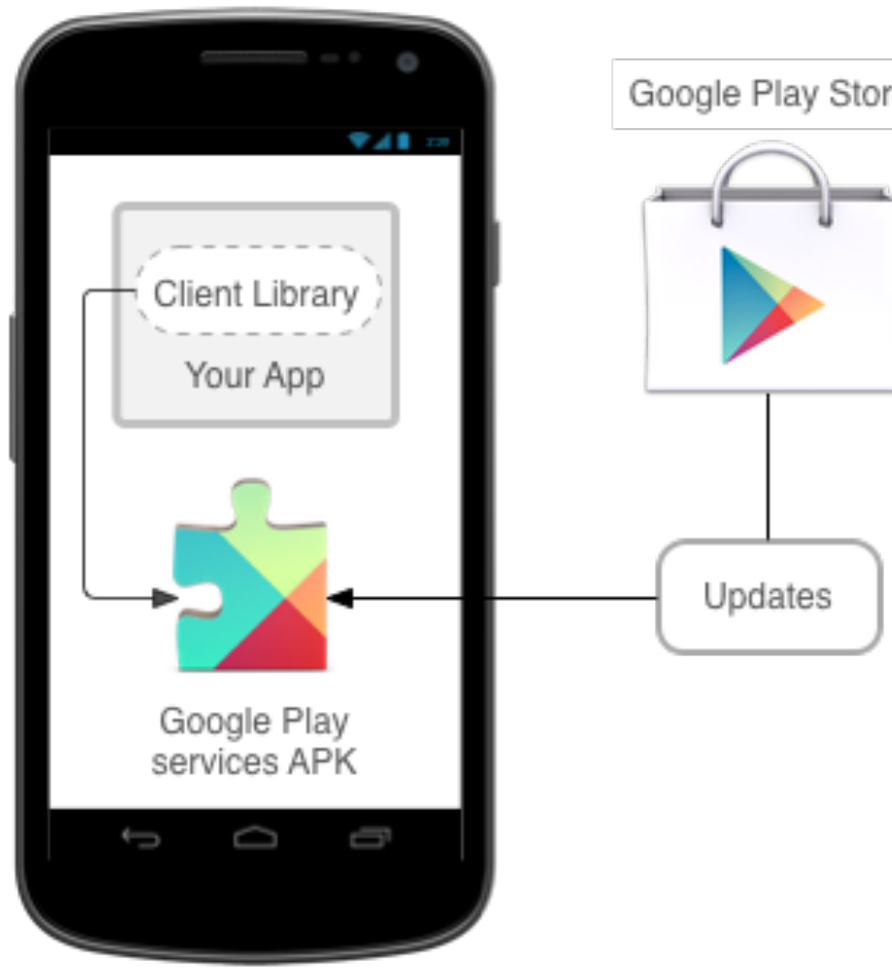
Area	Description
Signature tests	For each Android release, there are XML files describing the signatures of all public APIs contained in the release. The CTS contains a utility to check those API signatures against the APIs available on the device. The results from signature checking are recorded in the test result XML file.
Platform API Tests	Test the platform (core libraries and Android Application Framework) APIs as documented in the SDK Class Index to ensure API correctness, including correct class, attribute and method signatures, correct method behavior, and negative tests to ensure expected behavior for incorrect parameter handling.
Dalvik VM Tests	The tests focus on testing the Dalvik VM.
Platform Data Model	The CTS tests the core platform data model as exposed to application developers through content providers, as documented in the SDK android.provider package: contacts, browser, settings, etc.
Platform Intents	The CTS tests the core platform intents, as documented in the SDK Available Intents.
Platform Permissions	The CTS tests the core platform permissions, as documented in the SDK Available Permissions.
Platform Resources	The CTS tests for correct handling of the core platform resource types, as documented in the SDK Available Resource Types. This includes tests for: simple values, drawables, nine-patch, animations, layouts, styles and themes, and loading alternate resources.

Google Play Services

- The major reason manufacturers would want to ensure Android compatibility is access to Google Play, and its rich set of apps.

- Play services allow apps to take advantage of the latest, Google-powered features such as Maps, Google+, and more, with automatic platform updates distributed as an APK through the Google Play store.

- Makes it faster for phone to receive updates and easier for developers to integrate the some new features into their apps.



