Includes Android L (5.0)

Get started with building your very own Android apps

Android Apps for Absolute Beginners

THIRD EDITION

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Contents at a Glance

Introduction

The Android OS is currently the most popular operating system in the world. The Android OS runs on everything from smartwatches to HD smartphones to touchscreen tablets to ebook readers to game consoles to smartglasses to ultra-high definition interactive television sets!

There are even more types of consumer electronics devices—such as those found in automotive, home appliance, security, robotics, photography, industrial and home automation markets—that are adopting the open source Android OS as their platform as time goes on. This book will show you how to develop applications for these new device type verticals as they emerge into the market.

Since there are literally billions of Android consumer electronics devices owned by billions of people all over the world, it stands to reason that developing great Android applications for all these people might be an extremely lucrative undertaking, assuming that you have the right concept and design.

This book will help you go a long way toward learning how to develop Android applications that will run across all types of Android-compatible consumer electronics devices, and across all popular versions of the Android OS, most recently the 32-bit Android 4 OS and the new 64-bit Android 5 OS.

Developing an Android application that works well across all of these types of consumer electronics devices requires a very specific work process, which I cover in this book.

I wrote *Android Apps for Absolute Beginners, Third Edition* from scratch, targeting those readers who are absolute beginners to Android yet are technically savvy, but who are not familiar with computer programming concepts and techniques.

Since 32-bit Android is currently using Version 4.4.4, this book will be more advanced than *Android Apps for Absolute Beginners, First Edition*, when Android OS Version 1.5 was released by Google for smartphones, or *Android Apps for Absolute Beginners, Second Edition*, when Android OS Version 3.0 was released for tablets. Since then, five revisions of the 32-bit Android OS Version 4.x have been released, including 4.0, 4.1, 4.2, 4.3, and 4.4, targeting all new iTV set and game console products.

Since the **64-bit Android 5.0 OS** was announced during the writing of this book, and is currently in beta, I will also include an advanced chapter at the end of this book called "**The Future of Android: The 64-bit Android 5.0 OS**." This comprehensive Android 5.0 chapter will cover what you can expect when 64-bit Android 5.0 smartphone devices are released during 2014, as well as when 64-bit Android 5.0 game consoles, tablets and iTV sets are released during 2015 and into 2016.

The first edition of this book was a mere 300 pages, as Android 1.5 was the first version to appear on Android hardware devices (smartphones), and a second edition of this book was 33% longer, at 400 pages. I've expanded this version of the book to include nearly 700 pages of information, the size of the first two editions combined. This third edition even contains chapters that cover how to develop for Android wearable devices, such as the popular Neptune Pine smartwatch, as well as covering the new Android Wear SDK using the new Android Studio and IntelliJ IDEA. This book also covers how to develop for rapidly emerging Android appliances using the new Android TV SDK.

I designed this book to be a more comprehensive overview of the Android application development work process than most beginning Android application development books, because, at this point, there is really no way to "sugar coat" the Android application development process. To become the leading Android application developer that you seek to become, you will have to understand, as well as master, XML mark-up, user interface design, Java programming, and new media content creation. Once you have done this, hopefully by the end of this book, you will be able to create the vanguard user experiences required to create those popular, best-selling Android applications.

Android apps are currently developed for 32-bit Android 4 with Eclipse ADT Integrated Development Environment (IDE) or for 64-bit Android 5 using IntelliJ IDEA. Android applications are not developed via IDE alone, but also in conjunction with several other genres of new media content development software packages. For this reason, this book covers a wide variety of popular open source software packages, including GIMP 2.8, Planetside Terragen 3.1, Sorenson Squeeze Pro 9, VirtualDub 1.9, and Audacity 2. These professional new media content production tools should be utilized in conjunction with developing your Android 5 applications, and this book will show you exactly how to accomplish this, as well as how to download, install, update, configure, and actually use each of these programs.

This comprehensive Android 4/5 application development work process will allow you to experience exactly how the use of all of these multimedia content development software packages needs to fit into your overall Android application development work process. This 100% comprehensive "soup to nuts" multimedia-centric Android app development approach sets this 32-bit Android 4.x and 64-bit Android 5 book title distinctly apart from all of the other Android application development titles that are currently on the market. This book covers the Android development process at a broader level.

Chapter 1 starts by covering downloading and installing the current Java SE 6 and Android 4.4 SDK as well as the Eclipse IDE and the Android ADT bundle, along with several popular open source content development applications. In Chapter 2, you will configure your Android 4 application development workstation, and in Chapter 3, you will create a basic Android 4.4.4 application. You will be adding more and more functionality to that basic Android application during the remainder of the book, as well as converting it into an Android 5 app during the final chapter of the book covering Android 5.

In Chapter 4, you learn all about the XML markup language, and in Chapter 5, you learn all about the Java SE programming language. Thus, the first third of this Android book is foundational material, which explains how the Android OS works together as a whole. In Chapters 6 through 8, you learn about the fundamentals of user interface design in Android, and how to make UI designs interactive.

In Chapters 9 and 10 you will learn about graphics design and 2D animation in Android, and how to use new media content production software in conjunction with Android development software and IDEs. In Chapters 11 and 12, you will learn how to implement digital audio new media assets as well as how to stream digital video new media assets from your remote video servers.

In the final four chapters of this book, you will learn about some of the more advanced development topics that normally would not be included in an Absolute Beginner title, but I included them so that all of the important topics regarding Android application development are in this one, single, unified book. These included advanced topics including threads, processes and databases, developing apps for smartwatches and iTV sets, and everything you would want to know about the new 64-bit Android 5 OS, including how to set it up, how to develop Android 5.0 applications, and all of its new features.

In Chapter 13, you will learn all about threads, Services and background processing for Android using the **Service** class, and in Chapter 14 you'll learn about RDBMS database theory and SQLite databases in Android, as well as how to use the Android **Content Provider** classes to access built-in databases.

In the last two chapters in this book, you'll dive into the future of Android application development, by developing applications for Android wearables and Android appliances, and learning all about Android 5.0. Chapter 15 covers how to develop Android applications for wearable devices and the Wear SDK, and Chapter 16 covers how to develop Android applications for Android appliances such as the iTV set using the Android TV SDK and the new Android 5.0 OS and Android Studio Bundle based on the IntelliJ IDEA and Java 7 on top of an all new 64-bit Linux Kernel and the new ART Android RunTime.

This book attempts to be the most comprehensive Absolute Beginners book for Android application development out there, by covering most, if not all of, the major Android classes that will need to be used to create leading-edge 32-bit Android 4.x and 64-bit Android 5.x software applications.

Some of these classes include the **View**, **ViewGroup**, **Activity**, **Menu**, **MenuItem**, **OptionsMenu**, and **ActionBar** classes, used for GUI and screen designs, the **FrameLayout**, **LinearLayout**, **RelativeLayout**, **GridLayout**, **TableLayout**, and **SlidingPaneLayout** classes, which are used for user interface designs, the **ImageButton**, **ImageView**, **NinePatch**, **NinePatchDrawable**, **BitmapDrawable**, **Animation**, **AnimationDrawable**, and **AnimationSet** classes, which are used for graphics design and animation, the **SoundPool**, **VideoView**, **MediaPlayer**, **Uri** and **MediaController** classes, which are used in digital audio and digital video applications, and finally, the **Service**, **Thread**, **Context**, **ContentProvider**, and **ContentResolver** classes, used for database access and more complex background processing tasks.

If you are looking for the most comprehensive, up-to-date overview of the latest 32-bit and 64-bit Android OSes, including Eclipse ADT (Android Developer Tools) IDE on top of Java SE 6, and IntelliJ (Android Studio) IDEA on top of Java SE 7, this is the book that covers the entire gamut.

This Android title covers everything regarding the XML markup langauge and the new media content development work processes which spans across both 32-bit as well as 64-bit Android development, as well as detailed knowledge about how to optimally use Android app technologies with the leading open source new media content design and development tools.

If you are looking for the latest Android title that covers everything about Android from the first version that Google released (1.5) up to the current version (5.0) and how to assilimate these app development technologies into your current content production workflows, this *Android Apps for Absolute Beginners, Third Edition* book will be of significant interest to you.

It is the intention of this book to take you from being an "Absolute Beginner" in Android application development, to having a comprehensive, solid, intermediate knowledge of both 32-bit Android 4.4 and 64-bit Android 5.0 application development.

You should be advised that this book contains a significant amount of technical knowledge and work processes that may take more than one read-through to assimilate into an application development knowledge base (your current Android knowledge "quiver of arrows" so to speak). This vast journey through 32-bit Android 4.x and 64-bit Android 5 will be well worth your time, however; rest assured.

Chapter 1

Setting Up Your Android App Development System

These days, you see Android devices of every size and shape everywhere you look. They can be worn on your person, used in an appliance, are a part of your car, or provide you entertainment in your living room taking the form of an iTV set, a tablet, eBook reader, or an Android game console.

In this chapter, we will explore some basic facts about the Android operating system (OS), to give you a high-level overview of the history of Android, the benefits of learning Android application development, and which open source programming languages and OSs Android is based upon.

We will also need to get all of the tedious searching and downloads out of the way regarding to how to go about obtaining all of the various software packages, SDKs, and components, which together form a comprehensive **Android production workstation**.

Even though this is an "Absolute Beginners" Android title, I want to teach you how to put together a pro Android development workstation, so that you are all ready to get into the various *Pro Android* series of books from Apress (after you finish mastering this book, of course).

So that everyone experiences this book equally, this chapter will outline all the steps to obtain a completely decked out Android development workstation.

The History of the Android OS: Impressive Growth

Android OS was originally created by **Andy Rubin** as an OS for mobile phones; this happened around the dawn of this 21st century.

In 2005, Google acquired Android Inc., and made Andy Rubin the Director of Mobile Platforms for Google. Many think this acquisition of the Android OS by Google was largely in response to the appearance of Apple's iPhone around that same time. However, there were enough other large players, such as RIM Blackberry, Nokia Symbian, and Microsoft Windows Mobile, that it was deemed to be a savvy business decision for Google to purchase Android engineering talent and

Android OS intellectual property, allowing Google to insert their company into this emerging market, which was known as **Internet 2.0**.

Internet 2.0, or the **Mobile Internet**, allows users of consumer electronic products to access content via widely varied data networks, using portable consumer electronic devices. These currently include tablets, smartphones, phablets (phone-tablet hybrid), game consoles, smartwatches, smartglasses, personal robots, and eBook eReaders.

These days, Android OS–based devices can also include those not-so-portable consumer electronics devices, such as iTVs, home media centers, automobile dashboards and stereos, and digital signage system set-top boxes.

This ever-growing Android phenomenon puts new media content such as games, 3D animation, interactive television, digital video, digital audio, eBooks, and high-definition imagery into our lives at every turn.

