Android Studio for beginners, Part 1: Installation and setup

Examples in this series are from the most stable version of Android at the time of this writing, Android 3.2.1.

Get started with Android Studio

Android Studio is Google's officially supported IDE for developing Android apps. This IDE is based on IntelliJ IDEA, which offers a powerful code editor and developer tools. Android Studio 3.2.1 includes the following features:

- A flexible Gradle-based build system
- A fast and feature-rich emulator
- A unified environment where you can develop for all Android devices
- Instant Run to push changes to your running app without building a new APK
- Code templates and GitHub integration to help you build common app features and import sample code
- Extensive testing tools and frameworks
- Lint tools to help you catch performance, usability, version compatibility, and other problems
- C++ and NDK support
- Built-in support for Google Cloud Platform, making it easy to integrate Google Cloud Messaging and Google App Engine

- Plugin architecture for extending Android Studio via plugins

Download Android Studio

Google provides Android Studio for the Windows, Mac OS X, and Linux platforms. You can download Android Studio from the Android Studio homepage, where you'll also find the traditional SDKs with Android Studio's command-line tools. Before downloading Android Studio, make sure your platform meets the following requirements:

Windows requirements

- Microsoft Windows 7/8/10 (32-bit or 64-bit)
- 3 GB RAM minimum, 8 GB RAM recommended (plus 1 GB for the Android Emulator)
- 2 GB of available disk space minimum, 4 GB recommended (500 MB for IDE plus 1.5 GB for Android SDK and emulator system image)
- 1280 x 800 minimum screen resolution

Mac OS requirements

- Mac OS X 10.10 (Yosemite) or higher, up to 10.13 (High Sierra)
- 3 GB RAM minimum, 8 GB RAM recommended (plus 1 GB for the Android Emulator)
- 2 GB of available disk space minimum, 4 GB recommended (500 MB for IDE plus 1.5 GB for Android SDK and emulator system image)

- 1280 x 800 minimum screen resolution

Linux OS requirements

- GNOME or KDE desktop. Tested on Ubuntu 14.04 LTS, Trusty Tahr (64-bit distribution capable of running 32-bit applications)
- 64-bit distribution capable of running 32-bit applications
- GNU C Library (glibc) 2.19 or later
- 3 GB RAM minimum, 8 GB RAM recommended (plus 1 GB for the Android Emulator)
- 2 GB of available disk space minimum, 4 GB recommended (500 MB for IDE plus 1.5 GB for Android SDK and emulator system image)
- 1280 x 800 minimum screen resolution

Once you've ensured that your operating system is compatible with Android Studio 3.2.1 or higher, download the appropriate Android Studio distribution file. The Android Studio download page auto-detected that I'm running a 64-bit Windows operating system and selected `android-studio-ide-181.5056338-windows.exe` (927 MB) for me to download.

Android SDK command-line tools
`android-studio-ide-181.5056338-windows.exe` includes an installer and the Android SDK command-line tools. If you don't need or want to use Android Studio, you can download only the Android SDK command-line tools.

Installing Android Studio on 64-bit Windows 10

I launched `android-studio-ide-181.5056338-windows.exe` to start the installation process. The installer responded by

presenting the **Android Studio Setup** dialog box shown in Figure 1.