ROID

C

1.5
CupCake

D

1.6
Donut

E

2.02.1
Eclair

F

2.2
Froyo

G

2.3
Gingerbread

H

3.0
Honeycomb

I

4.0
Ice Cream
Sandwich

J

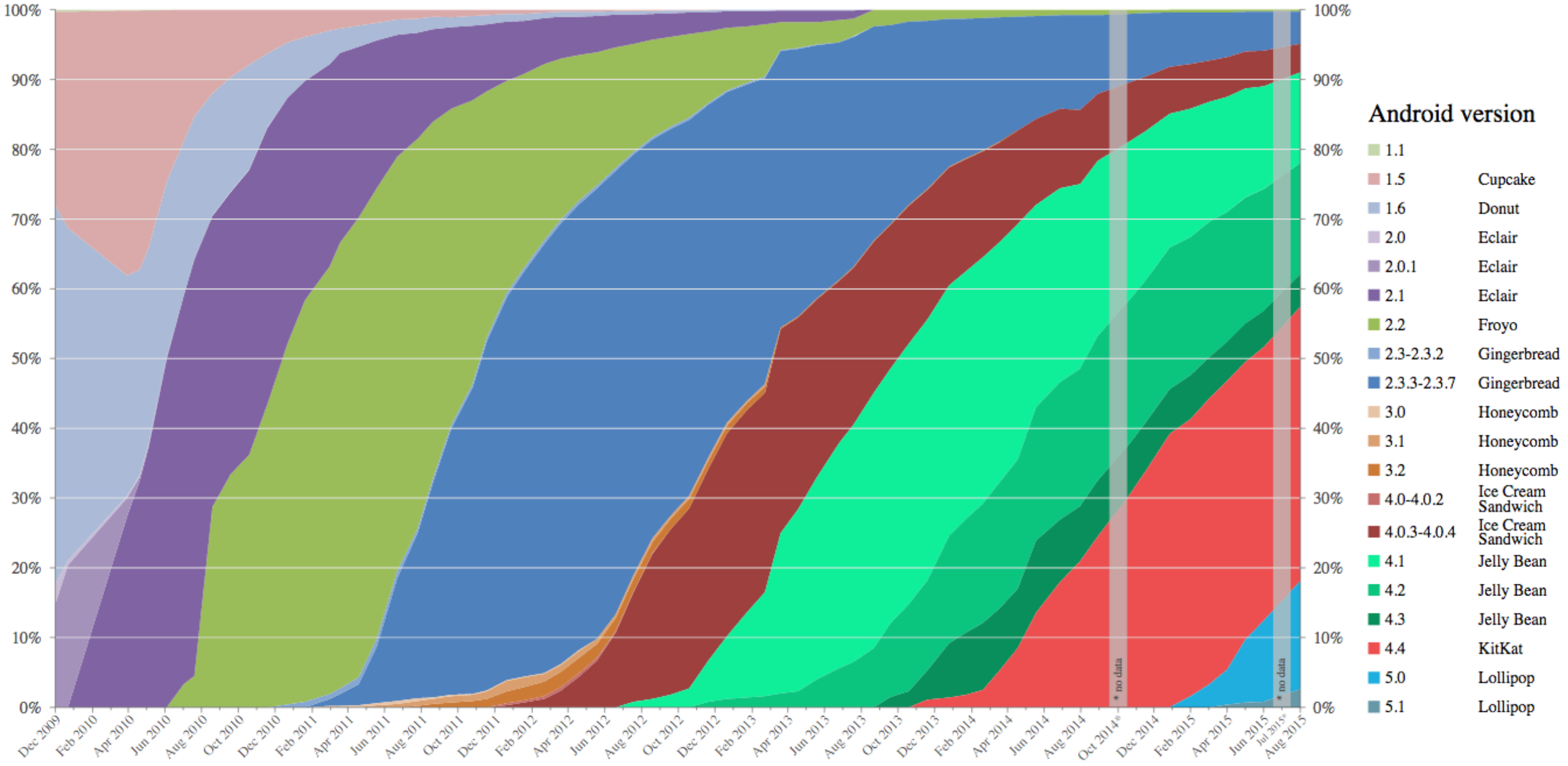
4.1
Jellybean

K

4.4
KitKat

L

5.0
Lollipop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Jun 2013
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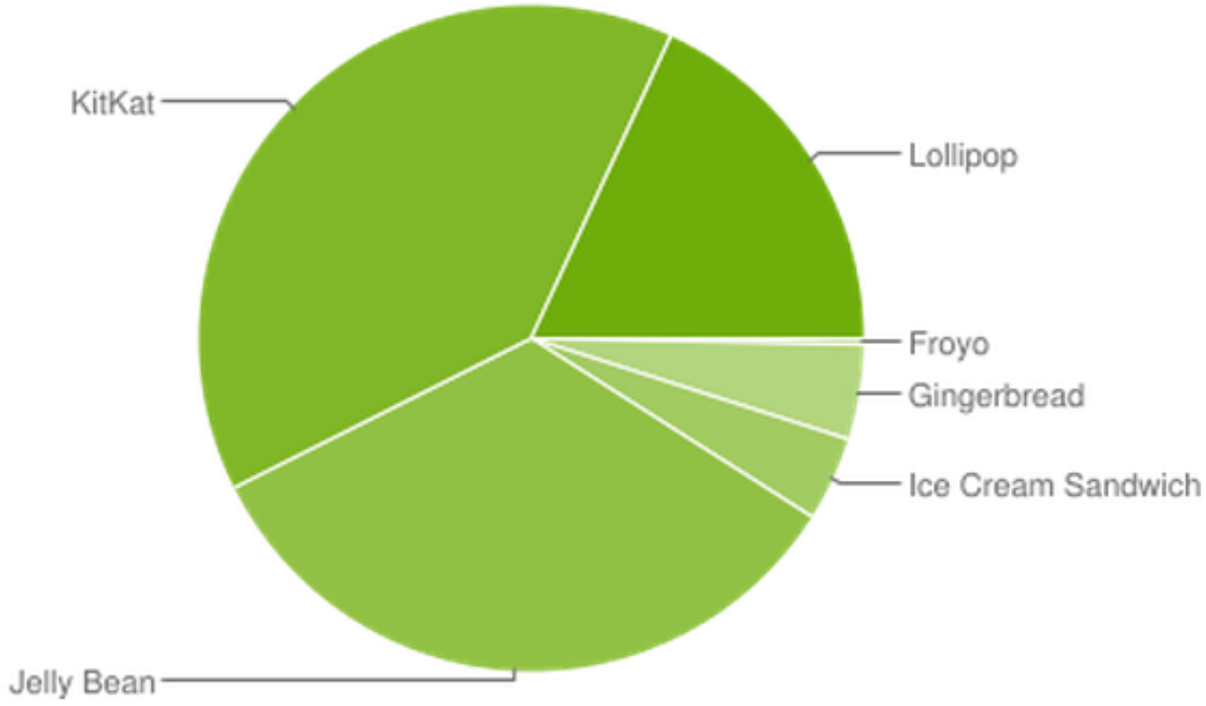
Feb 2014
Apr 2014
Jun 2014
Aug 2014
Oct 2014*
Dec 2014
Feb 2015
Apr 2015
Jun 2015
Jul 2015*
Aug 2015
* no data
* no data
Android version
1.1
1.5 Cupcake
1.6 Donut
2.0 Eclair
2.0.1 Eclair
2.1 Eclair
2.2 Froyo
2.3-2.3.2 Gingerbread
2.3.3-2.3.7 Gingerbread
3.0 Honeycomb
3.1 Honeycomb
3.2 Honeycomb
4.0-4.0.2 Ice Cream Sandwich
4.0.3-4.0.4 Ice Cream Sandwich
4.1 Jelly Bean
4.2 Jelly Bean
4.3 Jelly Bean
4.4 KitKat
5.0 Lollipop
5.1 Lollipop

Versions

Version	Codename	API	Distribution
2.2	Froyo	8	0.3%
2.3.3 - 2.3.7	Gingerbread	10	4.6%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	4.1%
4.1.x	Jelly Bean	16	13.0%
4.2.x		17	15.9%
4.3		18	4.7%
4.4	KitKat	19	39.3%
5.0	Lollipop	21	15.5%
5.1		22	2.6%



