

MOBILE OSS, DEVELOPMENT ENVIRONMENTS, IOS AND ANDROID

Lesson 05

Android

ANDROID

- Popular OS for smartphones, phablets, and tablets
- Its core layer based on Linux, Apache server, and General Public License (GPL) source codes
- Enables users to customize their devices to suit their specific needs

SOFTWARE COMPONENTS

- Storage access framework.
- Unified UI for picking files, DocumentsProvider class extends by implementing a content provider and implements an intent filter that accepts the PROVIDER_INTERFACE action (“Android.content.action.DOCUMENTS_PROVIDER”).

SOFTWARE COMPONENTS

- Multi-touch.
- Android transition framework, which provides the APIs that facilitate animations between different states (scenes) of UI and TransitionManager APIs.
- Multitasking.

SOFTWARE COMPONENTS

- SMS, MMS, SMS apps version for KitKat.
- Web browsing using WebKit and JavaScript engine for Chrome Version and Flash

ANDROID RUN-TIME (ART)

- A method of running the apps in which ahead-of-time compilation of apps is on native machine code
- The code installs on a user's device (ARM or MIPS or x86) when tasks execute at run-time on the Dalvik VM in place of just-in-time compilation when using Java virtual machine (JVM)

SPECIALIZED VIRTUAL MACHINE

- Java codes of Android execute in a specialized virtual machine (VM) implementation, which is designed for the mobile devices of Google

DALVIK VM

- Save as Dalvik byte codes file with extension. dex (Dalvik EXecutable) or an optimized Dalvik Executable (odex) file
- Run the code on the native machine or device.

DALVIK AND JVM DIFFERENCE

- Lies in the use of register-based architecture in place of only stack-based architecture with no registers for generating byte codes when using JVM
- Creation of multiple VM instances in Dalvik.)

ANDROID CHARACTERISTICS

- Characteristics of Android are Google applications, support to flash player, and Android-specific apps (for example, ASTRO File Manager, Task Killer, and others). Android is open to the carriers (companies and service providers), which means it is open to different companies, such as Samsung, HTC, and HP.

ANDROID OREO

- A modular architecture
- A hardware designer delivers the Android updates easier and faster
- Low-level, vendor-specific code for supporting a device's hardware is separated from the Android OS framework using a hardware abstraction layer

SEEMLESS UPDATES

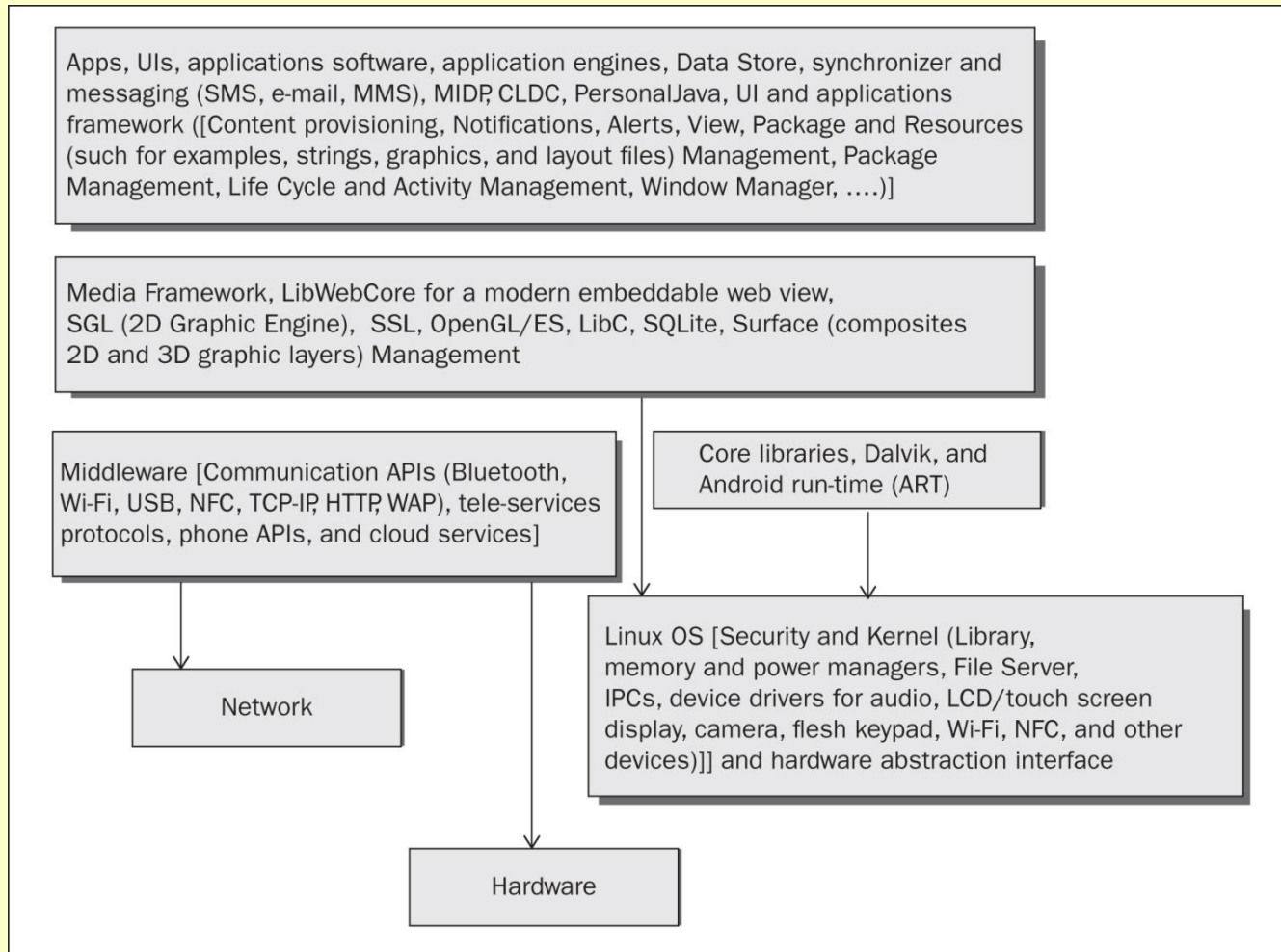
- concept updated to download update files directly to the system partition
- Reduces the storage space requirements for the system updates

- Notification improvements and provisions for Notification dots (badges). Notifications can be snoozed, Notifications can be batched into topic-based groups known as channels
- Picture in Picture

ANDROID OS

- Four abstract layers
- First layer for basic services
- Second for core libraries, Davik, ART, Middleware Communication APIs services
- Third the media layer
- Fourth the application layer

ANDROID OS ARCHITECTURE



FEATURES

- Canvas hardware acceleration, higher performance, vibration API, HTML5 with form validation, and DataList
- Storage access framework (SAF) has an API, which enables the apps to retrieve the files in a consistent manner, and has new file picker for files from multiple sources

FEATURES

- All clock digits thin
- Apps UIs maintain the status and navigation bars are hidden.
- New framework for UI transitions.
- Wireless printing.
- NFC host card emulation in place of smart card

FEATURES

- HTML 5 support.
- Open source Web browser.
- WebKit application framework.
- Google Search.Google Maps 3.1.2 and higher.
- Google Play Services.
- Google Cloud **Messaging**

FEATURES

- OpenGL graphics.
- Animations between screens.
- Accelerated 2D bitblits (with hardware orientation, scaling and pixel format conversion, and antialiasing).
- Accelerated 3D graphics

FEATURES

- Most common industry standards video and audio, for example, H.264 (AVC), MP3, and AAC.
- Global positioning system (GPS) and location (GPS or cell towers triangulation) based services, Accelerometer, Magnetometer, Picture camera.

FEATURES

- Camera controls with digital zoom, scene mode, white balance controls, macro focus, and colour effects.
- Video camera in camcorder mode supports video recording and playing FM tuner.

ANDROID APPLICATION DEVELOPMENT

- Download the software components from <https://developer.Android.com/index.html> for development. Android SDK requires installation of Java SE Development Kit (JDK) — (www.oracle.com/technetwork/java/javase/downloads/index.html)

IDE

- An IDE Eclipse (www.eclipse.org/downloads/packages/eclipse-ide-java-eedevelopers/heliossr1)
- IDE in an appropriate version (Windows or Mac Cocoa or Linux 32- or 64-bit versions) enables the use of multiple languages. Java, Ada, C, C++, COBOL, Python

IDE

- Enable use of other development languages for coding Android apps
- Eclipse IDE extends to Android development tools (ADT) plug-ins
- ADTs are extensions to the Android environment
- ADTs provide an extensible plug-in system

SUMMARY

- Android core layer based on Linux, Apache server, and General Public License (GPL) source codes
- Four abstract layers, for basic services, for core libraries, Davik, ART, Middleware Communication APIs services, for the media and for the apps

... SUMMARY

- Java, HTML 5 and Open GL
- App Development platform downloadable
- Android IDE from Eclipse

End of Lesson 05

Android