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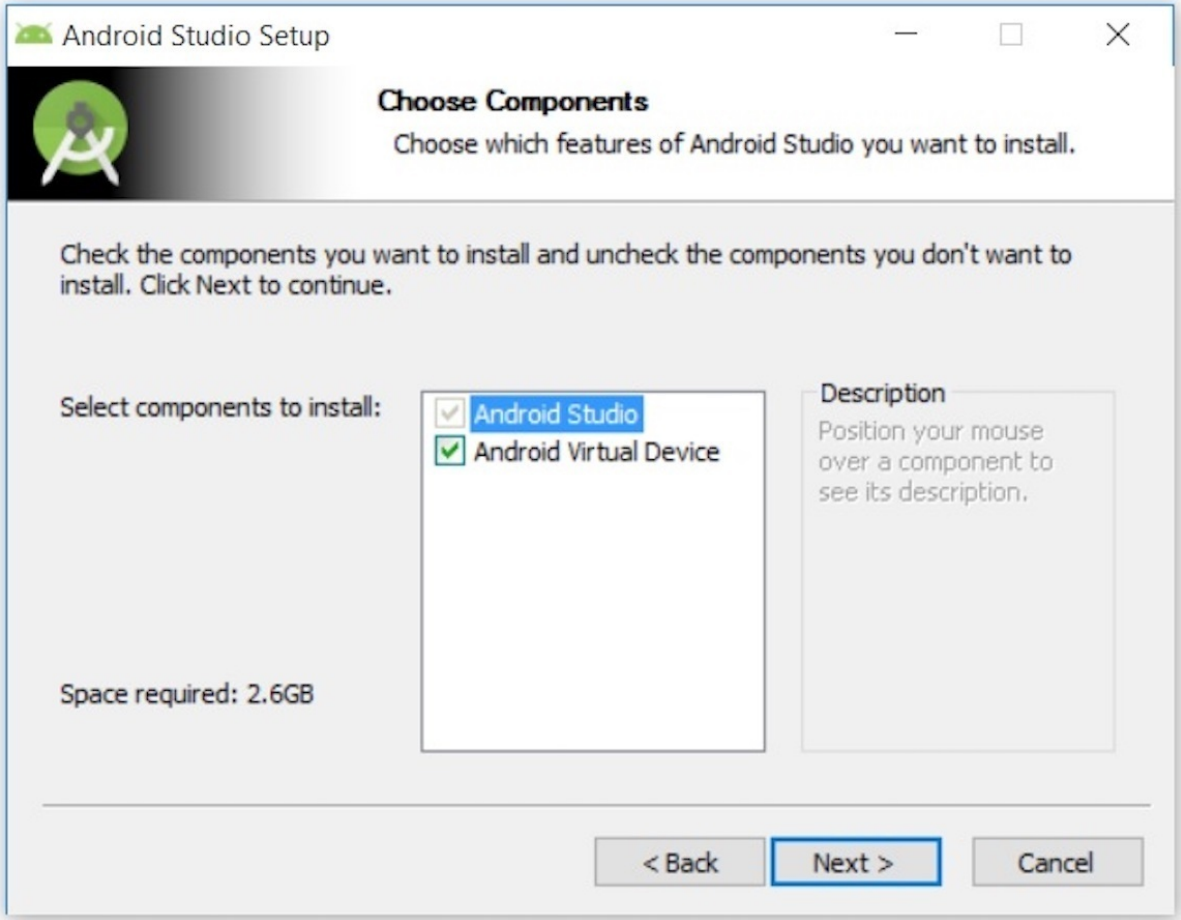
Figure 1. Set up Android Studio

