ANDROID

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AGENDA

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Open Handset Alliance

- Est. 2007, led by Google,open source
- Main product: Android Platform
- HTC to deliver Android capable device soon!

What is Android?

- A complete & modern embedded operating system
- A cutting-edge mobile user experience
- A world-class software stack for building applications
- An open platform for developers, users & industry

Why Android Was Created?

- Full phone software stack including applications
- Designed as a platform for software development
- Android is open
- Android is free
- Community support
- 100% Java Phone

Android Features

1. SOFTWARE FEATURES

- Integrated browser based on the open source **WebKit** engine
- **SQLite** for relational data storage
- Media support for common audio, video, and still image formats (**MPEG4**, H.264, **MP3**, AAC, AMR, **JPG**, PNG, **GIF**)
- **Dalvik Virtual Machine** optimized for mobile devices

2. HARDWARE FEATURES

- Cellular networking : GSM, EDGE, 3G (hardware dependent)
- LAN : Bluetooth, and Wi-Fi (hardware dependent)
- Graphics Hardware Acceleration
- Camera, GPS and Compass (hardware dependent)
- **Touch screen** and **accelerometer** for motion sensing

ANDROID ARCHITECTURE

Application Framework

Content Providers- that enable applications to access data from other applications (such as Contacts), or to share their own data

Resource Manager- providing access to non-code - resources such as localized strings, graphics, and layout files

Notification Manager -that enables all applications to display custom alerts in the status bar

Activity Manager -that manages the lifecycle of applications and provides a common navigation backstack

Package Manager - shows all the applications installed on your device

Telephony Manager - For all Calls/SMS/MMS managing

Libraries

- Written in C/C++ - System C Library(libc)
- Display/Graphics(SGL)
- Media Libraries
- SQLite –RDB engine-light weight
- LibWebCore–web browser engine–embeddable web view

Android Runtime

- Includes a set of core libraries that provides most of the functionality-JAVA
- Every Android application runs in its own process
- Dalvik VM executes files in the (.dex) format
- Device can run multiple VMs efficiently

Anatomy of an Android Application

There are four building blocks for an Android application:

- **Activity**
  - -a single screen

- **Intent Receiver**
  - -to execute in reaction to an external event(Phone Ring)
- **Service**
  - -code that is long-lived and runs without a UI(Media Player)

- **Content Provider**
  - -an application's data to be shared with other applications

Android Building Blocks

These are the most important parts of the Android APIs:

- AndroidManifest.xml
  -the control file-tells the system what to do with the top-level components

- Activities
  -an object that has a life cycle-is a chunk of code that does some work