Android is one of those popular, open source vehicles (the other one being HTML5) that digital artists will increasingly leverage in order to be able to develop new media creations that users have never before experienced.

Over the past decade, Android has matured and evolved, to become a stable, exceptionally reliable, embedded open source OS. An Android OS that started out with its initial Version 1.0 just a few years ago, once acquired by Google, has released stable OS versions at 1.5, 1.6, 2.0, 2.1, 2.2, 2.3, 3.0, 3.1, 3.2, 3.3, 4.0, 4.1, 4.2, 4.3, and, recently, the much-heralded KitKat Android version 4.4, currently at Version 4.4.4. As of the writing of this book, Android 5.0 is in beta at version 0.8.0, so that should show up in 64-bit Android devices in 2015 and 2016.

If you want to see the latest statistics regarding each of these Android OS revisions, directly from the Android developer web site, visit this URL:

http://developer.android.com/about/dashboards/index.html

Table 1-1 shown this progression of all the popular versions of Android OS that have been installed on the popular consumer electronics manufacturer products over the past decades. I wanted to collect all of this Android OS information together into one single infographic for you so that you could get a "bird's eye" view of the current historic progression of the Android OS. As you can see, there are certain Android market share "sweet spots."

Table 1-1. Android Versions, Internal Codenames, API Levels and Market Share

VERSION	CODENAME	API LEVEL	MARKET SHARE
1.5	Cupcake	3	0.1%
1.6	Donut	4	0.1%
2.1	Eclair	7	0.2%
2.2	Froyo	8	0.2%
2.3.7	Gingerbread	10	14.9%
3.2	Honeycomb	13	0.2%

(*continued*)

Table 1-1. (*continued*)

VERSION	CODENAME	API LEVEL	MARKET SHARE
4.0.4	Ice Cream Sandwich	15	12.3%
4.1.2	Jelly Bean	16	29.0%
4.2.2	Jelly Bean Plus	17	19.1%
4.3.1	Jelly Bean Plus	18	10.3%
4.4.4	Kit Kat	19	13.6%
5.0	L	20	0.0%

In case you are wondering what an **embedded OS** is, it is like having an entire personal computer on a motherboard, which is small enough to fit into a handheld consumer electronics device, and which is powerful enough to run applications (which are commonly known simply as apps).

Just like today's personal computers and laptops, the Internet 2.0 devices such as smartphones, tablets, eReaders, smartwatches, and iTVs now feature quad-cores (4 CPUs) and even octa-core (8 CPUs) computer processing power, as well as one or two gigabytes of system memory. This is approaching the power of a modern day PC, such as the workstation you are going to set up during the next chapter of this book, which you can get for $300 at WalMart. The mini-tower PCs feature quad-core 64-bit processors along with 4GB or 6GB of system memory, and a 500GB hard disk drive with Windows 8.1.

The Android OS contains the power of a complete computer OS. It is based on the **Linux Kernel** open source platform, and Oracle (formerly Sun Microsystems) **Java 6 Standard Edition**, one of the world's most popular programming languages. Android 5, coming out in products next year, will use a 64-bit Linux Kernel, and Java 7.

Note The term **open source** refers to software that has often been developed collaboratively by an **open community** of individuals, and is **freely available** for **commercial use**. Open source software comes with all of the **source code**, so that it can be further modified if necessary. The Android OS is open source, though Google develops it internally before releasing the source code. From that point on, it is freely available for commercial use by app software developers.

It's not uncommon for an Android device to have a 1.2GHz processor and 1GB of fast, computer-grade DDR3 memory. This rivals desktop computers of just a few years ago, and netbooks that are still currently available. You will continue to see this convergence of Internet 2.0 (mobile device) OSs with desktop OSs, such as we are seeing with Windows 8.1 and Google Chrome OS currently, as time goes on.

Once it became evident that Java, the Android OS, and open source software platforms were vanguard forces to be reckoned with, a bunch of the popular consumer electronics manufacturers, including Philips, Sony, HTC, Samsung, LG Electronics, and T-Mobile, formed, and joined the **Open Handset Alliance** (OHA). This was all done in order to put the momentum behind Google's open source Android platform, and it worked! Today, hundreds of leading branded consumer electronics manufacturers leverage Android as an OS on their consumer electronic devices. In fact, Android OS is used more than any other OS that has ever existed on the face of the earth.

This development of the OHA is a significant benefit to Android developers. Android allows developers to create their applications using a single IDE, or integrated development environment, and now this support by the OHA can enable developers to deliver their content across dozens of major branded manufacturers' hardware products as well as across several different types of consumer electronic devices, including smartphones, iTV sets, e-book e-readers, smartwatches, smartglasses, home media centers, settop boxes, and touchscreen tablets.

The Android OS affords its developers a plethora of powerful content delivery tools and platform support and device playback possibilities, to say the least! But then again, you must have realized this yourselves, as you are reading this book right now, so you can get in on all that power!

In summary, Android is a seasoned OS that has become one of the biggest players in computing today, and with Google behind it. Android uses freely available open source technologies such as Linux and Java, and open standards such as XML, CSS, MPEG, JPEG, PNG, MP3, WebM, WebP, OpenGL, WebKit, and HTML5. Android incorporates all of these open source resources so that it can provide the free new media content and application delivery platform to Android developers, and an OS platform to consumer electronics manufacturers. Can you spell OPPORTUNITY? I sure can: it's spelled **ANDROID**!

Advantage Android: How Can Android Benefit Me?

There are simply too many benefits for the Android OS development platform to ignore your Android applications development workflow, and environment, for even one minute longer. We are going to get you all of the latest apps and OS SDKs and components during this chapter so you'll have a valuable PC!

First of all, Android is based on open source technology, which was at its inception not as refined as paid technologies from Apple and Microsoft.

However, over the past several decades, open source software technology has become equally as sophisticated as conventional software technologies. You will soon see this with your professional level new media content software that you will be acquiring (for free) during the remainder of this chapter.

This is clearly evident with Internet 2.0, as the majority of the consumer electronics manufacturers have chosen Linux and Java over the Windows, iOS, and Macintosh OSs.

For this key reason, Android developers can develop applications not only for their smartphones, but also for new and emerging consumer electronics device ecosystems that include never-before-seen products such as glasses and smartwatches and 4K UHD iTVs that are network-compatible and available to connect to an Android Marketplace. The Android Marketplace was recently re-branded by Google as Google Play due to a lawsuit brought by Apple.

This translates to more sales on more devices in more areas of a potential customer's life and thus offers more incentive to develop for Android over closed technologies such as Windows and iOS and over less popular and less prolific PC OSs.

In addition to being free for commercial use, the Android OS has one of the largest, wealthiest, and most innovative companies in modern-day computing behind it: Google. Add in an OHA and you have more than a trillion dollars of megabrand companies behind you, supporting your development efforts. It certainly seems too good to be true, but it's a fact; if you're an Android developer (which you are about to be, in about a dozen and a half chapters), then you now have a supreme hardware and software sales and support team behind you.

Finally, and most importantly, it's much easier to get your Android applications published than those for other platforms that are similar to Android (I won't mention any names here, to protect the not-so-innocent).

We've all heard those horror stories regarding major development companies waiting months, and sometimes years, for their apps to be approved for the app marketplace. These problems are nearly non-existent on the open source Android platform. Publishing an app on the Google Play Android Marketplace is as easy as paying $50, uploading your Android .apk file, and specifying whether you are offering a free or a paid download.

The Scope of This Book

This book is an introduction to developing applications for Android. It is intended for absolute beginners; that is, people who have never created an application on the Android platform for a consumer electronic device. I do not assume that you know what Java is, or how XML works, or what styles or themes are, or what a codec, an alpha channel, color dithering, or an anti-aliasing algorithm is.

All I know is that by the end of this book, you're going to appear as if you are speaking a foreign language when you start talking about new media Android application development in front of friends, family, and clientele, which ultimately will get you hired, and hopefully well paid!

What is Covered in This Book

This book covers the basic and essential elements of Android application development, including but not limited to the following areas:

- The open source tools required to develop for this platform
    - Where to get this free software development environment, as well as professional new media content creation tools
    - How to properly install and configure the necessary tools for application development as well as new media creation
    - Which third-party tools are useful to use in conjunction with the Android development tools (ADT)
    - Which OSs and platforms currently support development for the Android using these tools

- The concepts and programming constructs for Java and XML, and their practical applications in creating Android applications
- How Android goes about setting up an Android application
    - How it defines the application user interface components
    - How it addresses and writes graphics to a display screen
    - How it can communicate with other Android applications
    - How it interfaces with data, resources, networks, and the Internet
    - How it alerts users to events that may be taking place, inside of and outside of your Android application
- How Android applications are published using the app Manifest
- How Android applications are ultimately sold, downloaded, and updated automatically through Google Play Android Marketplace

Realize that Android OS has more than 44 Java packages, which contain functionality that allows you to do just about anything imaginable, from putting a UI button on the display screen, to synthesizing speech, or accessing advanced smartphone features such as the high-resolution camera, Bluetooth, GPS, Gyro, Compass, or Accelerometer.

> **Note** A package in Java is a collection of programming utilities or functions that all have related (and interconnected) functionality. For example, the **java.io** package contains utilities that deal with input and output (IO) to your program, such as reading the contents of a file, or saving data to a file. Later chapters describe how to organize your own Android Java code, into your own custom packages.

What does the plethora of Android Java code mean for an Absolute Beginner?

It means that even the most advanced pro Android books can't all cover the plethora of amazing things that this Android OS platform can accomplish!

In fact, most Android books will specialize in a specific area of an Android API. An API is an application programming interface, or a collection of programming code routines that allow software development. We will be learning about APIs in Chapter 5. There is plenty of complexity in each API, which ultimately, from the developer's viewpoint, translates into incredible creative power. What is the price of this power, you might ask. Your time spent in mastering each API is the only price you'll pay, as the Android OS is otherwise free for commercial use.

What is Not Covered in This Book

So, what isn't covered in this book? What cool, powerful capabilities do you have to look forward to in the next level book on Android programming?

On the hardware side, we will not be looking at how to control the camera, access GPS data from the smartphone, and access the accelerometer, or the gyroscope, which allow the user to turn the smartphone around and have the application react to the smartphone position. We will not be delving into advanced touchscreen concepts such as gestures, or accessing other device hardware, such as the microphone, Bluetooth, or wireless connections.

On the software side, we will not be diving into creating your own Android MySQLite Database Structure, or Android's real-time 3D rendering system (called OpenGL ES 3.1), although we will take a closer look at these areas so that you know how to utilize them, and how they fit into the overall Android OS infrastructure.

We will not be exploring speech synthesis and speech recognition, nor the universal language support that allows developers to create applications that display characters correctly in dozens of international languages and foreign character sets.

