

Lesson-1

Introduction to Android



Agenda

- What is Android?
- Android Architecture
- Android Features
- Android Releases
- Android Components

What is Android?

- The Android Developer's Guide formally defines Android as a software stack.
 - A set of software subsystems needed to deliver a fully functional solution for mobile devices.
 - This stack includes an operating system (a modified version of the Linux kernel),
 - middleware (software that connects the low-level operating system to high-level apps) that's partly based on Java,
 - and key apps (written in Java) such as a web browser (known as Browser) and a contact manager (known as Contacts).



Android Architecture



APPLICATIONS

Home

Contacts

Phone

Browser

...

APPLICATION FRAMEWORK

Activity Manager

Window
Manager

Content
Providers

View
System

Package Manager

Telephony
Manager

Resource
Manager

Location
Manager

Notification
Manager

LIBRARIES

Surface Manager

Media
Framework

SQLite

OpenGL | ES

FreeType

WebKit

SGL

SSL

libc

ANDROID RUNTIME

Core Libraries

Dalvik Virtual
Machine

LINUX KERNEL

Display
Driver

Camera Driver

Flash Memory
Driver

Binder (IPC)
Driver

Keypad Driver

WiFi Driver

Audio
Drivers

Power
Management

Android Features

- Complete, open, and free mobile platform with secure OS and robust framework.
- Application framework enabling reuse and replacement of app components
 - Bluetooth, EDGE, 3G, and WiFi support (hardware dependent)
 - Camera, GPS, compass, and accelerometer support (hardware dependent)
- Dalvik Virtual Machine is optimized for mobile devices.
- Telephony support
- Integrated browser based on the open source WebKit engine for rendering web pages
- Media support for common audio, video, and still-image formats (MPEG-4, H.264, MP3, AAC, AMR, JPG, PNG, GIF)
- Optimized graphics powered by a custom 2D graphics library; 3D graphics based on the OpenGL ES 1.0, 1.1, or 2.0 specification
- GPS support
- XML support for Designing
- SQLite for structured data storage by default.