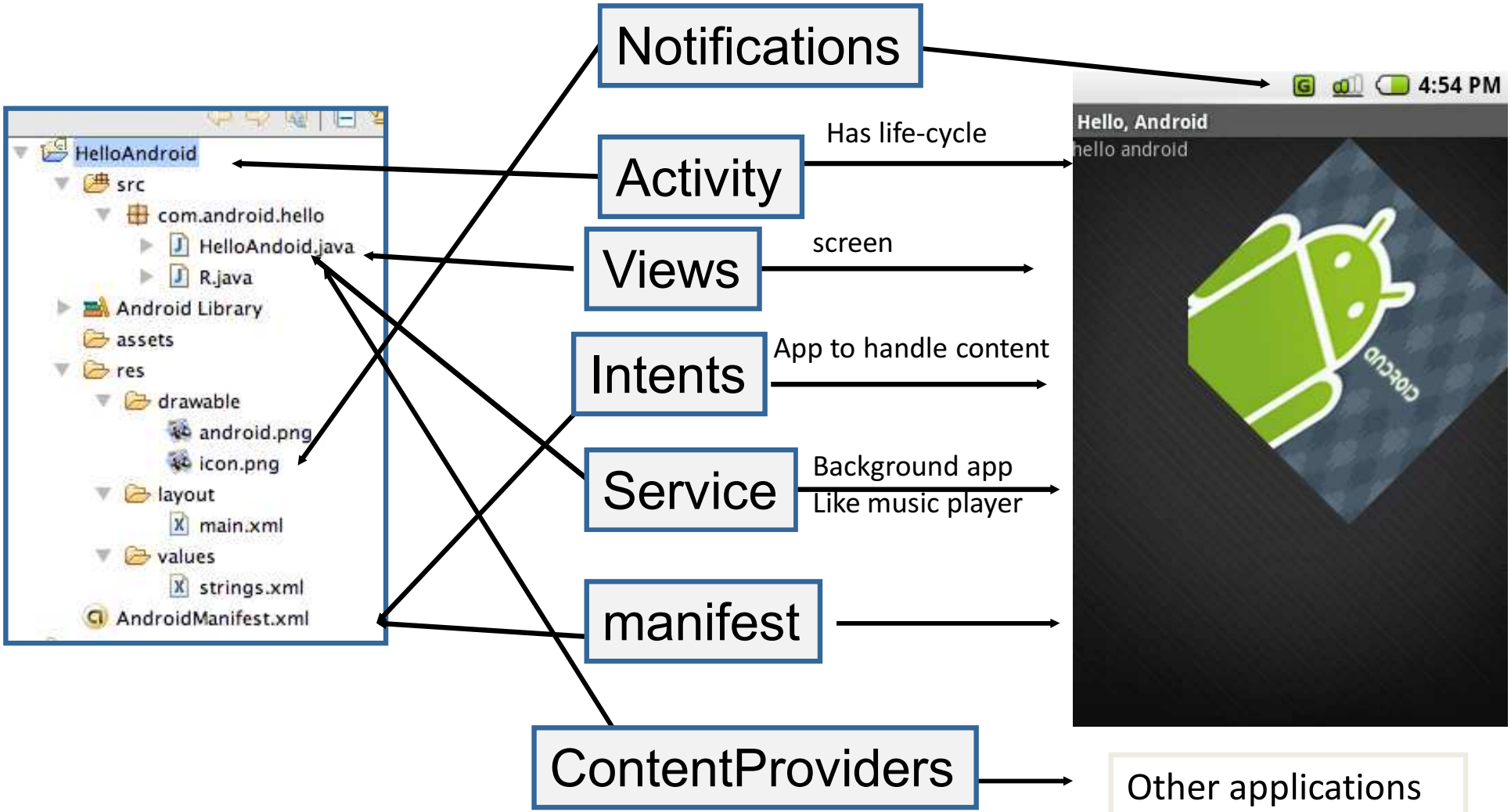
- Views
  -an object that knows how to draw itself to the screen

- Intents
  -a simple message object that represents an "intention" to do something