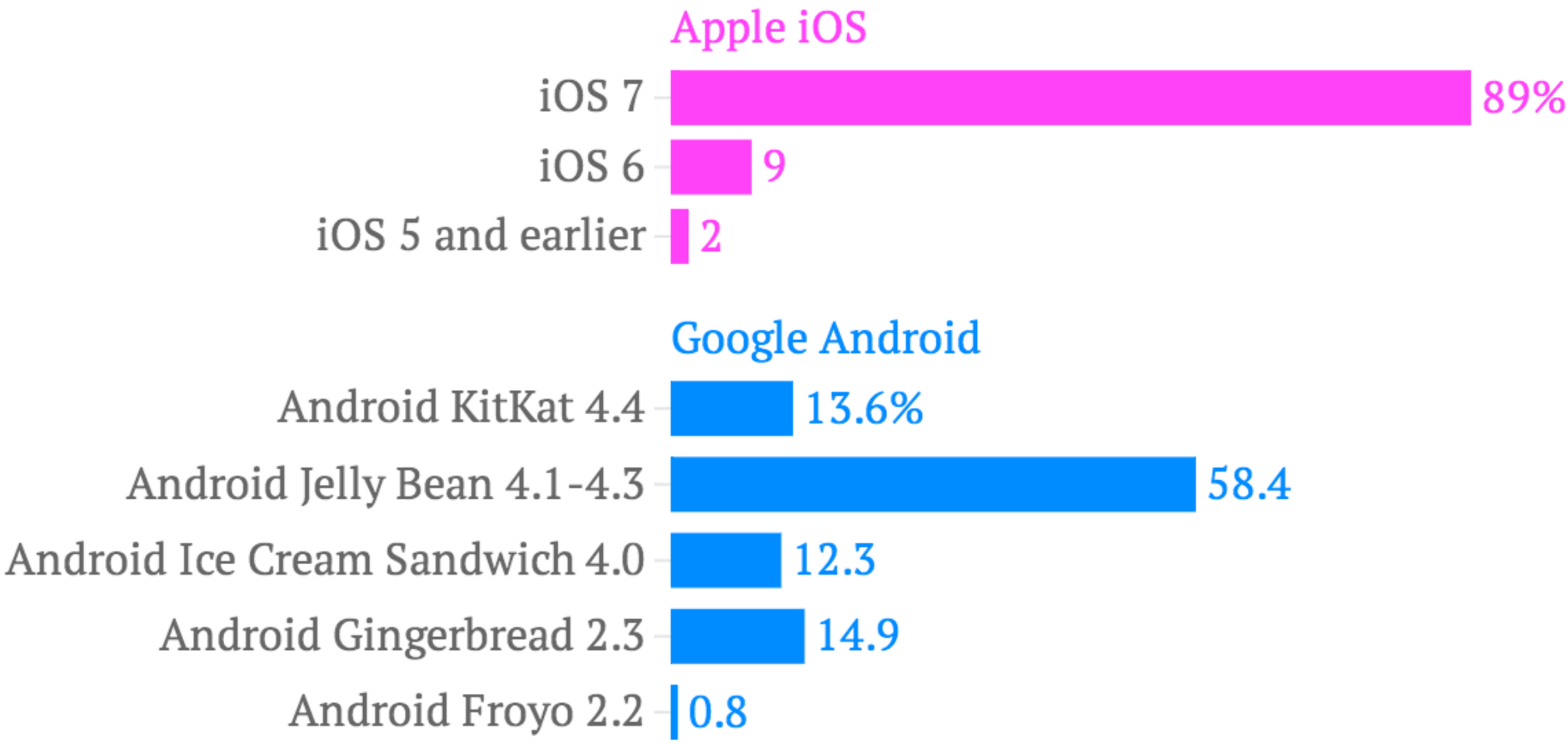
- The Android version number itself partly tells the story of the software platform's major and minor releases. What is most important is the API level. Version numbers change all the time, sometimes because the APIs have changed, and other times because of minor bug fixes or performance improvements.

- As an application developer, you will want to make sure you know which API level your application is targeting in order to run. That API level will determine which devices can and cannot run your application.