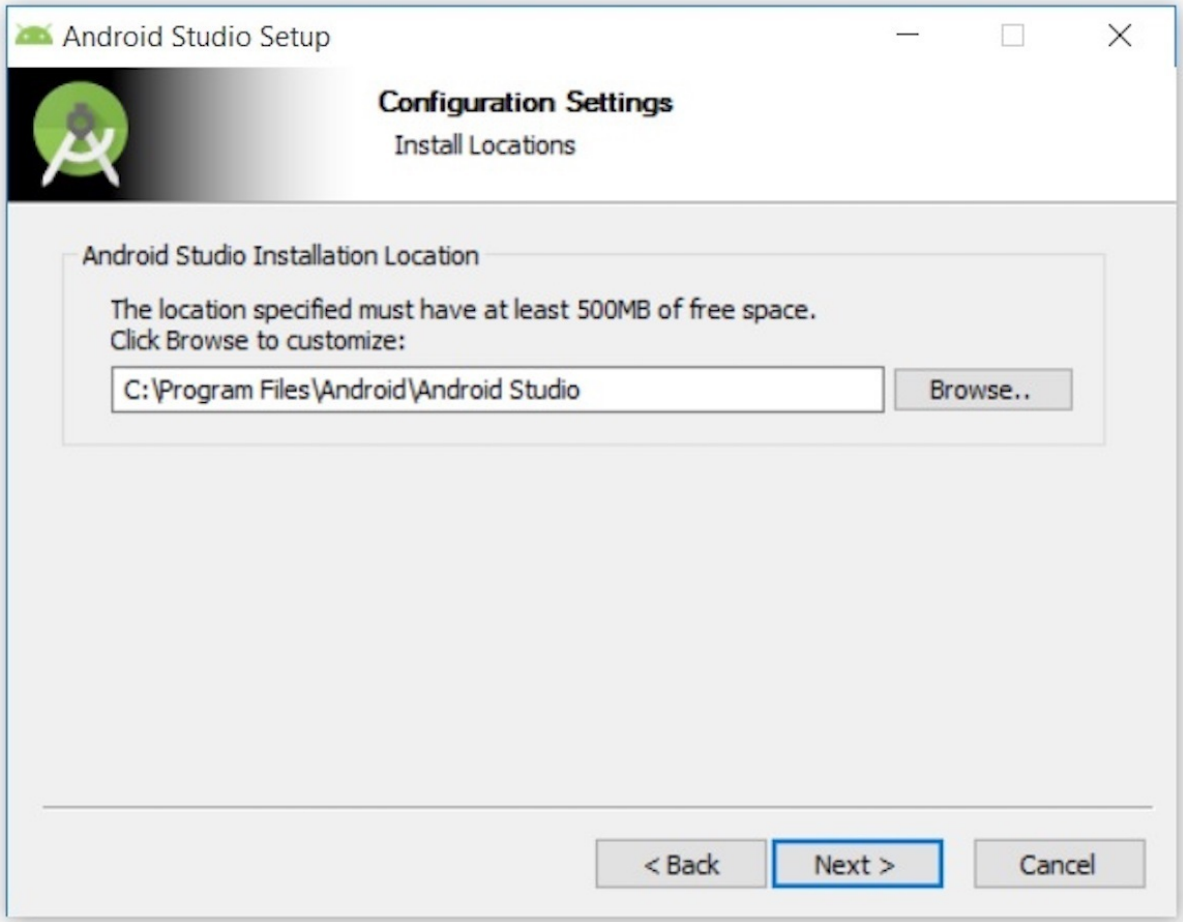
Clicking **Next** took me to the following panel, which provides the option to decline installing an Android Virtual Device (AVD).



Jeff Friesen

Figure 2. Install an Android AVD?

