

Android Version 5 Security Essentials

Android Security Essentials



- Understand Android's security model and architecture.
- Build Android applications with security best practices in mind.
- Build more robust applications that appeal to clients.
- Build a new Android application for each Android security lesson.

By Android ATC Team

www.androidatc.com

Android ATC

Android™ Security Essentials

Course Code: AND-402 version 5

Hands on Guide to Android Security Principles

Android™ Security Essentials

Course Code: AND-402 version 5

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Android Security Essentials is a detailed guide on the basics of Android security best practices. The book is accompanied with practical hands on examples, illustrations, and practical labs. It will help you build your Android application with security in mind.

Lessons in this book cover a wide range of security related topics. It starts off with a through guide on Android permissions then moves to the manipulation of application policy. It also explains the principles of user privacy followed a guide on all secure data storage techniques available in Android system.

Warning and Disclaimer

This book is designed to provide information about “Android Security Essentials” course with exam AND-402. Every effort has been made to make this book as complete and as accurate as possible, but no warranty or fitness is implied.

Exam

You can examine your knowledge on the content of this book by taking the online exam AND-402 through PearsonVUE testing centers worldwide. Passing this exam is one step in the path to become an “Android Certified Application Engineer”. For more information, visit:

<http://www.pearsonvue.com/androidatc/>

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Course Prerequisite

The prerequisite for this course, the trainees must have good knowledge in Android application development in the first place, if not, it is recommended to start with the "Android Application Development" course, which available in the Android ATC web site, self-study tab.

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ANDROID STUDIO AND SDK INSTALLATION GUIDE

INTRODUCTION

This document provides a guide on how to install all software needed to setup your machine for Android applications development.

SOFTWARE NEEDED

1. **Java SDK.** This includes the Java virtual machine and development tools, which allows you to compile and run your Java code.
2. **Android SDK platform.** This is the set of programming libraries and APIs that provides the necessary methods and interfaces to develop Android applications and allows you to compile your code. Each Android version is a platform that can be installed using SDK manager (check the lab). If you want to develop an Android application for a specific version of Android, you must install the SDK platform for that version.
3. **Android Studio.** This is the official Android IDE.
4. **Android SDK Tools.** A software component that includes a complete set of development and debugging tools for Android SDK.
5. **Android SDK build tools.** This is the software component required to build Android application code after a developer finishes building the application. The build tools are continuously running during development to facilitate the testing process for a developer.

The last four software components are bundled into one installation file as described in section **‘Install Android Studio Bundle’**

Lab Setup

The following is a step-by-step guide on installing the software required for Android development. There are two main components you must install on your machine are **Java SDK** and the **Android Studio Bundle**.

JAVA SDK

Install the latest Java SDK compatible with your operating system by following these steps:

1. Visit the following link to download the latest version of Java SDK (JDK).

<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

Note that you need at least JDK version 7.0.

2. Click on '**DOWNLOAD**' under JDK.



3. Click on 'Accept License Agreement' in the table titled 'Java SE Development Kit'.

Java SE Development Kit 8u40		
You must accept the Oracle Binary Code License Agreement for Java SE to download this software.		
<input checked="" type="radio"/> Accept License Agreement <input type="radio"/> Decline License Agreement		
Product / File Description	File Size	Download
Linux x86	146.85 MB	jdk-8u40-linux-i586.rpm
Linux x86	166.82 MB	jdk-8u40-linux-i586.tar.gz
Linux x64	145.14 MB	jdk-8u40-linux-x64.rpm
Linux x64	165.19 MB	jdk-8u40-linux-x64.tar.gz
Mac OS X x64	221.89 MB	jdk-8u40-macosx-x64.dmg
Solaris SPARC 64-bit (SVR4 package)	131.59 MB	jdk-8u40-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	92.83 MB	jdk-8u40-solaris-sparcv9.tar.gz
Solaris x64 (SVR4 package)	139.45 MB	jdk-8u40-solaris-x64.tar.Z
Solaris x64	95.82 MB	jdk-8u40-solaris-x64.tar.gz
Windows x86	175.71 MB	jdk-8u40-windows-i586.exe
Windows x64	180.19 MB	jdk-8u40-windows-x64.exe

4. Click on the link under **Download** to download the JDK version compatible with your operating system. For example, download the file for '**Windows x86**' if your operating system is a Windows 32-bit, or **Windows x64** if your operating system is Windows 64-bit.
5. Run the installation file when the download finishes then follow the installation wizard.