We will not be getting into advanced programming such as game development, artificial intelligence, image compositing pipelines, blending modes, and physics simulations. All of these topics are better suited to books that focus on these complex and detailed topical areas, such as the Apress *Pro Android Graphics* and *Pro Android UI* titles.

Assembling Your Android Development Workstation

In this section, I will outline the broad overview of what's needed to put together a complete Android development workstation that you can utilize throughout this book to create cool Android apps.

The first thing that you'll do is get the entire Java software development kit (SDK), which Oracle calls **JavaSE 6 JDK** (Java Development Kit). Android OS uses Java Standard Edition (SE) Version 6 update 45, as of Android 4.4.

> **Note** Java Version 7 also exists, and is in parallel release with Java6, at Java7 u45. In the second quarter of 2014, there will be a Java Version 8 released, which will include powerful JavaFX APIs that turn Java programming language into a powerful new media engine. Thus, the future of open source development (Android OS, Java8, XML, HTML5) is here! In fact, Android 5.0, which should be available in 64-bit consumer electronics products in 2015 and 2016, uses Java 7 and a 64-bit version of the Linux Kernel!

The second thing that we will download and install is the Android Developer Tools (ADT), which we will get from Google's **developer.android.com** web site.

ADT Bundle 4.4 consists of the **Eclipse 4.4 IDE** (integrated development environment), along with the **ADT 4.4 plug-ins,** which **bridges** the **Android SDK** that is also part of the ADT Bundle download, with the Eclipse 4.4 IDE. This makes the Eclipse Java IDE into an Eclipse Android ADT IDE, essentially, although it could still be used for straight JavaSE 6 application development as well. An IDE is an integrated development environment, like a word processor tuned for writing programming code.

After your core Android development environment is downloaded, you'll then download and install external **new media asset development** tools, which you will utilize in conjunction with Android for things such as UI wireframing (Pencil), digital image editing (GIMP2), digital audio editing (Audacity), digital video editing (Lightworks), 3D modeling and animation (Blender3D), and even running your Android development business (Apache Open Office 4.1).

All of these software development tools, which you will be downloading and installing, will come close to matching all of the primary feature sets of the expensive paid software packages, such as those from Microsoft (Office and Visual Studio), Apple (Logic, Avid, FinalCut Pro X), Autodesk (Maya or 3D Studio Max), and Adobe (Photoshop CS6 and After Effects).

Each of these paid software packages would cost a couple thousand dollars each to purchase and maintain, so plan on paying ten thousand (your local currency unit here) to put together a similar paid software workstation to develop for the iOS or the Windows consumer electronics device platforms.

Open source software is free to download, install, and even upgrade, and is continually adding features, and becoming more and more professional, each and every day. You'll be completely amazed at how professional open source software packages have become over the last decade or two; if you have not experienced this already, you are about to, and in a very major way.

Android Development Workstation: Hardware Foundation

Since during the chapter you will put together what will be the foundation for your Android applications development system for the duration of this book, let's take a moment to discuss the Android development workstation's hardware configuration, as that's an important factor for your performance (speed of development), which is as important as the software itself.

This section will therefore cover a plethora of important systems hardware considerations that you should consider when assembling your workstation.

I recommend using at a bare minimum an **Intel i7 quad-core** processor, or an **AMD 64-bit hexa-core** processor, with at least **8GB** of **DDR3 1600** memory. I'm using the octa-core AMD 8350 with **16GB** of **DDR3 2000**. Intel also has a six-core i7 processor. This would be an equivalent of having 12 AMD cores, as each Intel core can host two threads; similarly, the i7 quad-core looks like 8 AMD cores to the OS thread-scheduling algorithm.

AMD has a 16-core processor as well, which is usually deployed inside of server architectures, but this CPU can be used in a client-side Android development workstation, which would greatly speed video compression or 3D rendering for your Android applications development.

There are also high-speed DDR3 1866 and DDR3 2000 clockspeed memory module components available. A high number signifies faster memory access speed. To calculate the actual megahertz speed at which memory is cycling, divide the number by **4** (1333=333Mhz, 1600=400Mhz, 1866=466Mhz, 2000=500Mhz clock rate). Memory access speed is the key workstation performance factor because your processor is usually "bottlenecked" by the speed at which the processor cores can access the data (in memory) that it needs to process.

With all this high-speed processing and memory access going on inside your workstation while it is operating, it is also important to keep everything cool so that you do not experience "thermal problems." I recommend using a wide **full-tower** enclosure, with **120mm** or **200mm** cooling fans (one or two at least), as well as a captive liquid induction cooling fan on the CPU. This type of CPU cooler has cooling tubes filled with water that touch the CPU and draw away heat, turning the water into steam, which rises up the tubes to the cooling fan, which cools this steam, condensing it back into water, which runs back down the pipe to cool the CPU. It's important to note that the cooler your system runs, the longer it lasts, and the faster it runs, which is important for Android application development.

If you really want the maximum performance, especially while emulating Android Virtual Devices (AVDs), which are used for app prototyping or testing, which you will learn about in the next chapter, using Eclipse, you'll want to make sure that your Android development workstation has a solid state disk (**SSD**) hard drive as its primary (C:\ "boot" drive) disk drive, from which your applications and OS software will launch.

You can always use more affordable hard disk drive (**HDD**) hardware for your D:\ (secondary) hard disk drive, for your data storage, which does not need the speed of operation as it is just used for long-term storage.

For my OS, I'm using a **64-bit Windows 8.1** OS, which is quite memory-efficient. Linux 64-bit OS is also extremely memory efficient. It's important to note that Windows 8.1 comes on most quad-core workstations in retail stores such as WalMart and Staples, and with an OS price of several hundred dollars if purchased separately, you could look at the hardware as being essentially free!

Android Development Workstation: Software Foundation

To create a well-rounded Android applications development workstation, you will be installing all of the primary genres of open source software covered later in this chapter, after you install JavaSE 6u45, Eclipse, and the ADT environment, which are also all the open source programming packages you'll need. Thus, we'll be putting together a 100% open source workstation for you (with the exception of your Windows 8 OS).

For those readers who have just purchased their new Android workstations, and who are going to put their Android development software suite together completely from scratch, I'll go through an entire work process during the rest of this chapter.

We will start with Java SE 6u45 as it is the foundation for Eclipse ADT as well as Android, and then we'll acquire the Eclipse ADT Bundle. After that, we'll search for and download your new media content development software, as well as user interface design software and a complete business software suite called Apache Open Office 4.1, originally created by Sun Microsystems, and acquired and made open source by Oracle, who owns the Java SE platform.

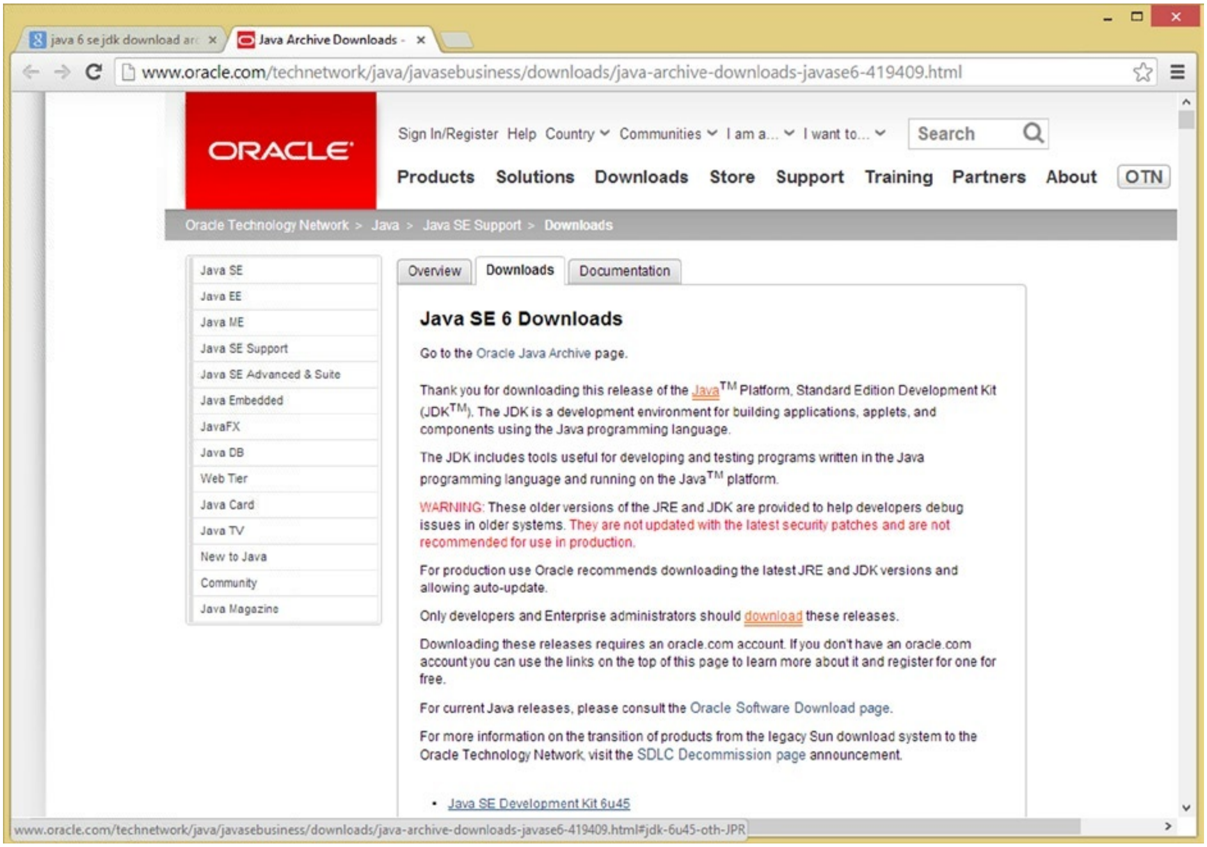
Java SE 6: Download and Install a Foundation for Android

Before you run a JavaSE installation, you should remove any older versions of JavaSE using your Windows **Control Panel**, via the **Add or Remove Programs** (XP) or Programs and Features (Windows 7 and 8.1) utility. To remove an older version of the Java JDK or Java Runtime Environment (JRE) select them and right-click on the selected entry and use the "Uninstall/Remove" option to un-install.

This will be necessary especially if your workstation is not brand new, so that only your latest Java SE 6u45 and JRE 6u45 are the sole Java versions that are currently installed on your new Android development workstation.

To install a new JDK:

1. The first thing that you will want to do is to visit **Oracle's Java Archive** web site, and download and install the latest **Java 6 JDK** environment, which at the time of writing this book was **Java SE 6u45**, as shown in Figure 1-1.


java 6 se jdk download ar
Java Archive Downloads -
www.oracle.com/technetwork/java/javasebusiness/downloads/java-archive-downloads-javase6-419409.html
ORACLE
Sign In/Register Help Country Communities I am a... I want to...
Search
Products Solutions Downloads Store Support Training Partners About OTN
Oracle Technology Network > Java > Java SE Support > Downloads
Java SE
Java EE
Java ME
Java SE Support
Java SE Advanced & Suite
Java Embedded
JavaFX
Java DB
Web Tier
Java Card
Java TV
New to Java
Community
Java Magazine
Overview
Downloads
Documentation

Java SE 6 Downloads

Go to the Oracle Java Archive page.

Thank you for downloading this release of the Java™ Platform, Standard Edition Development Kit (JDK™). The JDK is a development environment for building applications, applets, and components using the Java programming language.

The JDK includes tools useful for developing and testing programs written in the Java programming language and running on the Java™ platform.

WARNING: These older versions of the JRE and JDK are provided to help developers debug issues in older systems. They are not updated with the latest security patches and are not recommended for use in production.

For production use Oracle recommends downloading the latest JRE and JDK versions and allowing auto-update.

Only developers and Enterprise administrators should download these releases.

Downloading these releases requires an oracle.com account. If you don't have an oracle.com account you can use the links on the top of this page to learn more about it and register for one for free.

For current Java releases, please consult the Oracle Software Download page.

For more information on the transition of products from the legacy Sun download system to the Oracle Technology Network, visit the SDLC Decommission page announcement.

- Java SE Development Kit 6u45

www.oracle.com/technetwork/java/javasebusiness/downloads/java-archive-downloads-javase6-419409.html#jdk-6u45-oth-JPR

***Figure 1-1.** Oracle TechNetwork web site JavaSE6 Archive; scroll to the middle to find the JavaSE 6u45 JDK download*

The URL is in the address bar of Figure 1-1, or you can simply Google **Java SE 6 JDK Archive Download**, which will also give you the latest link to this web page, which I will also put here, in case you want to cut and paste it:

`http://www.oracle.com/technetwork/java/javase/downloads/java-archive-downloads-javase6-419409.html`

You can pull the scrollbar on the right side of the web page down the page, until you see the **Java SE Development Kit 6u45 Download** button, which you can see on the very bottom of Figure 1-1. The first link in the long list of version links is the latest revision of the Java SE JDK Development Kit and since you want to get the latest bug-free version, this is the one you want.

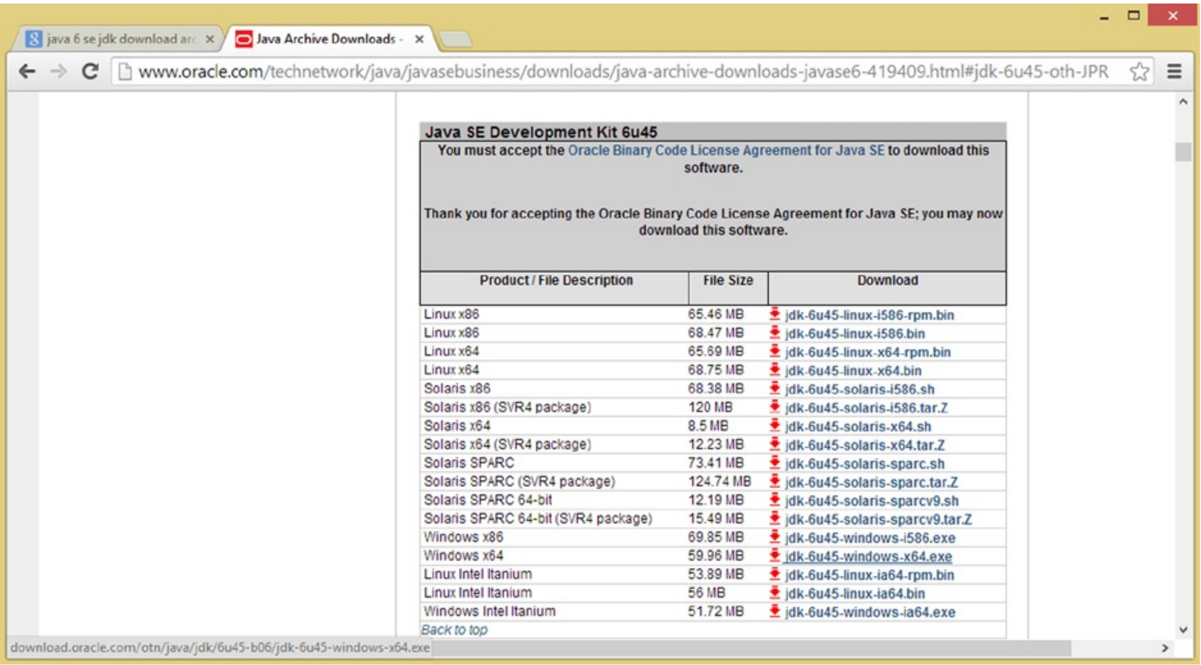
Make sure that you use this **Java SE Development Kit 6u45** download link, and do not use a JRE download link. The JRE is part of the JDK6u45, so you do not have to worry about getting the Java Runtime separately. In case you're wondering, you will indeed use the JRE to launch and run your Eclipse IDE, and you will use the JDK inside of Eclipse to provide the Java core class foundation for the Android OS Java-based API.

Note The JRE is the executable (platform) that runs your Java software once it has been compiled into an application, and thus a JRE will be needed to run Eclipse, because Eclipse is 100% written using Java SE.

Make sure **not** to download a JDK 7u45 or the JDK 7u45 Bundle, which includes NetBeans 7.4 from the normal (non-archived) download page, because Android 4.4 uses JavaSE 6u45 and the Eclipse 4.4 IDE, **not** the NetBeans 7.4 IDE for its ADT plug-ins, so **be very careful** regarding this foundational install step.

I actually use a completely different workstation for Android development, which has Java SE 6u45 and Eclipse 4.4, and have another HTML5 development workstation that has Java SE 8u5 and NetBeans 8.0 (only) installed on it. These will be covered in my upcoming Beginner Java 8 Games Development title from Apress.

2. Once you click on the Java SE Development Kit 6u45 link, you will be taken to the Java SE Development Kit 6u45 Download section of this page, shown in Figure 1-2, where you will be able to select the OS you are using.



java 6 se jdk download arc
Java Archive Downloads -
www.oracle.com/technetwork/java/javasebusiness/downloads/java-archive-downloads-javase6-419409.html#jdk-6u45-oth-JPR

Java SE Development Kit 6u45

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

Thank you for accepting the Oracle Binary Code License Agreement for Java SE; you may now download this software.

Product / File Description	File Size	Download
Linux x86	65.46 MB	jdk-6u45-linux-i586-rpm.bin
Linux x86	68.47 MB	jdk-6u45-linux-i586.bin
Linux x64	65.69 MB	jdk-6u45-linux-x64-rpm.bin
Linux x64	68.75 MB	jdk-6u45-linux-x64.bin
Solaris x86	68.38 MB	jdk-6u45-solaris-i586.sh
Solaris x86 (SVR4 package)	120 MB	jdk-6u45-solaris-i586.tar.Z
Solaris x64	8.5 MB	jdk-6u45-solaris-x64.sh
Solaris x64 (SVR4 package)	12.23 MB	jdk-6u45-solaris-x64.tar.Z
Solaris SPARC	73.41 MB	jdk-6u45-solaris-sparc.sh
Solaris SPARC (SVR4 package)	124.74 MB	jdk-6u45-solaris-sparc.tar.Z
Solaris SPARC 64-bit	12.19 MB	jdk-6u45-solaris-sparcv9.sh
Solaris SPARC 64-bit (SVR4 package)	15.49 MB	jdk-6u45-solaris-sparcv9.tar.Z
Windows x86	69.85 MB	jdk-6u45-windows-i586.exe
Windows x64	59.96 MB	jdk-6u45-windows-x64.exe
Linux Intel Itanium	53.89 MB	jdk-6u45-linux-ia64-rpm.bin
Linux Intel Itanium	56 MB	jdk-6u45-linux-ia64.bin
Windows Intel Itanium	51.72 MB	jdk-6u45-windows-ia64.exe

Back to top

download.oracle.com/otn/java/jdk/6u45-b06/jdk-6u45-windows-x64.exe

***Figure 1-2.** Java SE u45 download links after Accept License Agreement Radio Button on the left enables them*

3. I am using what is described in these links as "**Windows x64**," which is the 64-bit version of Windows, for my Windows 7 and Windows 8.1 workstations. Once you click on an **Accept License Agreement** radio button on the **top-left** of this download links table, the links will become **bolded** and you will be able to click on the link for the OS version that you need to use.

If you're on Windows and your OS is 64-bit, you would use the **Windows x64** link; otherwise, you would use the **Windows x86** link. To find out what level of bit-depth your Windows OS is running at, open the **Start** menu, right-click on the **Computer** option, and select the **Properties** menu option. This will tell you all about your computer's hardware, including if it is using a 32-bit or 64-bit CPU and OS. Optimally, your workstation should match the bit-depth of the CPU with the bit-depth of the OS.

4. Once the installation executable has downloaded, open it, and install the latest Java SE 6u45 JDK on your system by **double-clicking** on the **EXE** file.

Remember that the reason that we did not download the JRE is because it is part of this JDK installation.

Once Java 6u45 (or later) JDK is installed on your workstation, you can then download and install the **Android ADT Bundle** from the **developer.android.com** web site. You can also use that same Add or Remove Programs utility in your Control Panel that you just used to remove older Java versions to confirm the success of the new Java installation, and to remove any older versions of any Android development environments that might be currently installed on this Android development workstation that we're going to be assembling from scratch during the remainder of this chapter. Let's get back to work!