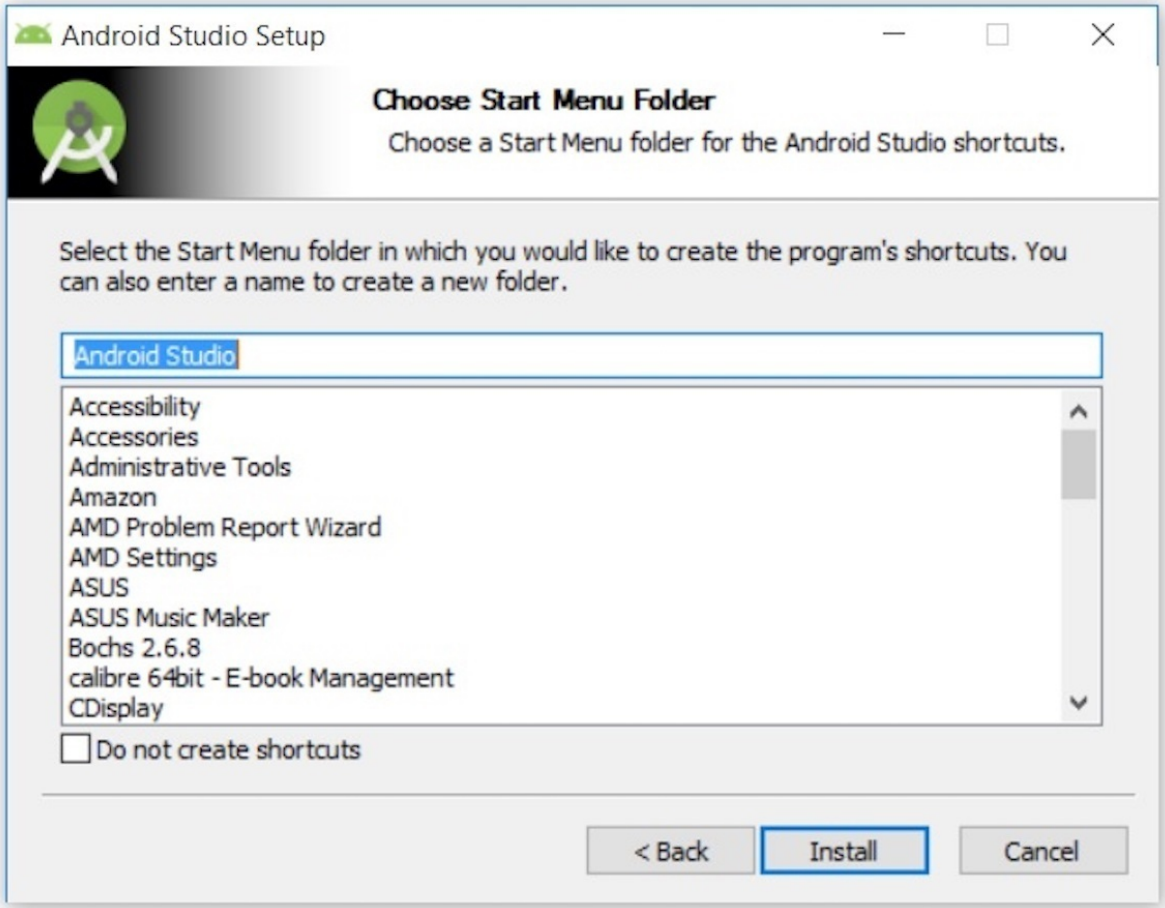
I chose to keep the default settings. After clicking **Next**, I was taken to the **Configuration Settings** panel, where I was asked to choose where to install Android Studio.



Jeff Friesen

Figure 3. The installation location must have at least 500 MB free space

I kept the default installation location and clicked **Next**, and was greeted with the **Choose Start Menu Folder** panel.



Jeff Friesen

Figure 4. Select the folder in which to store Android Studio shortcuts

I kept the default setting and clicked **Install**. The following **Installing** panel appeared:

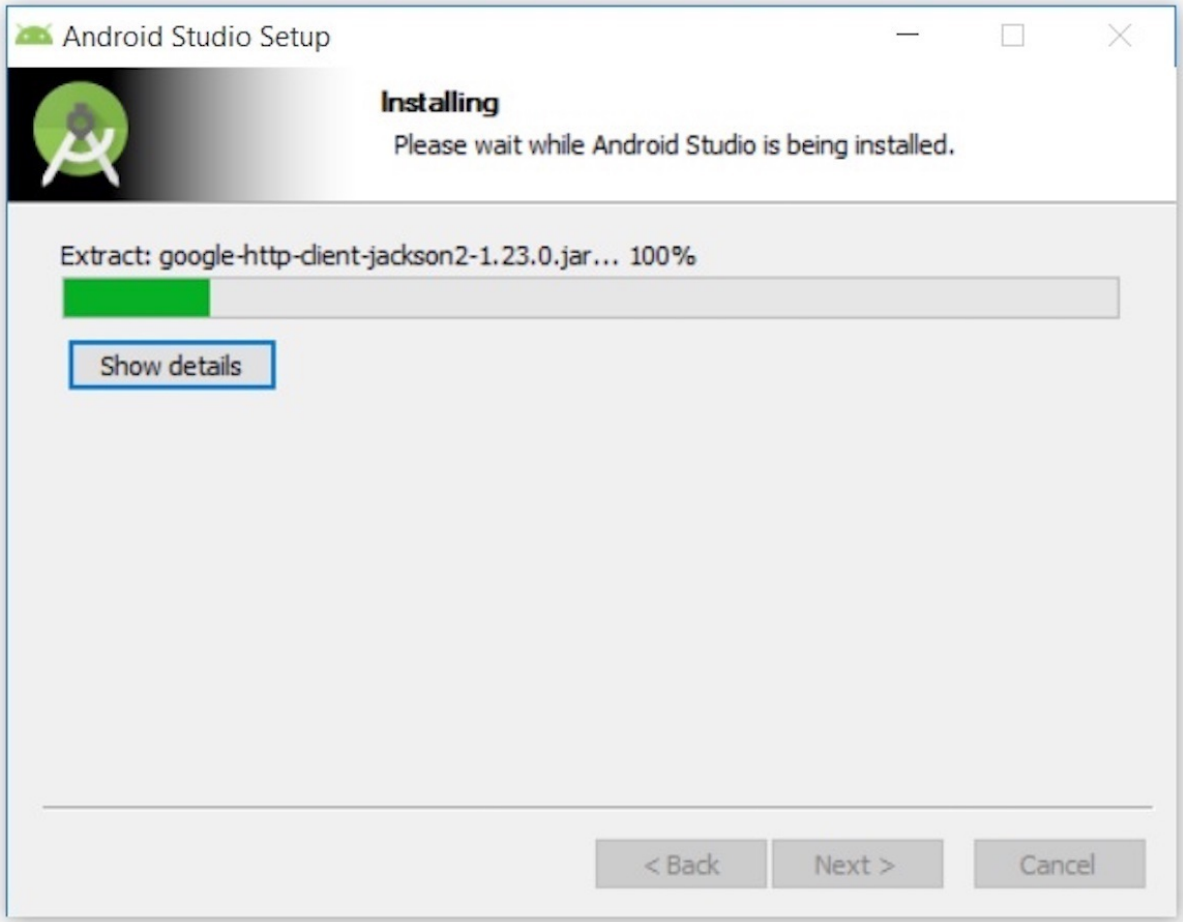


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Figure 5. This panel shows the progress of the installation

Clicking **Show details** causes the names of files being installed and other activities to be displayed. When installation finished, the **Installation Complete** panel appeared.