INSTALL ANDROID STUDIO BUNDLE

Now that Java SDK is installed, follows these steps to install Android Studio Bundle.

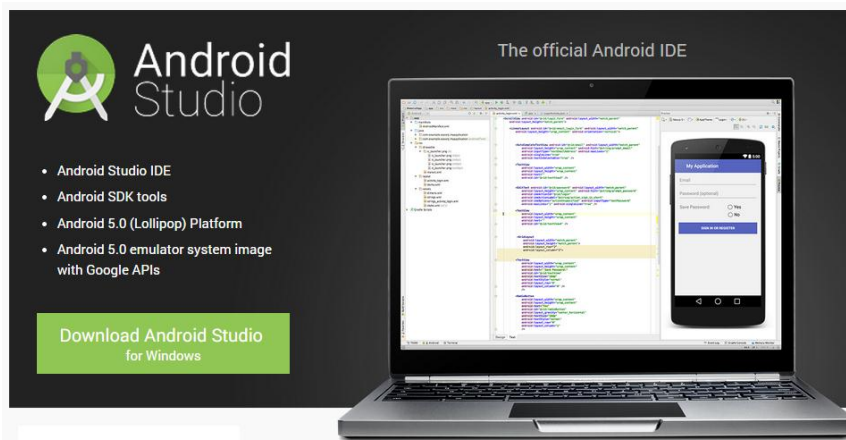
These are all the components you need to start Android development and they are all included in the Android Studio bundle.

- Android Studio IDE
- Android SDK tools
- The latest Android platform (Android 5.0 - Lollipop)
- Android 5.0 emulator system image so that you can test your applications using an emulator of Android 5.0 (Lollipop)

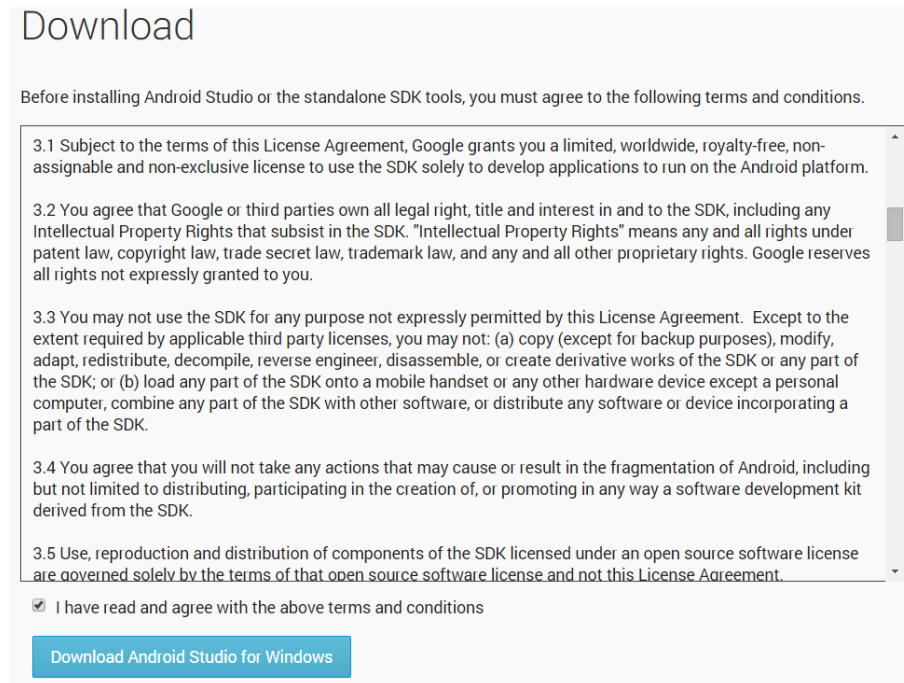
To install Android Studio bundle:

1. Open the following link to download Android Studio:

<http://developer.android.com/sdk/>



2. Click the “**Download Android Studio**” button.



The screenshot shows the 'Download' section of the Android Studio website. It features a scrollable text area containing the Android SDK License Agreement. The text includes clauses 3.1 through 3.5, which detail the terms of use for the SDK, including restrictions on redistribution and the requirement to agree to the license. Below the scrollable area, there is a checkbox labeled 'I have read and agree with the above terms and conditions', which is checked. At the bottom of the form is a blue button labeled 'Download Android Studio for Windows'.