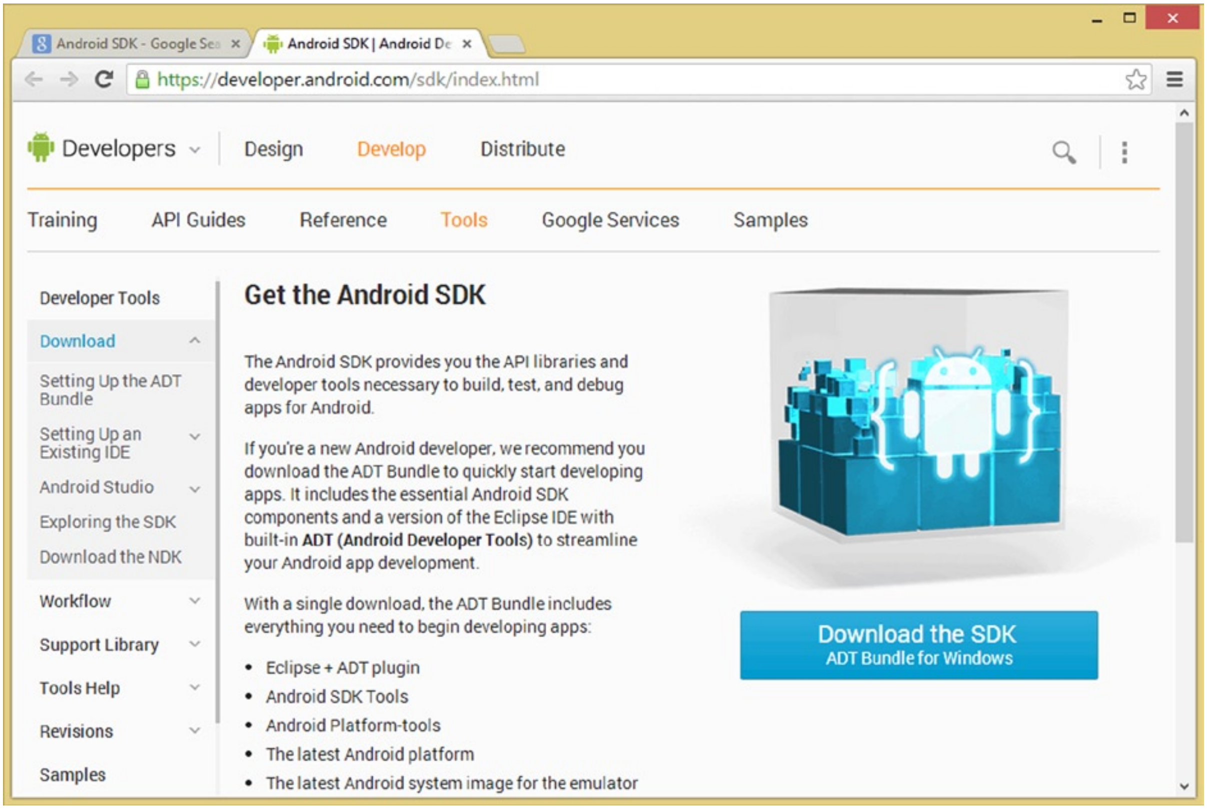
Android ADT Bundle: Find and Download Android's IDE

Now we need to visit the **developer.android.com** web site, and download and install the Android development environment ADT Bundle ZIP file from the /sdk/ folder of the site, at the following URL:

https://developer.android.com/sdk/index.html

1. Click on the **Get the SDK** button found on the bottom left of the Android developer web site's home page.

2. This will take you to the SDK section of the web site, which says "**Get the Android SDK**" at the top as shown in Figure 1-3, along with my Google search term: Android SDK (see top left browser tab), which is another way to find the Android developer SDK page!



Get the Android SDK

The Android SDK provides you the API libraries and developer tools necessary to build, test, and debug apps for Android.

If you're a new Android developer, we recommend you download the ADT Bundle to quickly start developing apps. It includes the essential Android SDK components and a version of the Eclipse IDE with built-in **ADT (Android Developer Tools)** to streamline your Android app development.

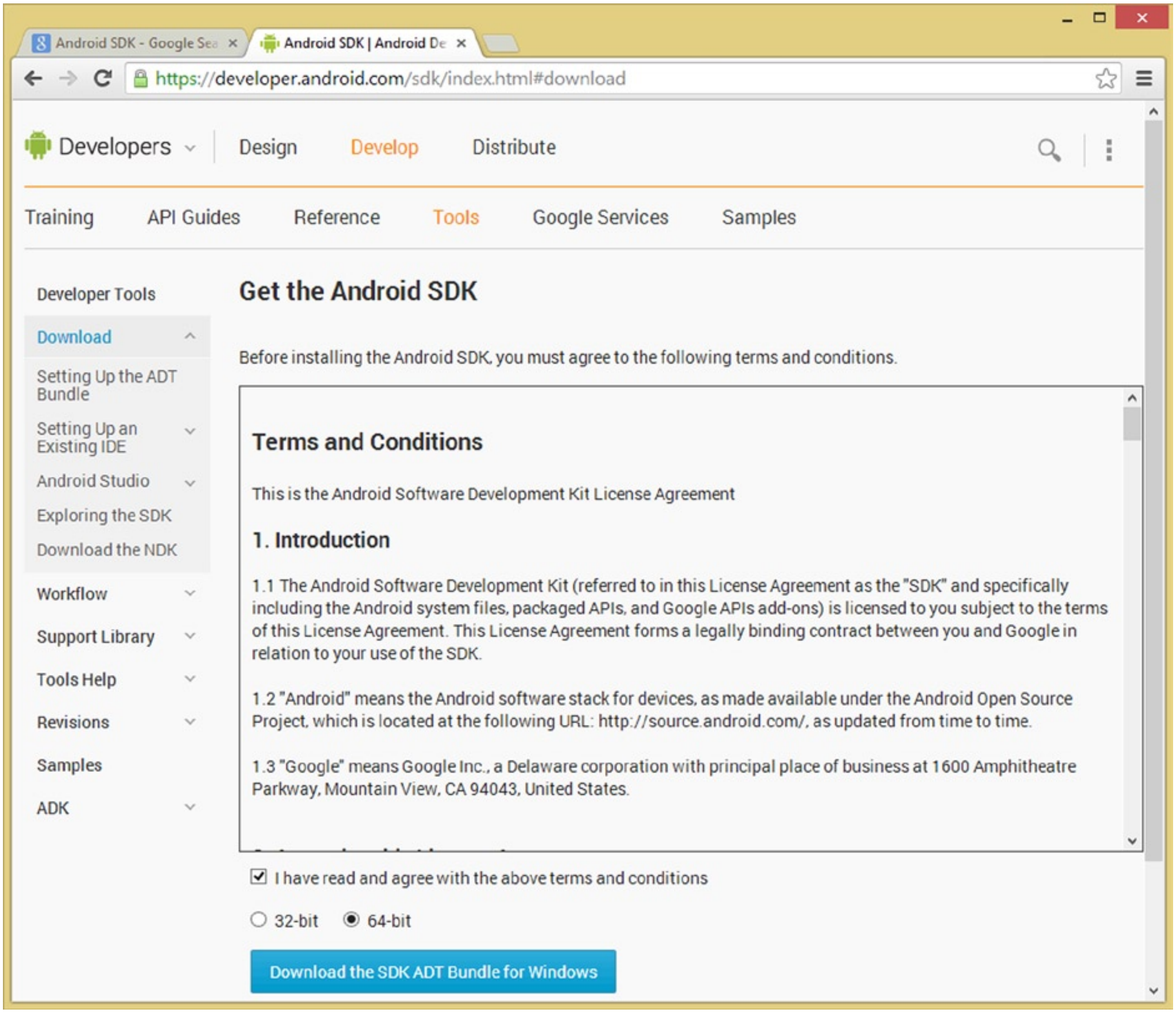
With a single download, the ADT Bundle includes everything you need to begin developing apps:

- Eclipse + ADT plugin
- Android SDK Tools
- Android Platform-tools
- The latest Android platform
- The latest Android system image for the emulator

Figure 1-3. *The `https://developer.android.com/sdk` web site page and the Download the SDK - ADT Bundle button*

5. Once you are on the **Get the Android SDK** page, click on the big blue **Download the SDK** button on the middle-right to download an **ADT Bundle for Windows**, as shown in Figure 1-3. This will take you to the actual download page.

The actual SDK ADT Bundle download page, shown in Figure 1-4, contains a section at the top for the **end user licensing agreement (EULA)** specific to the **Android Software Development Kit**, as well as selections for either the **32-bit** or the **64-bit** IDE Android software bundle download.



Get the Android SDK

Before installing the Android SDK, you must agree to the following terms and conditions.

Terms and Conditions

This is the Android Software Development Kit License Agreement

1. Introduction

1.1 The Android Software Development Kit (referred to in this License Agreement as the "SDK" and specifically including the Android system files, packaged APIs, and Google APIs add-ons) is licensed to you subject to the terms of this License Agreement. This License Agreement forms a legally binding contract between you and Google in relation to your use of the SDK.

1.2 "Android" means the Android software stack for devices, as made available under the Android Open Source Project, which is located at the following URL: http://source.android.com/, as updated from time to time.

1.3 "Google" means Google Inc., a Delaware corporation with principal place of business at 1600 Amphitheatre Parkway, Mountain View, CA 94043, United States.

☑ I have read and agree with the above terms and conditions

○ 32-bit ● 64-bit

Download the SDK ADT Bundle for Windows

Figure 1-4. Android Developer site Download the SDK page where you click on the Download the SDK ADT Bundle button

6. Review the "**Terms and Conditions**" section of this web page carefully, along with your legal department, if necessary, and then click the check box next to the statement at the bottom that reads: **I have read and agree with the above terms and conditions**, as you can see in Figure 1-4. Once you have done this, the rest of your download options will become active (not ghosted) and you will be ready to specify which version of the Android ADT Bundle for Windows that you need.

I recommend using the 64-bit IDE on 64-bit Windows OSs and the 32-bit IDE on 32-bit Windows OSs. Hopefully, you will have a 64-bit OS that can access 4GB memory or even more (8GB or 16GB of memory). If you forgot how to find out at which bit-depth your OS is running, right-click on

My Computer" on the OS **Start menu**, and select the **Properties** menu option. This will reveal a multi-tab dialog containing all of your OS specifications.

7. Once this check box has been activated (checked), you should now be able to select either the 32-bit or the 64-bit version of this ADT Bundle, which is essentially an Eclipse ADT 4.4 **ZIP format** software installation package that contains an Eclipse IDE with the Android ADT plug-ins pre-configured.

If you downloaded the Java 6u45 JDK for Windows x64 or Linux x64, you would select the 64-bit version; conversely, if you selected Java 6u45 for an x86 OS, you would select the 32-bit version of this SDK ADT bundle of software.

8. Once this selection has been made, the actual **Download the SDK ADT Bundle** blue button will be activated and you may click on it to begin a download.

Once this download is complete, we'll **unZIP** the files in a development directory that will set up the Android OS and development environment (IDE) for use on your Android development workstation, which you will be creating during this chapter and then configuring for use during the next chapter.

PAST INSTALLATION

Before this Android ADT "Bundle" became available in Version 4, setting up this Android IDE was a complicated and involved process, taking some 50 or more steps, including installing Java SDK, then Android SDKs, then Android Plug-Ins, then configuring the Plug-Ins to "see" the Android SDK.

If you are familiar with the first or second edition of this *Android Apps for Absolute Beginners* title, you are already familiar with what used to be required to get a working Android development environment installed on your development workstation.