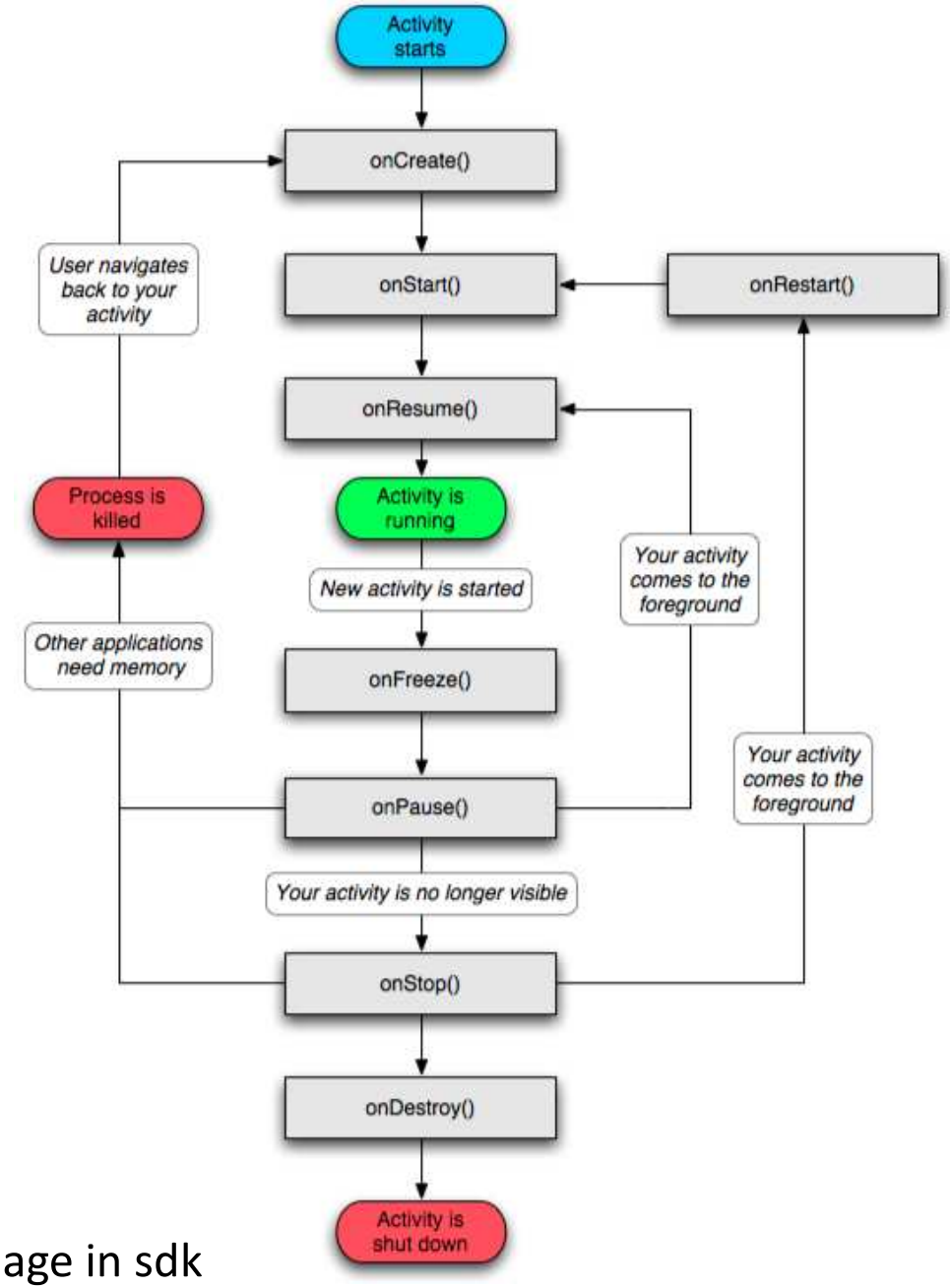
- Notifications
  -is a small icon that appears in the status bar(SMS messages)
  -for alerting the user

- Services
  -is a body of code that runs in the background

Standard components form building blocks for Android apps



Activity is one thing you can do



From fundamentals page in sdk

Android GUI

§ Java 1.5 support

§ GUI is fully written in Java

§ but it is not AWT / Swing

§ and neither J2ME LCDUI

§ Widget toolkit

§ XML based GUI

§ (Touch) screen

§ Might have a keyboard

Life Cycle of an Android Application

- **An unusual and fundamental feature** - process's lifetime is *not* directly controlled by the application itself

  Deciding factors:
  - how important
  - overall memory available

- To determine which processes should be killed when low on memory: **"importance hierarchy“**

“Importance Hierarchy”

- Foreground Process -required for what the user is currently doing

- Visible Process -holding an **Activity** - visible to the user on-screen but not in the foreground(on **pause**)

- Service Process -holding a **Service** - not directly visible to the user-relevant tasks

- Background Process -holding an **Activity** - not visible to the user - can kill at any time(**stopped**)

- Empty Process -doesn't hold any active application components(as a **cache** to improve start-up time)

Applications

Phone, Email, SMS, Web, Gaming, Maps, Social Network

Conclusion

- Android is **open** to all: industry, developers and users
- Participating in many of the successful open source projects
- Aims to be as **easy** to build for as the **web**.
- Google Android is stepping into the next level of Mobile Internet

Thank you For your Attention