Download

Before installing Android Studio or the standalone SDK tools, you must agree to the following terms and conditions.

3.1 Subject to the terms of this License Agreement, Google grants you a limited, worldwide, royalty-free, non-assignable and non-exclusive license to use the SDK solely to develop applications to run on the Android platform.

3.2 You agree that Google or third parties own all legal right, title and interest in and to the SDK, including any Intellectual Property Rights that subsist in the SDK. "Intellectual Property Rights" means any and all rights under patent law, copyright law, trade secret law, trademark law, and any and all other proprietary rights. Google reserves all rights not expressly granted to you.

3.3 You may not use the SDK for any purpose not expressly permitted by this License Agreement. Except to the extent required by applicable third party licenses, you may not: (a) copy (except for backup purposes), modify, adapt, redistribute, decompile, reverse engineer, disassemble, or create derivative works of the SDK or any part of the SDK; or (b) load any part of the SDK onto a mobile handset or any other hardware device except a personal computer, combine any part of the SDK with other software, or distribute any software or device incorporating a part of the SDK.

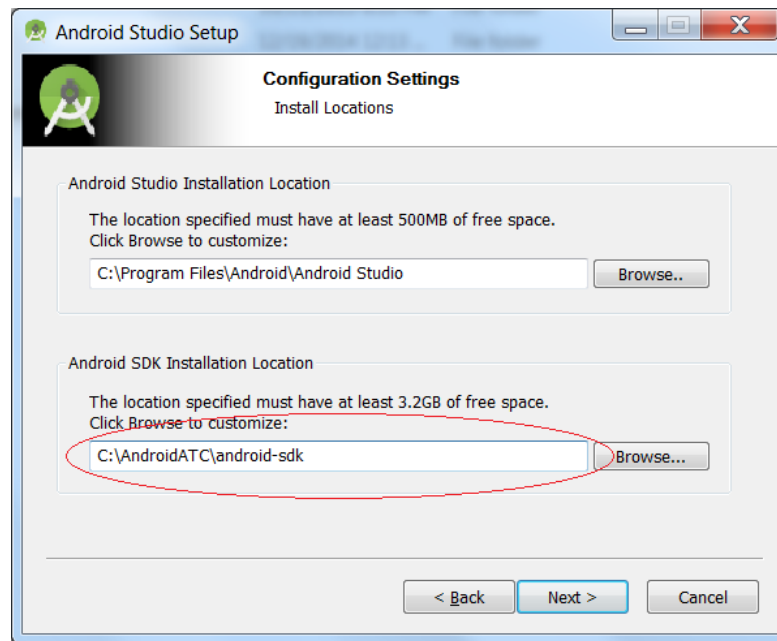
3.4 You agree that you will not take any actions that may cause or result in the fragmentation of Android, including but not limited to distributing, participating in the creation of, or promoting in any way a software development kit derived from the SDK.

3.5 Use, reproduction and distribution of components of the SDK licensed under an open source software license are governed solely by the terms of that open source software license and not this License Agreement.