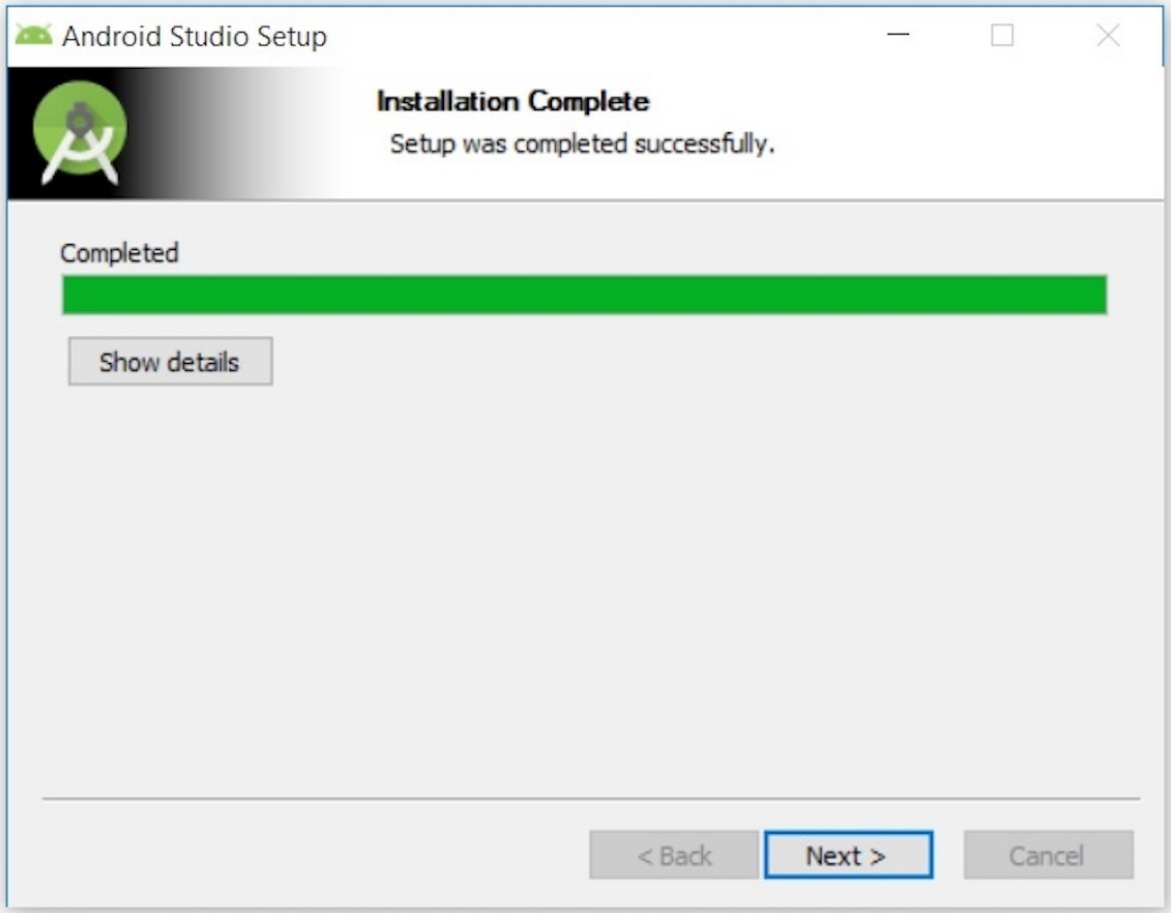

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Figure 6. The Next button is enabled when installation completes

After clicking **Next**, the installer presented the **Completing Android Studio Setup** panel.

