Chapter 1

Android Architecture

Google entered the mobile phone market in a style that only multibillion-dollar companies can afford: it bought a company. In 2005, Google, Inc. purchased Android, Inc. At the time, Android was relatively unknown, despite having four very successful people as its creators. Founded by Andy Rubin, Rich Miner, Chris White, and Nick Sears in 2003, Android flew under the radar, developing an operating system for mobile phones. With a quest to develop a smarter mobile phone that was more aware of its owner's preferences, the team behind the Android operating system toiled away in secrecy. Admitting only that they were developing software for mobile phones, the team remained quiet about the true nature of the Android operating system until the acquisition in 2005.

With the full might of Google's resources behind it, Android development increased at a rapid pace. By the second quarter of 2011, Android had already captured nearly a 50% market share in mobile phone operating systems shipped to end users. The four founders stayed on after the acquisition, with Rubin taking the lead as Senior Vice President of Mobile. The official launch of version 1.0 of Android took place on September 23, 2008, and the first device to run it was the HTC Dream (see Figure 1-1).

S. Gunasekera, *Android Apps Security*

Figure 1-1. *An HTC Dream (Courtesy Michael Oryl)*

One of the unique features of the Android operating system that has allowed it to grow rapidly has been that the binaries and source code are released as open source software. You can download the entire source code of the Android operating system, and it takes up approximately 2.6 GB of disk space. In theory, this allows anyone to design and build a phone that runs Android. The idea of keeping the software open source was followed until version 3.0. Versions of Android including and higher than 3.0 are still closed source. In an interview given to *Bloomberg Businessweek*, Rubin said that the version 3.x code base took many shortcuts to ensure it was released to market quickly and worked with very specific hardware. If other hardware vendors adopted this version of Android, then the chances for a negative user experience would be a possibility, and Google wished to avoid this.[1]

Components of the Android Architecture

The Android architecture is divided into the following four main components (see Figure 1-2):

1. The kernel
2. The libraries and Dalvik virtual machine
3. The application framework
4. The applications

[1] *Bloomberg Businessweek*, "Google Holds Honeycomb Tight," Ashlee Vance and Brad Stone, www.businessweek.com/technology/content/mar2011/tc20110324_269784.htm, March 24, 2011.