Android Releases

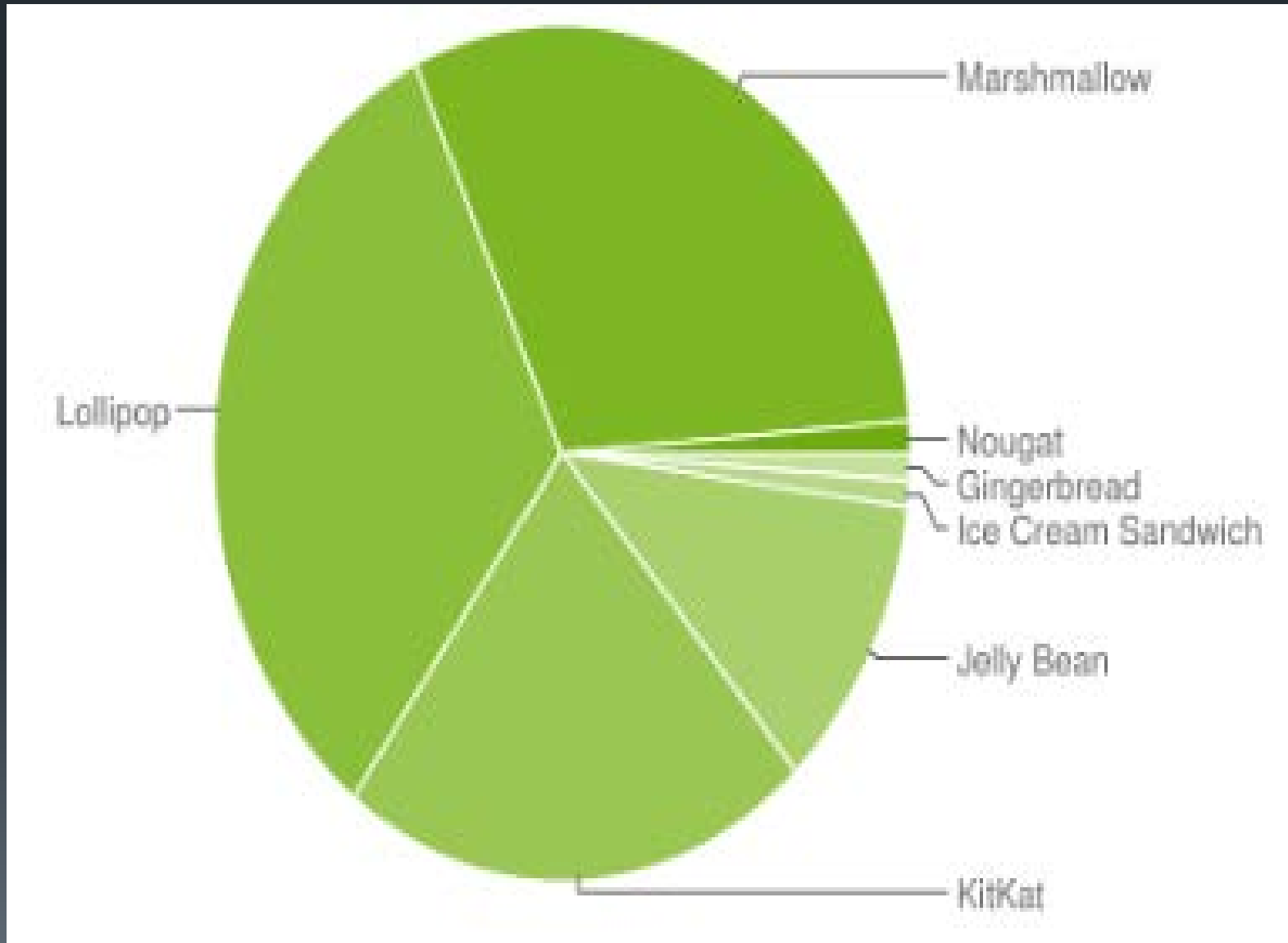


- Android did not originate with Google. Instead, Android was initially developed by Android, Inc., a small Palo Alto, California–based startup company.
- Google bought this company in the summer of 2005 and released a beta version of the Android Software Development Kit (SDK) in November 2007.
- On September 23, 2008, Google released Android 1.0, whose core features included a web browser, camera support, Google Search, and more.
- Table from the next slide outlines subsequent releases. (Starting with version 1.5, each major release comes under a code name that's based on a dessert item.)
- More Info : <https://source.android.com/setup/build-numbers>