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

Download Android Studio for Windows

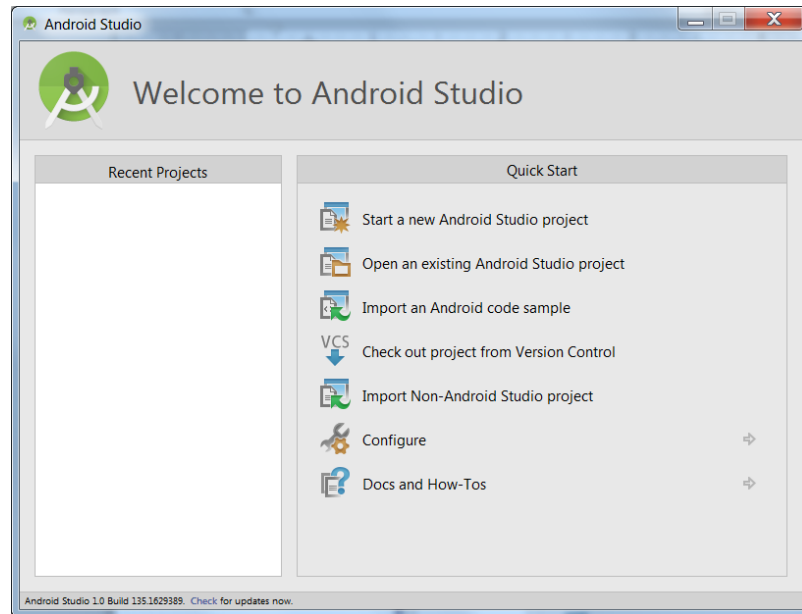
3. Accept the terms and conditions then click on “**Download Android Studio for Windows**” button. This will start the download of an executable file called android-studio-bundle-xxx.xxxxxxxx.exe, where xxx.xxxxxxxx refers the build number. The button label and file name would change if you are using a Mac machine because the download webpage will automatically detect your system.
4. Run the installer file to start the installation wizard.
5. Follow the installation wizard steps. Note that you should specify the location of the Android SDK folder if you already have the SDK installed on your machine. This is an important step to follow if you want to use the installed Android SDK tools, platforms, system images...etc. instead of using the single platform and system image that come with Android Studio installation bundle. If, however, you have not previously installed Android SDK, or you want to use the one that comes with Android Studio, keep the default location.



6. Open `<path_to_Android_Studio_installation>\bin` and run ***studio.exe*** if you have a 32 bit machine or ***studio64.exe*** if you have a 64 bit machine. You will see the following splash screen during startup.



7. Wait for few seconds for the startup of Android Studio then you will see the following screen:



Now Android Studio is installed on your machine and ready to be used for Android Development.



Note that the latest emulator included with the Android Studio bundle requires higher system specs for optimal performance. It is recommended that your machine has at least **4 GB RAM** to get a smooth training on the latest Android ATC courses.

Android Security Essentials

Exam (AND-402) Sample

Q1. What are the permissions that are granted automatically without user's approval?

- A. Signature Permissions
- B. System Permissions
- C. Dangerous Permissions
- D. Normal permission

Answer: D

Q2. Which of the following permissions is most dangerous and can cause severe damage to Device?

- A. BRICK
- B. REBOOT
- C. SHUTDOWN
- D. ACCESS_WIFI_STATE

Answer: A

Q3. What is the reason for using Permissions in application development?

- A. To protect data and code
- B. To create patent
- C. To make it work better
- D. Application cannot be created without permissions

Answer: A

Q4. Which of the following is correct about Android permission PROCESS_OUTGOING_CALLS? (Choose two)

- A. Allows an application to access call logs.
- B. Allows an application to monitor or abort outgoing calls.
- C. Allows an application to record outgoing calls.
- D. Allows an application to divert incoming calls.

Answer: B & C

Q5. Which XML tag is used to access protected features of the device?

- A. <uses sdk>
- B. <uses-permission>
- C. <application>
- D. <permission>

Answer: B

Q6. Android permissions can be extended by

- A. Using keyword “extends”.
- B. Creating custom permissions in manifest file.
- C. Permissions cannot be extended.
- D. None of the answers are correct.

Answer: B

Q7. Tag <grant-uri-permission> is contained in which parent tag?

- E. <activity>
- F. <service>
- G. <provider>
- H. <receiver>

Answer: C

Q8. Which of the following is NOT true about “hasCode” attribute of <application> tag?

- A. Its default value is true.
- B. When the value is false, the system does not try to load any application code when launching components.
- C. There is no such attribute “hasCode” because every application contains some code and settings false cannot be an option.
- D. It is only possible that an application would not have any code of its own, in case it is using nothing but built-in component classes.

Answer: C

Q9: Which of the following is NOT true about the “label” attribute of the <application> tag? (Choose two)

- A. It should be set as a reference to a string resource.
- B. It cannot be a raw string.
- C. It is a user readable label for the application as a whole.
- D. Its default value is same as that given to the “description” attribute.

Answer: B and D

This book can be ordered in a hard copy format. The total price of the book including shipping and handling is 60 USD (Always delivered globally within 4 business days using express shipping).

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