This new bundling approach accomplishes all of the Android SDK and plug-in configurations by including the Eclipse IDE, along with all of the Android SDK and plug-in components, in one single pre-configured "bundle."

This allows all the configuration work to be done in advance by the people at Google who work on the Android team, instead of by developers at home.

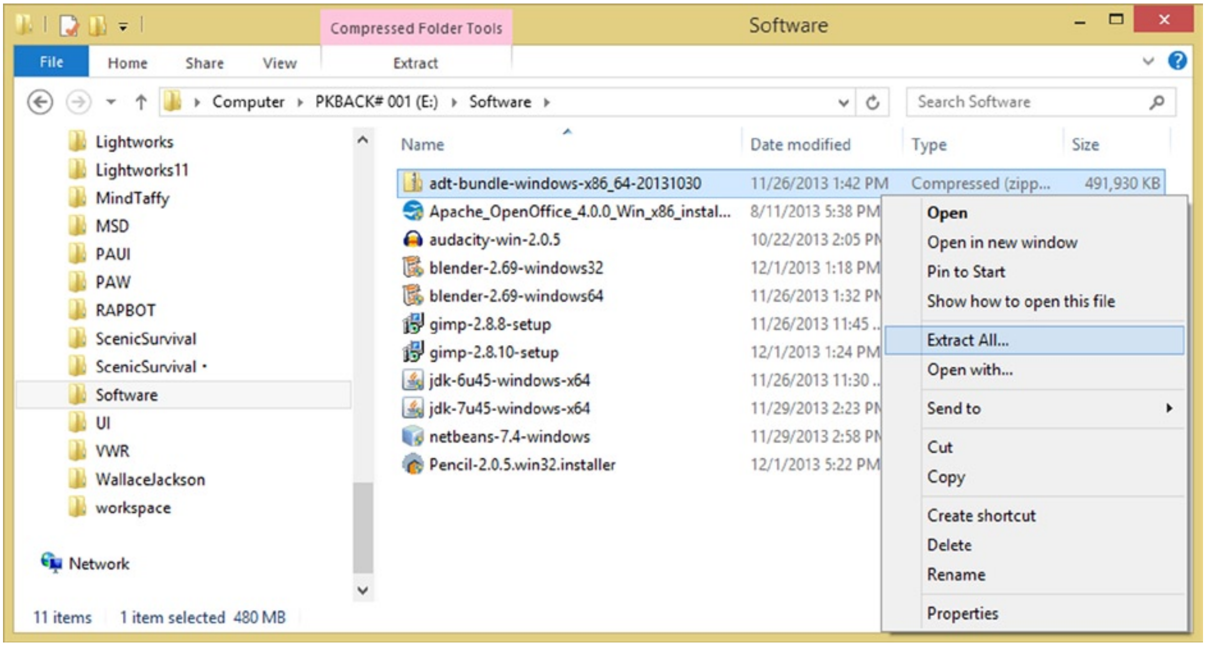
Install the Android ADT Bundle: Extract Android ADT IDE

1. The first thing that you will need to do once your download is complete is to find the file that you just downloaded. It should be in your OS **Downloads** folder, or in my case, I specified my **Software** folder for the download, since I use a USB key to hold my open source software files.

If you don't know where your browser put your file when you downloaded it, you can also right-click on your downloaded file, located in the browser's **download progress** window, and select the **View in Folder** option. A download progress tab is generally located at the bottom "status bar" area for your browser, or accessible via a **download menu option**, or an icon in the upper right of the browser (usually three black bars/stripes indicating a menu).

Once you locate either the **adt-bundle-windows-x86.zip**, which you would use for 32-bit Windows XP, 32-bit Vista, 32-bit Windows 7, or 32-bit Windows 8, or the **adt-bundle-windows-x86_64.zip,** which you would use for your 64-bit Windows Vista, 64-bit Windows 7, or 64-bit Windows 8, you will then **extract** the contents of this ZIP file format into a folder on your hard drive.

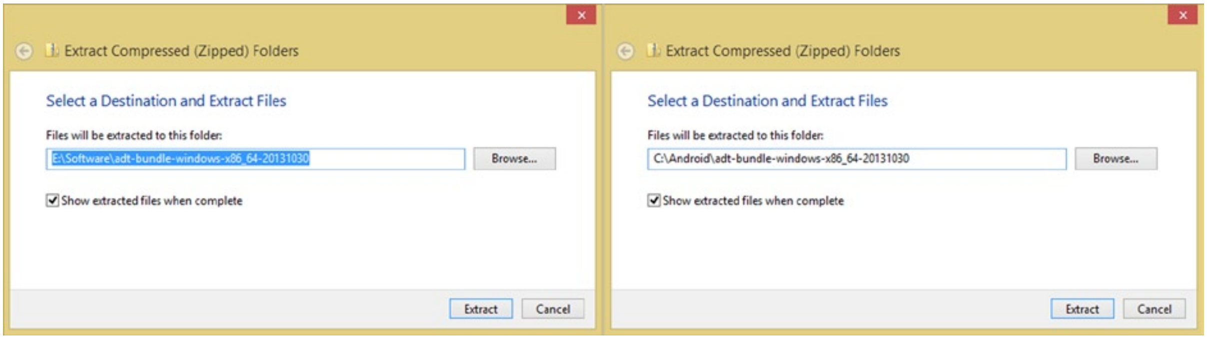
9. **The ZIP** file should be located in your Downloads folder, unless you have specified a different folder during the download process. Once you find the ZIP file, **right-click** on it, and select the **Extract All…** option from the context-sensitive menu, as is shown in Figure 1-5.



Name	Date modified	Type	Size
adt-bundle-windows-x86_64-20131030	11/26/2013 1:42 PM	Compressed (zipp...	491,930 KB
Apache_OpenOffice_4.0.0_Win_x86_instal...	8/11/2013 5:38 PM		
audacity-win-2.0.5	10/22/2013 2:05 PI		
blender-2.69-windows32	12/1/2013 1:18 PM		
blender-2.69-windows64	11/26/2013 1:32 PI		
gimp-2.8.8-setup	11/26/2013 11:45 ..		
gimp-2.8.10-setup	12/1/2013 1:24 PM		
jdk-6u45-windows-x64	11/26/2013 11:30 ..		
jdk-7u45-windows-x64	11/29/2013 2:23 PI		
netbeans-7.4-windows	11/29/2013 2:58 PI		
Pencil-2.0.5.win32.installer	12/1/2013 5:22 PM		

***Figure 1-5.** Right-click on adt-bundle-windows-x86_64-20131030.zip file and select the Extract All… menu option*

10. In the **Select a Destination and Extract Files** dialog shown in Figure 1-6, place your cursor before the adt-bundle-windows part of the file name and then backspace over the Downloads folder, or in my case a Software folder. We're doing this because we don't want to locate a development environment in our software downloads folder, but rather under the **root** of our primary hard disk drive that is usually designated as **C:\** and thus, the resulting install path is **C:\adt-bundle-windows-x86** or **C:\adt-bundle-windows-x86_64**, shown in Figure 1-7. Once your install folder is specified, click **Extract**.



Extract Compressed (Zipped) Folders

Select a Destination and Extract Files

Files will be extracted to this folder:

E:\Software\adt-bundle-windows-x86_64-20131030

☑ Show extracted files when complete

Extract Compressed (Zipped) Folders

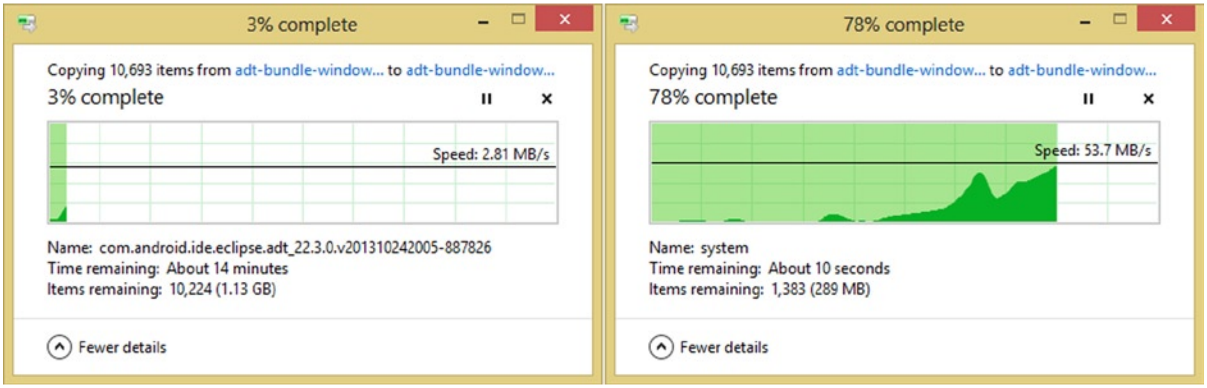
Select a Destination and Extract Files

Files will be extracted to this folder:

C:\Android\adt-bundle-windows-x86_64-20131030

☑ Show extracted files when complete

***Figure 1-6.** Edit the Target Installation Extraction Folder to place the subfolder into the C:\Android\ HDD folder*



3% complete

Copying 10,693 items from adt-bundle-window... to adt-bundle-window...

3% complete

Speed: 2.81 MB/s

Name: com.android.ide.eclipse.adt_22.3.0.v201310242005-887826
Time remaining: About 14 minutes
Items remaining: 10,224 (1.13 GB)

78% complete

Copying 10,693 items from adt-bundle-window... to adt-bundle-window...

78% complete

Speed: 53.7 MB/s

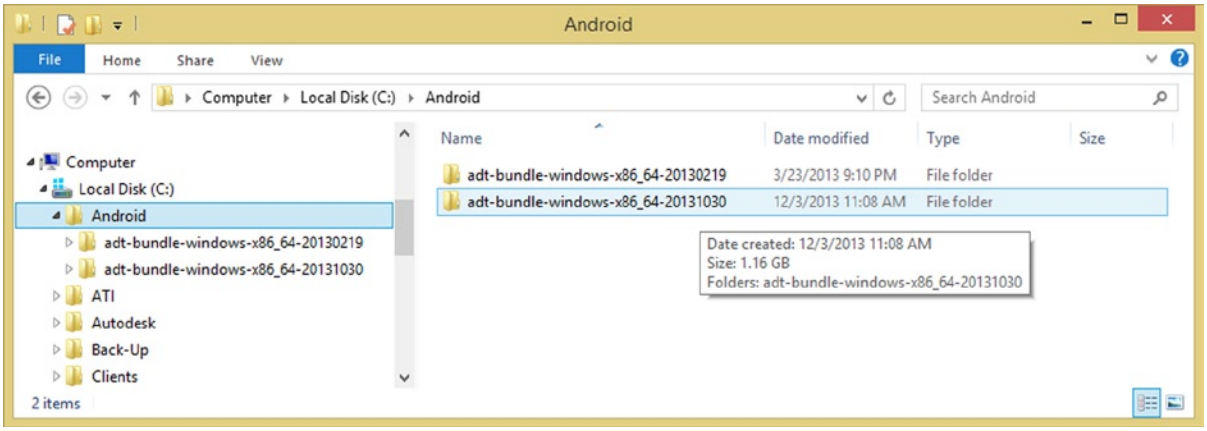
Name: system
Time remaining: About 10 seconds
Items remaining: 1,383 (289 MB)

***Figure 1-7.** Detailed progress bar showing installation in Windows 8.1 using More Details option at 3% and 78%*

Once you click the Extract button, you will get a **progress dialog**, as seen in Figure 1-7, showing the archived files being extracted into 1GB of data, spanning some 10,693 items, into dozens of folders and sub-folders.

Once everything is extracted, which may take a little while depending upon the data access (and write) speed of your hard disk drive and the computer processor speed, we'll be ready to create a **shortcut** for Eclipse.

11. Once this extraction process is complete, open your OS file management utility; for Windows 8.1, this is called **Windows Explorer**, and is shown in use in Figure 1-8, with the Android 4.4 ADT Bundle showing as extracted next to the older Android 4.2.2 installation I used for my *Pro Android Graphic* and *Pro Android UI* book titles that I wrote back in 2013.



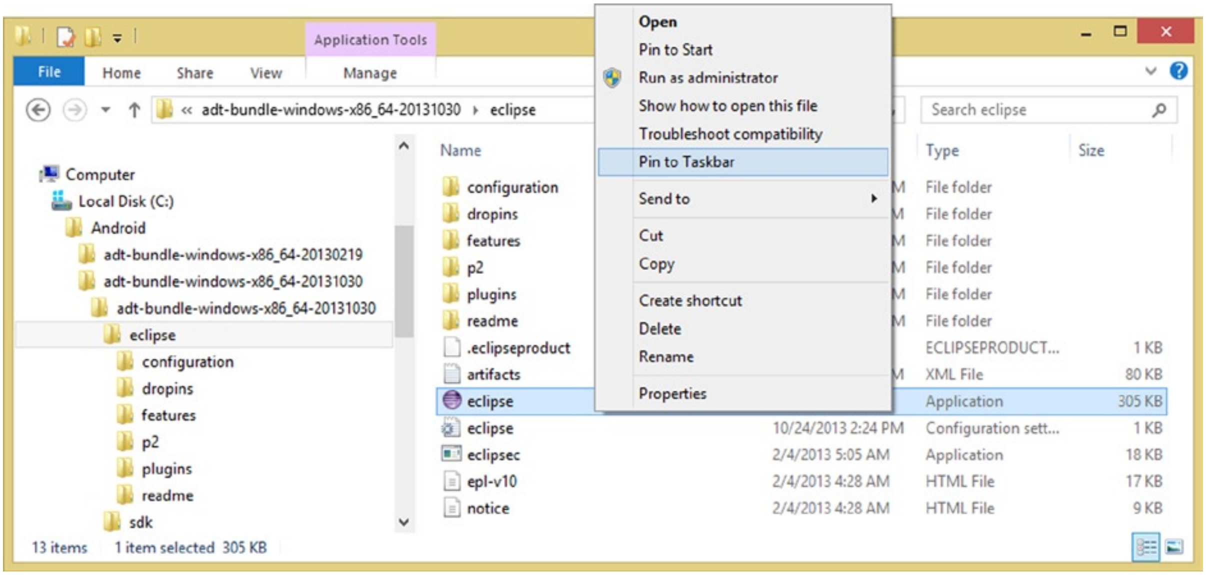
Name	Date modified	Type	Size
adt-bundle-windows-x86_64-20130219	3/23/2013 9:10 PM	File folder	
adt-bundle-windows-x86_64-20131030	12/3/2013 11:08 AM	File folder	

Date created: 12/3/2013 11:08 AM
Size: 1.16 GB
Folders: adt-bundle-windows-x86_64-20131030

***Figure 1-8.** An adt-bundle-windows-x86_64-20131030 folder (Android 4.4) next to the Android 4.2 folder*

It is important to note, as seen in Figure 1-8, that you can install more than one Eclipse ADT. Shown are Android 4.2.2 and Android 4.4 versions, so if I need to, I can launch a previous version of Eclipse ADT by using that **eclipse.exe** application to launch that (subdirectory) OS configuration.

12. Next, you need to locate your latest **adt-bundle-windows-x86_64** folder, as shown in Figure 1-9, on your **C:\Android\** hard disk drive path in the left side of the File Explorer, inside of your hard disk drive navigation pane.



Name	Date modified	Type	Size
configuration	M	File folder	
dropins	M	File folder	
features	M	File folder	
p2	M	File folder	
plugins	M	File folder	
readme	M	File folder	
.eclipseproduct		ECLIPSEPRODUCT...	1 KB
artifacts	M	XML File	80 KB
eclipse		Application	305 KB
eclipse	10/24/2013 2:24 PM	Configuration sett...	1 KB
eclipsec	2/4/2013 5:05 AM	Application	18 KB
epl-v10	2/4/2013 4:28 AM	HTML File	17 KB
notice	2/4/2013 4:28 AM	HTML File	9 KB

***Figure 1-9.** Open the latest adt-bundle folder and the eclipse subfolder and find the eclipse Application and Icon*

13. Find your **eclipse** folder (it will be located under your **adt-bundle-windows** folder) and then click on it. This will show the **contents** (files and sub-folders) for this particular folder, in your **file management pane**, on the right-hand side of the File Explorer.

14. Find the **eclipse.exe** program **executable** file; it will have a **purple sphere** icon, as shown in Figure 1-9. Right-click on this eclipse executable file, and select the **Pin to Taskbar** option from the context-sensitive menu, which is always accessible via a right-click.

Once you select the **Pin to Taskbar** option, a **single-click** Eclipse software launch icon will be installed on the OS Taskbar, so that you can quickly and easily launch the Eclipse ADT software anytime you want to develop Android applications. Figure 1-10 shows your Eclipse quick launch application icon, along with some of the other applications that you will be installing later on in the chapter, and some useful OS system utilities that developers should have easy access to via these quick launch icons.

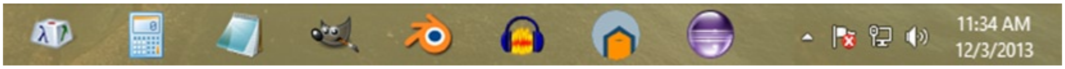


***Figure 1-10.** Taskbar with Quick Launch Icons for Eclipse, Pencil, Audacity, Blender, GIMP, Notepad, Calculator and Character Map*

It is important to note that we did not need to install shortcuts for Java 6u45, as the JDK that we installed exists underneath the other application development tools. Java is a development environment infrastructure and is not directly accessed or run like Eclipse ADT or the other new media software development tools that we'll be installing next.

We'll be creating launch icon shortcuts for these tools as well on our OS Taskbar so that we can quickly and easily launch them at a moment's notice!

Let's install your digital image compositing and editing software package next. The current version of **the GIMP** (Graphic Image Manipulation Program) is 2.8.10 and it provides most of the primary features of Adobe Photoshop. GIMP 3.0 is expected out any day now, so if you are lucky, you will be installing the powerful new GIMP 3.0 for your content development workstation!

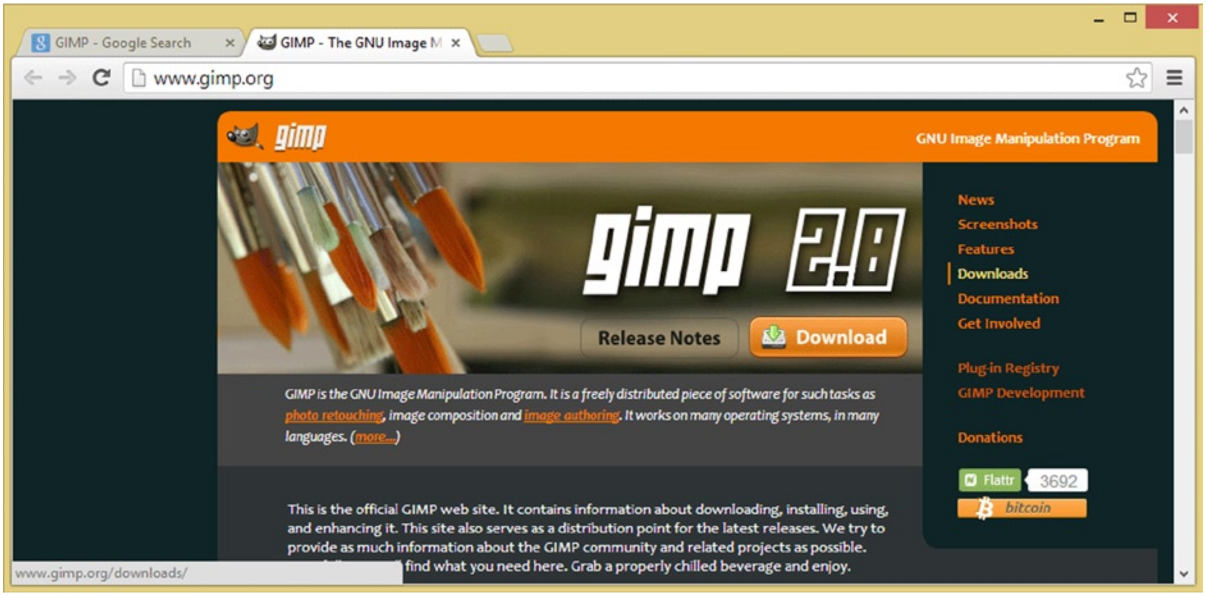
Digital Image Compositing Software: the GIMP

We will be using GIMP in the book to manipulate digital image assets that will be used for application icons and user interface elements as well as frame based animation. GIMP is a truly amazing piece of software.

As you can see in Figure 1-11, you can either enter "GIMP" into the Google search bar as is shown in the left browser tab, or you can type in the following URL for the web site:

`http://www.gimp.org/`

When the GIMP home page appears, you will see an orange **Download** button and a yellow **Downloads** link on the top-right of the page. You will click on either one of these to access the GIMP 2.8.10 /downloads/ page.



