

Guidelines Unit I

Brief History : In three short years, Android has become the most popular OS on mobile phones in the United States. In the spring of 2011, a Nielsen survey concluded that Android controlled 36 percent of the market, followed by Apple iOS at 26 percent (Feb-Apr 2011 Nielsen Mobile Insights, National). Estimates are that by the end of 2012, Android will control 50 percent of the global smart phone market, the other 50 percent being divided among all other systems. In February 2010, CBS reported that the worldwide number of mobile phone subscriptions was 4.6 billion, and that was expected to grow to 5 billion during 2010. 2011 estimates are 5.6 billion mobile subscriptions worldwide, 77 percent of the population, with the largest growth in China and India.

So, what is Android, and where did it come from?

- In August 2005, Business Week reported that Google acquired Android, Inc., a 22-month-old start-up, which signaled Google's push into the wireless market. In 2007, Google and several other industry giants such as Motorola, Toshiba, Texas Instruments, and T-Mobile, just to name a few, formed the Open Handset Alliance. The alliance members released a significant amount of intellectual property into open source and released the Android platform.
- In September 2008, T-Mobile released the G1, the first smart phone based on Android. It ran Android 1.0, the world's first open-source mobile OS.
- In April 2009, Android 1.6 added Google Maps. That same year Motorola released the Droid mobile device.
- The next significant release was Android 2.2, nicknamed Froyo (short for Frozen Yogurt), which offered an OS tune-up for speed, USB tethering for WiFi hot spots, and support for Adobe Flash 10.1 for watching videos on the built-in browser.
- In 2010, Motorola released the Backflip and the Droid X, and T-Mobile released the G2. In February 2011, Android released 3.0, the made-for-tablet installment.

- The Android platform, based on the Linux OS, is designed to be a general-purpose handheld computing platform. The Linux core controls the mobile device's memory, internal devices, and processes. The Android libraries control telephony, video, graphics, and the user interface.
- Like any Linux system, the Android OS is a multiuser system in which each application is treated as a different user with a unique user ID. The OS sets permissions on files based on the application's ID so that applications have access to the necessary files.
- The Android software development kit (SDK) supports most of the Java Standard Edition. However, Android replaces the Java abstract windowing toolkit (AWT) and Swing packages with its own user interface (UI) framework.
- The popularity of the Java programming language, along with the extensive class library associated with the ADK, makes it an attractive development platform.
- As you might expect as a Java programmer, each application runs on its own Java virtual machine (JVM). Android supplies its own optimized JVM called the Dalvik virtual machine.
- Android applications are composed of one or more of four types of core components. These are activities, the base of all of the examples; services; content providers; and broadcast receivers.
- Applications can request services from the device's built-in components, such as the camera and networking components, but requests for these services are added to a "manifest file" at application design and development time. At application install time, the user of the device will respond to requests for services listed in the manifest, either granting or denying the request.
- **Activity**—Represents a single screen and user interface. During application development, an activity is written as a single Java class, with the application's main class extending the Android development kit's Activity class. Although activities are independent of one another, they are allowed to work together with one activity initiating another.

- **Service**—A process that runs in the background to perform long-term operations or work for remote processes, not unlike daemons on Linux-based computers or services on Windows-based computers. Services do not provide a user interface. A service, for example, might be used to download data in the background, allowing the user of an application (activity) to interact with that application without delay. The developer creates a service as a subclass of the Android Service class.
- **Content provider**—Manages persistent data on the device or external sources such as the web or cloud, or any other system the application has access to. You can think of content providers as the file managers for the system. For instance, Android devices have an on-board SQLite database management system to provide organized persistent data storage. Another example is the device’s contact list, which applications can access if they have permission.
- **Broadcast receiver**—A component that responds to system conditions such as low battery or the screen being turned off. You can use broadcast receivers to initiate a response from a running application, such as if a picture has been taken. A broadcast receiver that a developer writes is implemented as a subclass of the Android BroadcastReceiver class.
- A unique benefit of the Android system design is that one application can start another application’s components, whether written by the developer or a third party or built into the system. For instance, a developer can write an application that uses the device’s phone dialer, and it will appear that the phone was built into the developer’s own application. Because each of the application types listed runs as a separate process with its own file permissions, one activity requests access to another through an Intent. The way the Intents will respond to activities is determined at design time by employing “Intent filters” that are set in the application’s manifest file.
- The relative ease of programming in Java, coupled with the cooperative features of the Android OS and the gargantuan user base of Android devices, creates an attractive opportunity to earn income from application development.

- **Caution** Unlike other platforms, Android applications can be distributed and installed through direct-connect to the computer the application was developed on or even as an email attachment.
- In conclusion, the array of features contained in the Android OS, along with the rich development set offered by both the Java and Android development kits, offers the developer mobile computing solutions and an array of distribution channels and options to allow their deployment.
- You can find complete documentation of the ADK at <http://developer.android.com>. The packages, classes, and interfaces are described in standard java-doc style under the Reference tab on the web pages.