Target Version

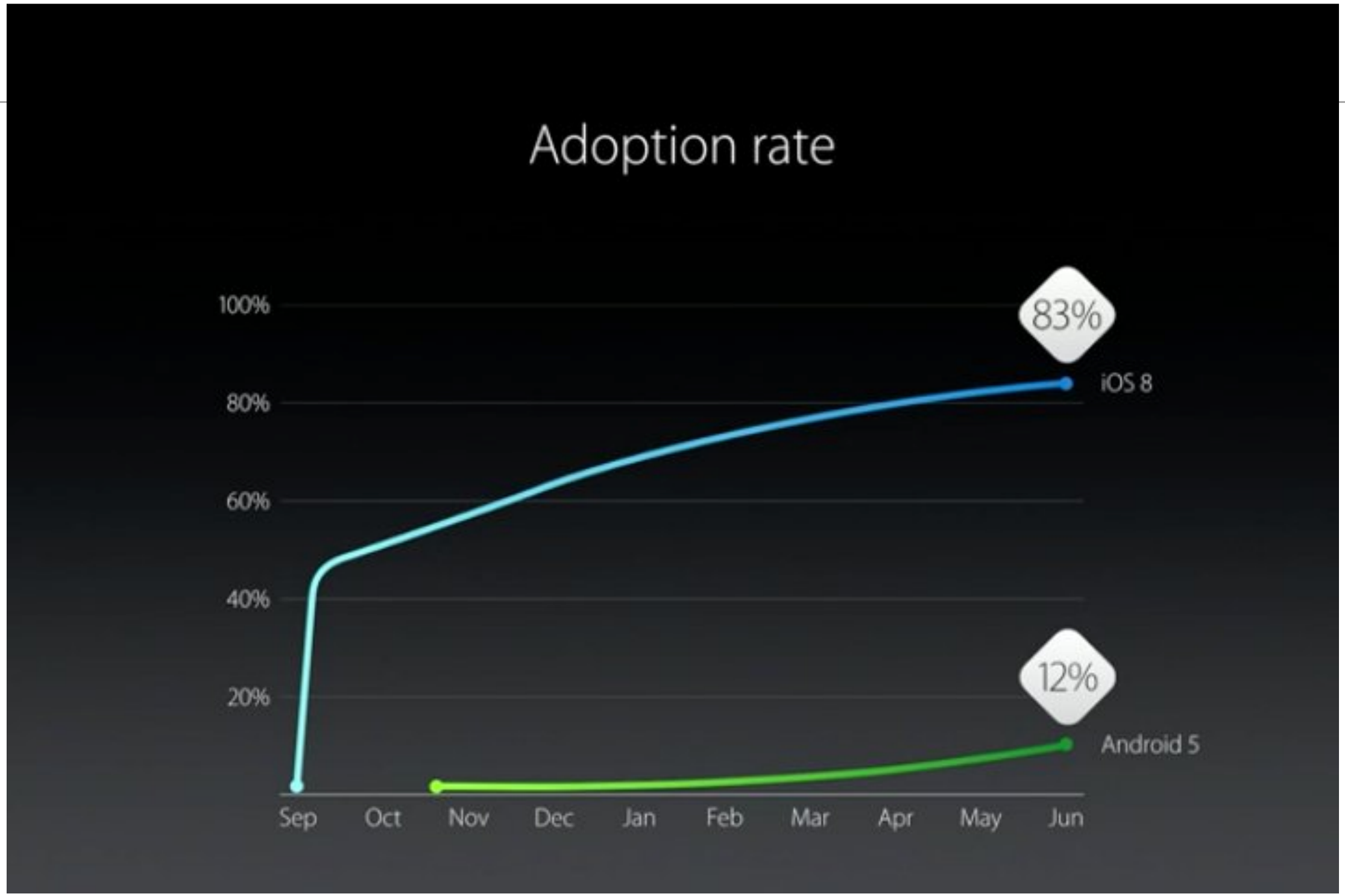
- A developers objective may be to have an application run on as many devices as possible.
    - shoot for the lowest API level possible. Keep in mind the distribution of Android versions on real devices out there.
- You may notice that there are a lot of users of Android 2.3.3+ and 4.1.x. This places the latest and greatest (4.1.x) version as the second largest version currently in the wild.
- This hasn’t always been the case because OEMs tended to be very slow in upgrading their OS versions. However, this has changed with Google’s strong push to get everyone onto the latest versions.
- Unfortunately, there are still a lot of people who have the 2.3.3 version because they have yet to upgrade their phones to a phone with the hardware capable of handling the newer version.

Apple iOS and Google Android adoption rates (newest version on top)



Quartz | qz.com

Data: Apple (via Bloomberg Businessweek), Google


Adoption rate
100%
80%
60%
40%
20%
83%
iOS 8
12%
Android 5
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun