
android

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Agenda

- Introduction To Android
 - History
 - Android Architecture
 - Build Process
 - App Project Structure
 - Languages
 - Anatomy of Application
 - Tools
 - Hands On Session
 - Notification -
PostMortem
 - A Workshop
-

Overview

Introduction

- Open source software. Mobile version of modified Linux kernel
- Over 24,000 phones and tablets that run on Android globally.
- Android runs on devices of all shapes and sizes. Phone, Tablets, Watch, Car, TV



Google sponsored
Chrome OS

Introduction cont

- Featured Brands Samsung, Google, Oppo, Motorola, Mi, Nokia
- Over 3 billion active Android devices, 190 countries
- AR, VR, ML, AI - Google Assistant
- Provides sdk for developers

Color OS

One UI

Annual shipment

2020 - 1.05b

2021 - 0.98b



Andy Rubin

2007 First Device

History

- Rival of Symbian, MS Windows Mobile
- Blackberry, iPhone
- Google acquisition secretive Android Inc
- November 2007, with the first commercial Android device, the HTC Dream

History cont

| ANDROID PLATFORM VERSION | API LEVEL | CUMULATIVE DISTRIBUTION |
|--------------------------|-----------|-------------------------|
| 4.1 Jelly Bean | 16 | |
| 4.2 Jelly Bean | 17 | 99.9% |
| 4.3 Jelly Bean | 18 | 99.7% |
| 4.4 KitKat | 19 | 99.7% |
| 5.0 Lollipop | 21 | 98.8% |
| 5.1 Lollipop | 22 | 98.4% |
| 6.0 Marshmallow | 23 | 96.2% |
| 7.0 Nougat | 24 | 92.7% |
| 7.1 Nougat | 25 | 90.4% |
| 8.0 Oreo | 26 | 88.2% |
| 8.1 Oreo | 27 | 85.2% |
| 9.0 Pie | 28 | 77.3% |
| 10. Q | 29 | 62.8% |
| 11. R | 30 | 40.5% |
| 12. S | 31 | 13.5% |

Last updated: August 4th, 2022

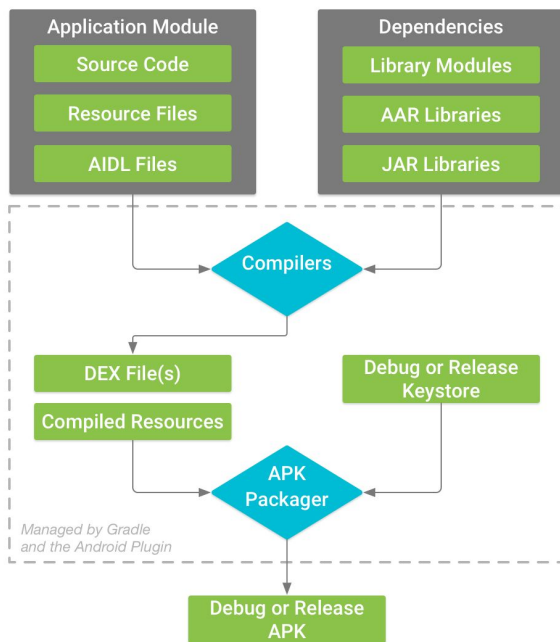
- 1.0,1.1, Edible Items(CupCake to Pie), 10, 11, 12, 13 (Tiramisue)
- Android 13, the latest version of Android
- Announcements - Google IO May-Jun in MountainView, California

Android Architecture



- Application Framework
- Binder IPC (InterProcess Communication)
- System Services
- HAL (Hardware)
- Linux Kernel (Chip & Board)

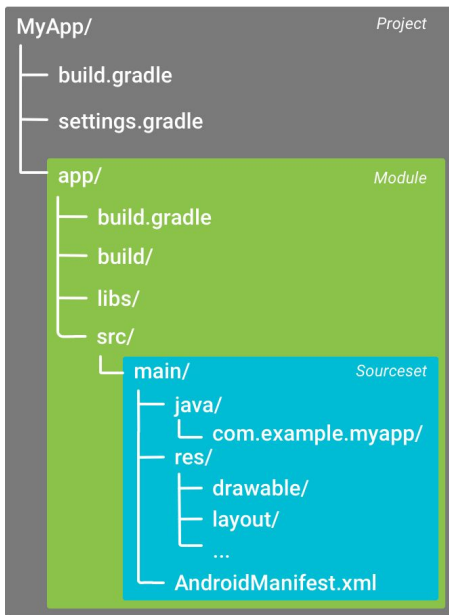
Build Process



- Gradle build system
- The compilers convert your source code into DEX (Dalvik Executable) files, byte codes.
- The packager combines the DEX files and compiled resources into an APK or AAB
- Android Application Package (APK) or Android App Bundle (AAB)

Build Your First App

App Project Structure



- `settings.gradle` which modules it should include while build
- Top level `build.gradle` defines dependencies that apply to all modules
- module-level `build.gradle` to configure build settings for the specific module (`minSdkVersion`, `targetSdkVersion`)
- `src/main` `src/buildTypes` includes code and resources common
- `src/main/res` layouts and drawables

Languages

- Java
- Kotlin
- C++
- Xml
- Sqlite Db



Tip

Learning OOP's will
make the
languages easy.

