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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
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 stack

**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

- **Notifications**: Has life-cycle
- **Activity**: screen
- **Views**: App to handle content
- **Intents**: Background app like music player
- **Service**:
- **manifest**: Other applications
- **ContentProviders**:
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