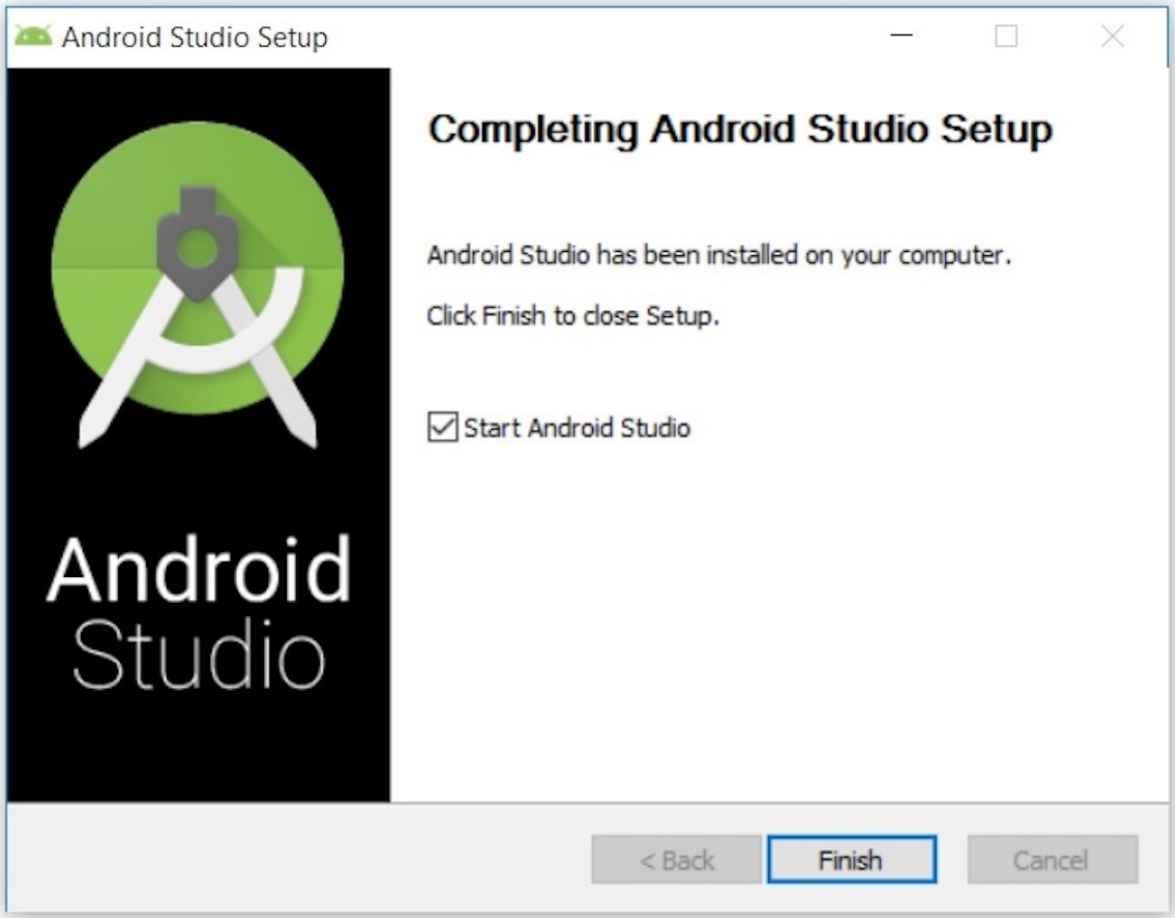

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Figure 7. Leave the Start Android Studio checkbox checked to run this software

To complete the installation, I left the **Start Android Studio** box checked and clicked **Finish**.

Running Android Studio

The first time Android Studio runs, it presents a **Complete Installation** dialog box that offers the option of importing settings from a previous installation.

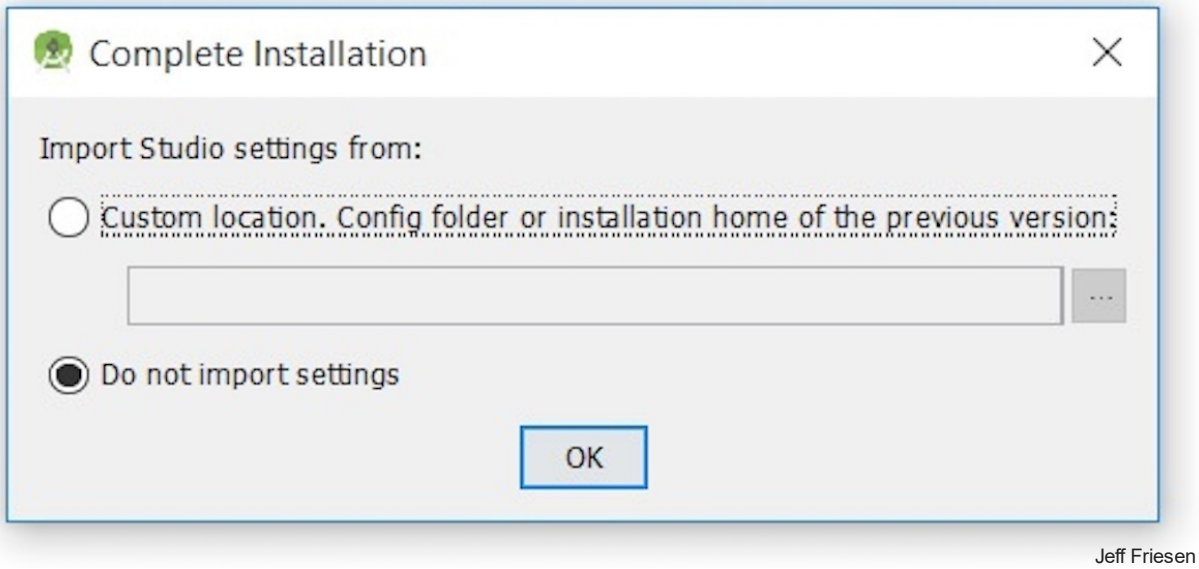

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Figure 8. A previous installation's settings can be imported

I chose not to import settings (the default selection) and clicked **OK**, and was rewarded with the following splash screen:

Figure 9. Android Studio's splash screen

I also observed the following **Finding Available SDK Components** message box.