All in One..

Anatomy of Application


- **Activities** entry point for interacting with the user. It represents a single screen with a user interface.
- **Services** general-purpose entry point for keeping an app running in the background for all kinds of reasons. service does not provide a user interface



App Components

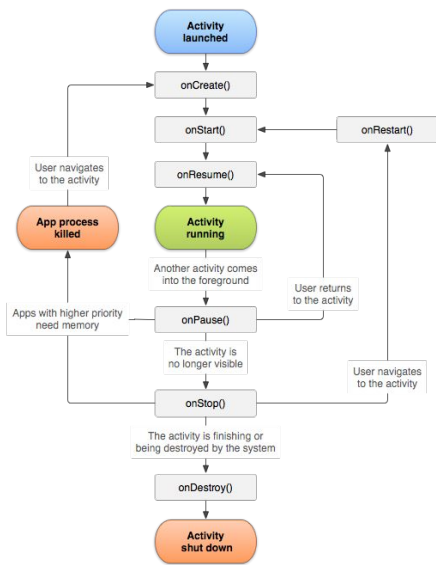
Anatomy of Application cont

- **Broadcast receivers** well-defined entry into the app, the system can deliver broadcasts even to apps that aren't currently running. Notifications
- **Content providers** can store in the file system, in a SQLite database and other persistent storage location cache



FCM Notification
Room

Activity



- Unlike programming paradigms in which apps are launched with a `main()` method, the Android system initiates code in an Activity instance
- An activity provides the window in which the app draws its UI
- Most apps contain multiple screens, which means they comprise multiple activities
- Intent Filters - SEND, SHARE
- State Changes using `onSaveInstanceState()` and `getArguments`
- **Intent** is a messaging object `startActivityForResult()` `startService()` `sendBroadcast()`

Manifest.xml

- The system must know that the component exists by reading the app's *manifest file*
- App must declare all its components in this file



<activity>

<service>

<receiver>

<provider>

```
<?xml version="1.0" encoding="utf-8"?>
<manifest ... >
    <application android:icon="@drawable/app_icon.png" ... >
        <activity android:name="com.example.project.ExampleActivity"
            android:label="@string/example_label" ... >
        </activity>
        ...
    </application>
</manifest>
```

Tools

- **Android Studio** provides the fastest tools for building apps on every type of Android device.
- **Emulator** simulate different configurations and device types, including Tablets, Wear OS, Android Automotive, and Android TV.



IntelliJ

JetBrains

Tools cont

- **Intelligent code editor** that provides code completion for Kotlin, Java, and C/C++ programming languages
- Sdk Manager. AVD
- Windows, Mac, Linux



ChromeOS

Profiler

Apk Analyser

Hands On Session

- New Project
- Hello World
- Layouts (LinearLayout, RelativeLayout, ConstraintLayout)
Text Box ,Menu, Button, Radio button , Check Box
- User Registration / Login Application
- Generating .APK Files
- Installing .APK file in a Smartphone - Demo



Tip

ViewGroup
Padding, Margins

Design Patterns

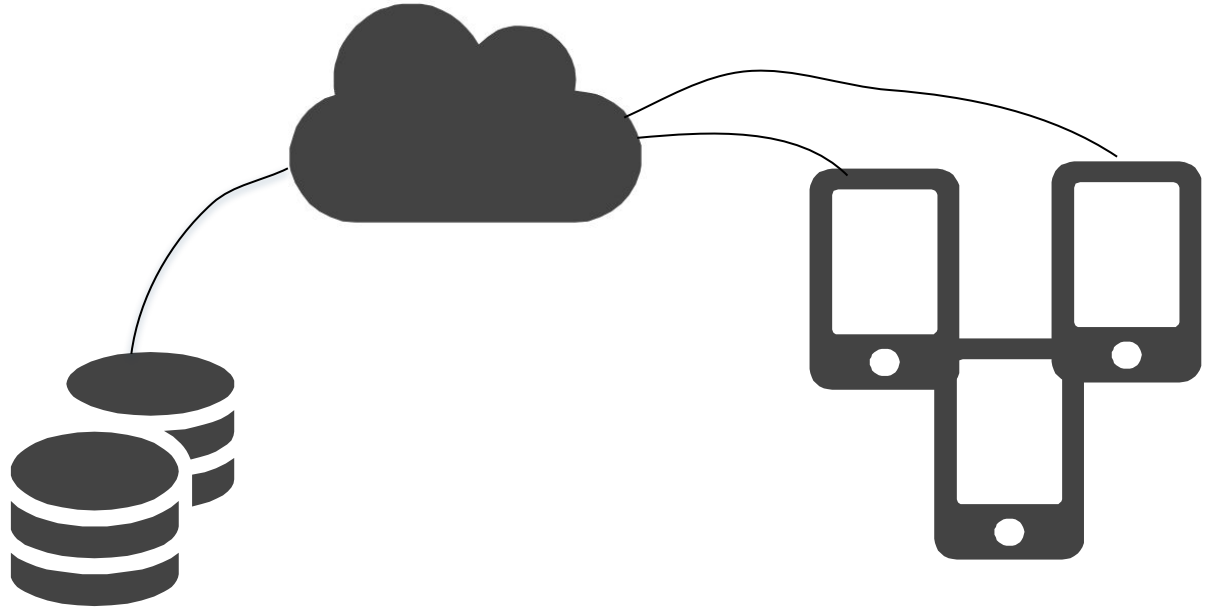
Wonder to Code !!!



Tip

Learn the basics to
understand the
problem and
solution
MVC, MVVM

Notification - PostMortem



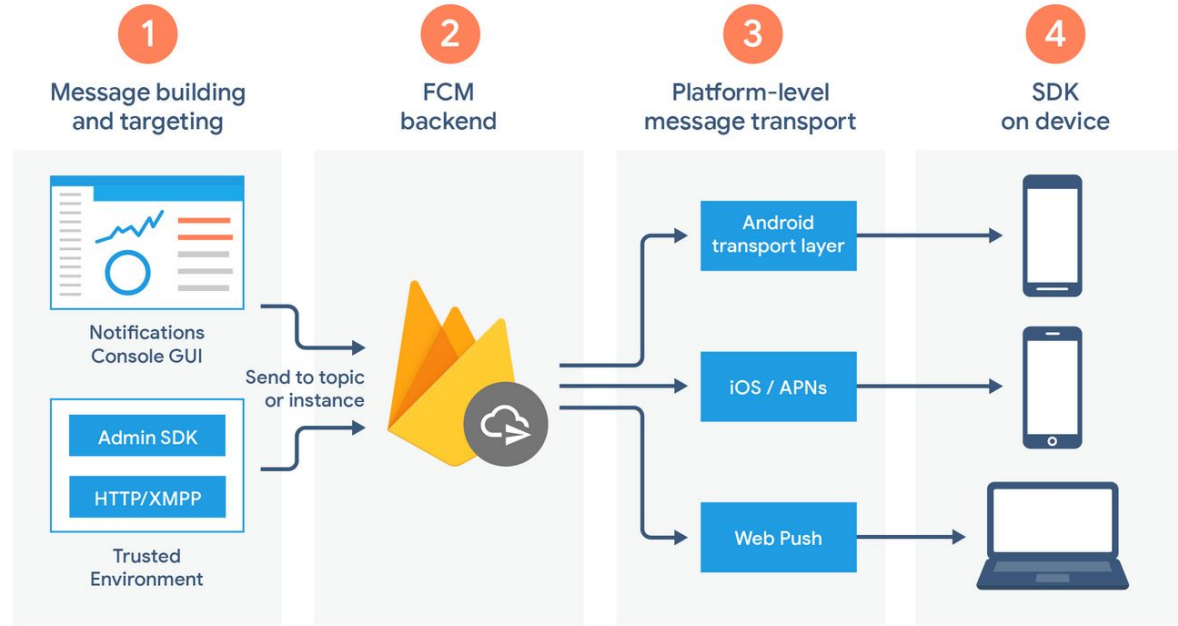
Tip

Android, iOS
MySQL
RegisterAPI
Cloud
Google, Apple
Messaging Server

Notification - PostMortem

Tip

Android, iOS
MySQL
RegisterAPI
Cloud
Google, Apple
Messaging Server



WorkShop

Open Weather API

<http://api.openweathermap.org/data/2.5/weather?q=coimbatore&units=metric&appid=ae61a217472f97a10239627b67c157f4>

Covid19 India API

https://api.covid19india.org/state_district_wise.json

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Thank You...

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