Android Version, Codename, API Level

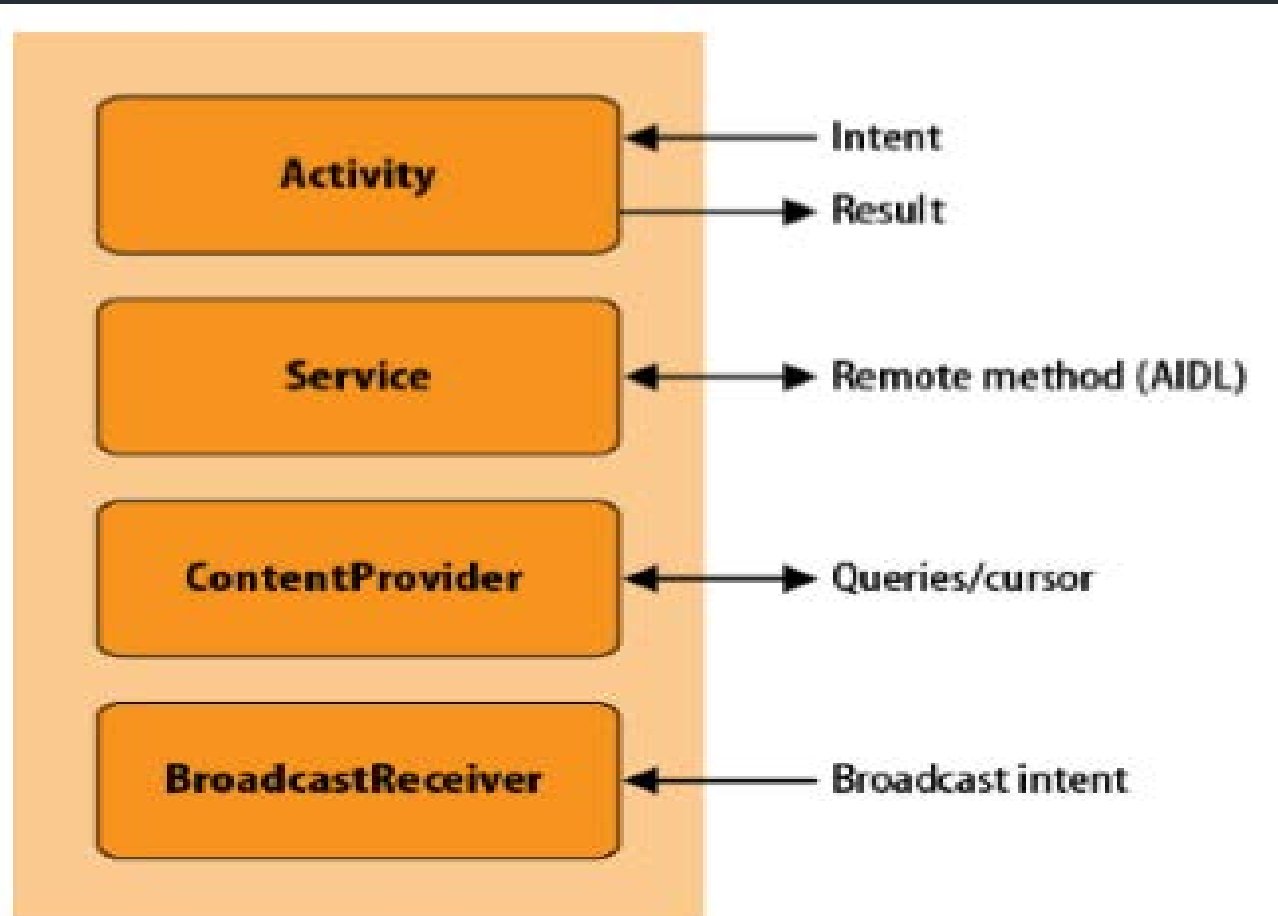
Code name	Version	API level
Oreo	8.1.0	API level 27
Oreo	8.0.0	API level 26
Nougat	7.1	API level 25
Nougat	7.0	API level 24
Marshmallow	6.0	API level 23
Lollipop	5.1	API level 22
Lollipop	5.0	API level 21
KitKat	4.4 - 4.4.4	API level 19
Jelly Bean	4.3.x	API level 18
Jelly Bean	4.2.x	API level 17
Jelly Bean	4.1.x	API level 16
Ice Cream Sandwich	4.0.3 - 4.0.4	API level 15, NDK 8
Ice Cream Sandwich	4.0.1 - 4.0.2	API level 14, NDK 7
Honeycomb	3.2.x	API level 13
Honeycomb	3.1	API level 12, NDK 6
Honeycomb	3.0	API level 11
Gingerbread	2.3.3 - 2.3.7	API level 10
Gingerbread	2.3 - 2.3.2	API level 9, NDK 5
Froyo	2.2.x	API level 8, NDK 4
Eclair	2.1	API level 7, NDK 3
Eclair	2.0.1	API level 6
Eclair	2.0	API level 5
Donut	1.6	API level 4, NDK 2
Cupcake	1.5	API level 3, NDK 1
(no code name)	1.1	API level 2
(no code name)	1.0	API level 1

Android Version, Codename, API Level



Android Components

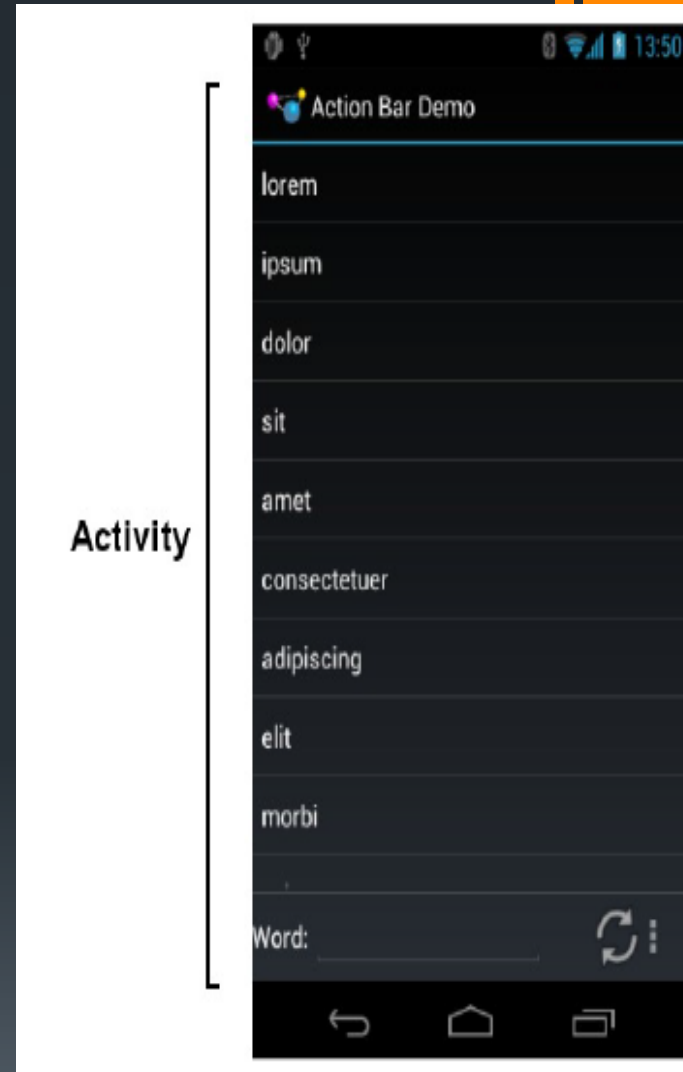
- Application components are the essential building blocks of an Android application. To make use of any of them, an application must include corresponding declarations in its AndroidManifest.xml file (will discuss in next lesson).



Android Components

1. Activity :

- Every single screen is one activity. It's a java file.
- The building block of the user interface is the *activity*.
- It represents a chunk of your user interface and, in some cases, a discrete entry point into your app (i.e., a way for other apps to link to your app).
- When you make an interactive Android program, you start by sub classing the Activity class.
- Activities provide the reusable, interchangeable parts of the flow of UI components across Android applications.





2. Service :

- The Android Service class is for background tasks that may be active but not visible on the screen. It works without user interaction.
- Example : A music-playing application would likely be implemented as a service in order to continue to play music while a user might be viewing web pages.
- WiFi availability status

3. Content Providers :

- Applications can not directly share data between them in Android. It is one of the important security feature. But Content Providers implement a mechanism for the sharing of data between applications.
- A content provider component supplies data from one application to others on request.
- Example Whatsapp can read data from Contacts with the help of Content Providers.

4. Broadcast Receiver

- The BroadcastReceiver class implements another variant of Android's high-level inter process communication mechanism using Intent objects.
- It is registered for system announcements.
- A typical use for a broadcast receiver might be to receive an alarm that causes an app to become active at a particular time.
- Broadcast Receivers operate in the background and do not have a user interface.
- Example : Once you insert a head phone, automatically your phone recognize that by showing a headphone symbol, device starts charging, data downloaded.