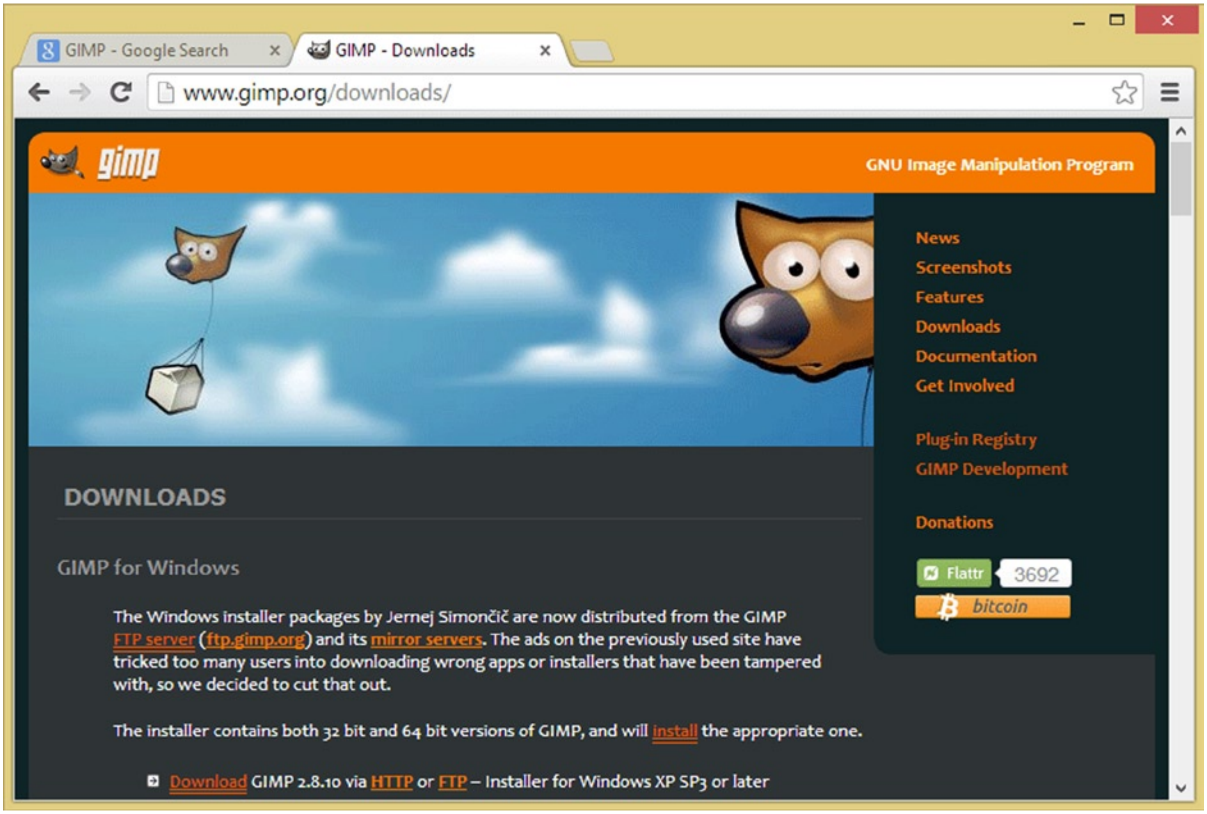
GIMP is the GNU Image Manipulation Program. It is a freely distributed piece of software for such tasks as photo retouching, image composition and image authoring. It works on many operating systems, in many languages. (more...)

This is the official GIMP web site. It contains information about downloading, installing, using, and enhancing it. This site also serves as a distribution point for the latest releases. We try to provide as much information about the GIMP community and related projects as possible. find what you need here. Grab a properly chilled beverage and enjoy.

***Figure 1-11.** Go to the gimp.org web site and click on the orange Download button or on the Downloads link*

Note Until recently, GIMP was hosted on SourceForge, but the company made the decision to self-host on their HTTP servers, due to some activity regarding advertiser opt-ins that the creators of the GIMP didn't support.

As you can see in Figure 1-12, you can download GIMP via the GIMP 2.8.10 HTTP server, using this downloads page.



DOWNLOADS

GIMP for Windows

The Windows installer packages by Jernej Simončič are now distributed from the GIMP FTP server (ftp.gimp.org) and its mirror servers. The ads on the previously used site have tricked too many users into downloading wrong apps or installers that have been tampered with, so we decided to cut that out.

The installer contains both 32 bit and 64 bit versions of GIMP, and will install the appropriate one.

- Download GIMP 2.8.10 via HTTP or FTP – Installer for Windows XP SP3 or later

Figure 1-12. Click an HTTP link to download GIMP 2.8.10 from an HTTP server or FTP to download from an FTP

15. Once the download is complete, launch the installer EXE, which is actually visible in Figure 1-5, and should be named **gimp-2.8.10-setup.exe**, unless a later version has become available (version 3.0 is expected out in 2014).

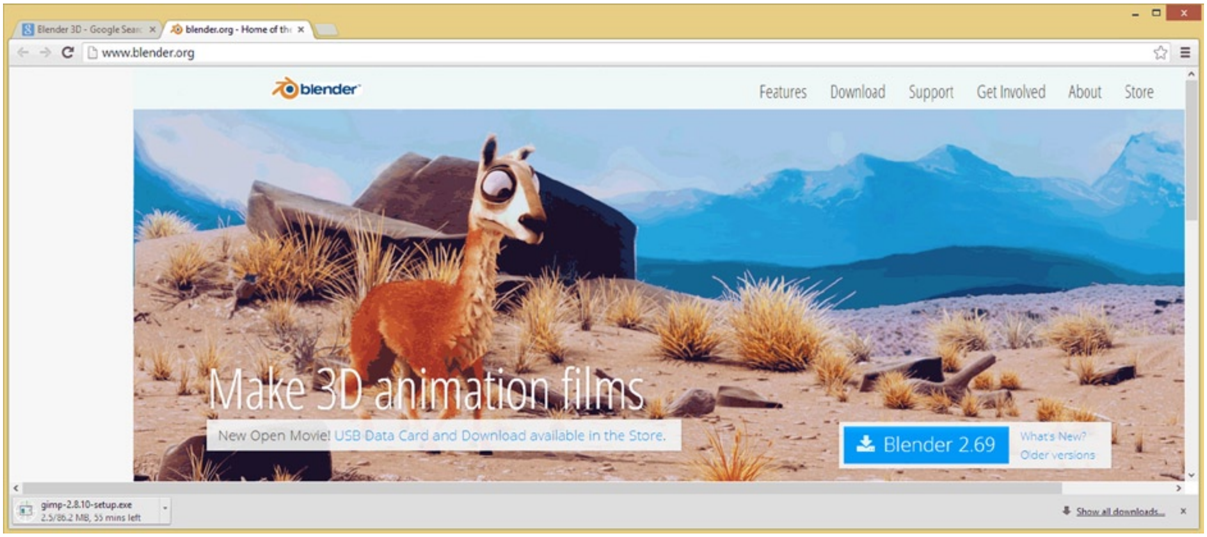
3D Modeling, Rendering, and Animation: Blender 3D

3D modeling, rendering, and animation software is a valuable tool for a number of things that are included in Android, from application icons to digital imagery to frame-based animation to OpenGL real-time 3D rendering.

Next, let’s go get one of the most popular open source software packages in the world, the Blender 3D modeling, 3D rendering, and 3D animation software package, which can be found on the Blender web site, at the following URL:

http://www.blender.org/

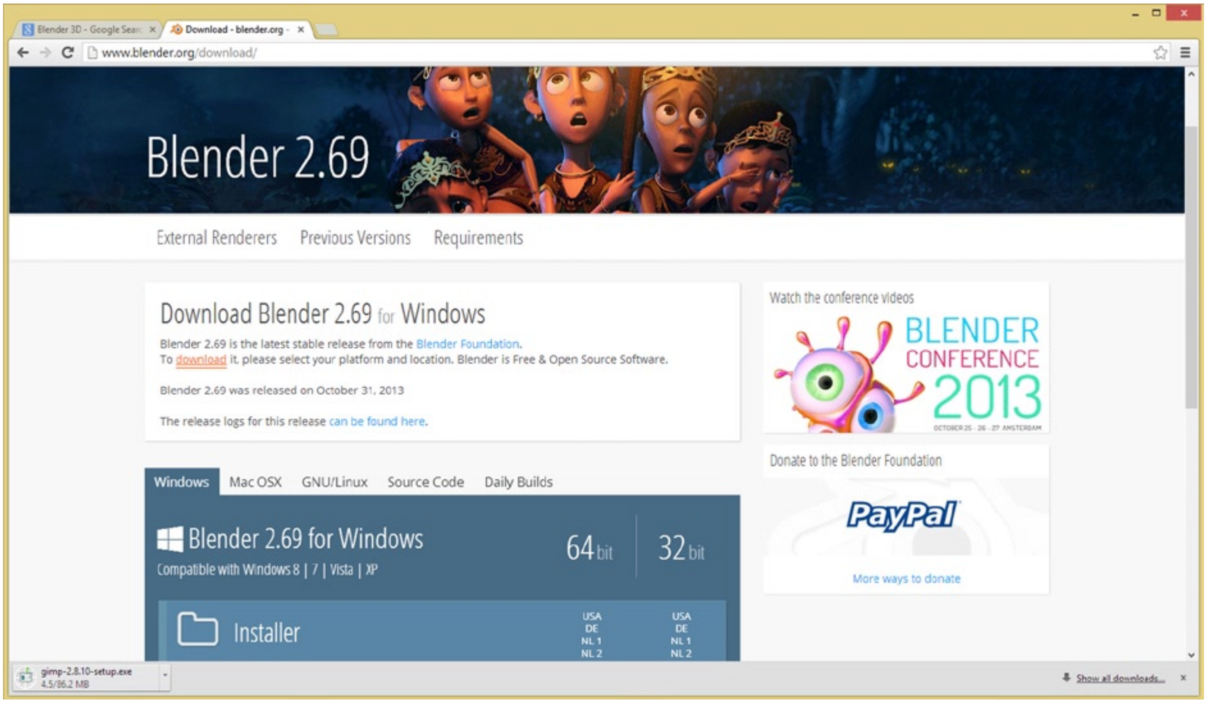
As you can see in Figure 1-13, there is also a blue **Download Blender 2.69** button on the Blender.org home page, which will also take you to a Blender download page, where you can select a 32-bit or 64-bit version of Blender for Windows. Blender is also available for Linux, Mac, Unix, and Solaris.



New Open Movie! USB Data Card and Download available in the Store.

Figure 1-13. The Blender.org home page, where you can click on the blue Download Blender 2.69 button

This site will **auto-detect** the OS version that you are currently running, and since I am running Windows 8, you will see in Figure 1-14 that Blender for Windows is shown in the dark blue primary software download area.



Download Blender 2.69 for Windows

Blender 2.69 is the latest stable release from the Blender Foundation.
To download it, please select your platform and location. Blender is Free & Open Source Software.

Blender 2.69 was released on October 31, 2013

The release logs for this release can be found here.

Figure 1-14. The Blender.org/download/ page and auto-detect of the Windows OS, and 64-bit and 32-bit options