Figure 10. Android Studio downloads any SDK components that are needed (and

available)

At this point, Android Studio presented the following **Android Studio Setup Wizard** dialog box:

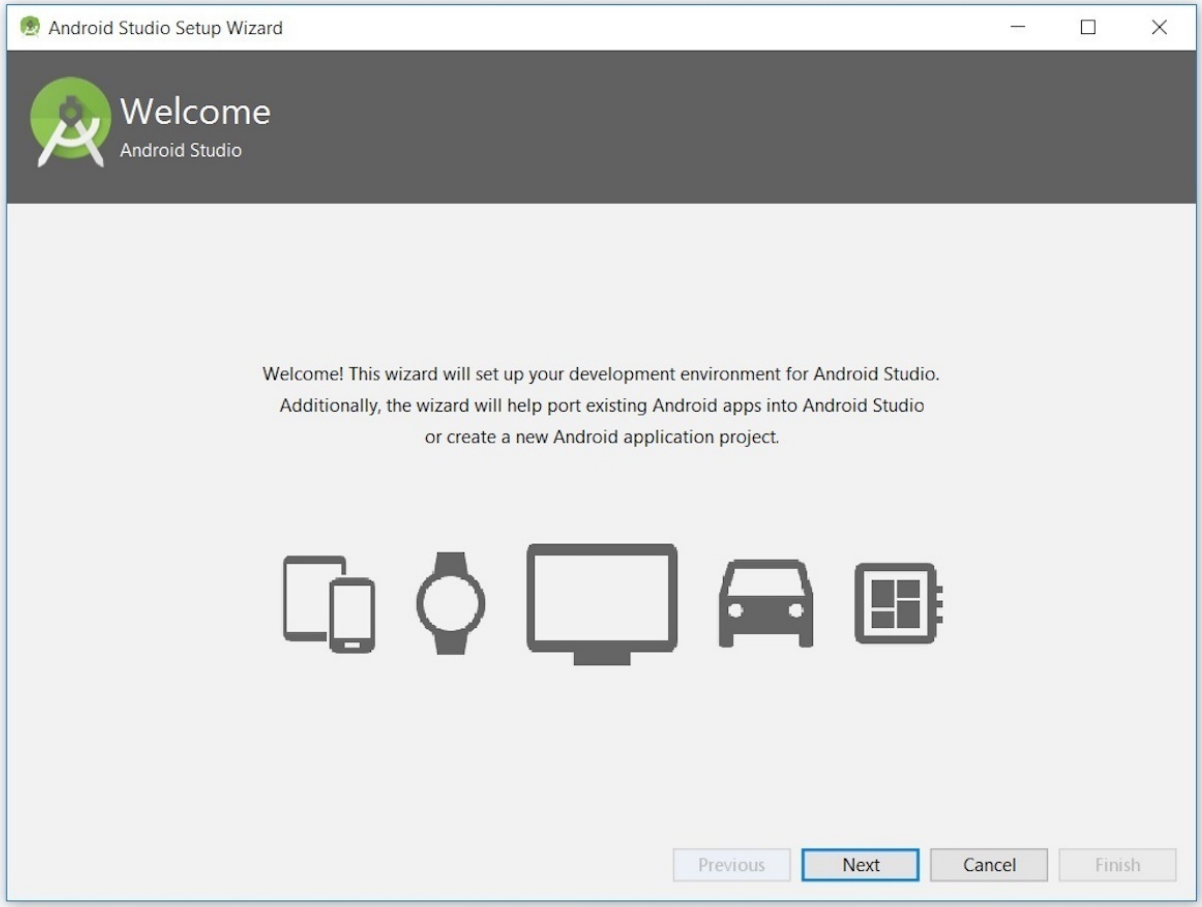

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Figure 11. The wizard provides setup and app-porting capabilities

I clicked **Next**, and the wizard invited me to select an installation type. I kept the default standard setting.

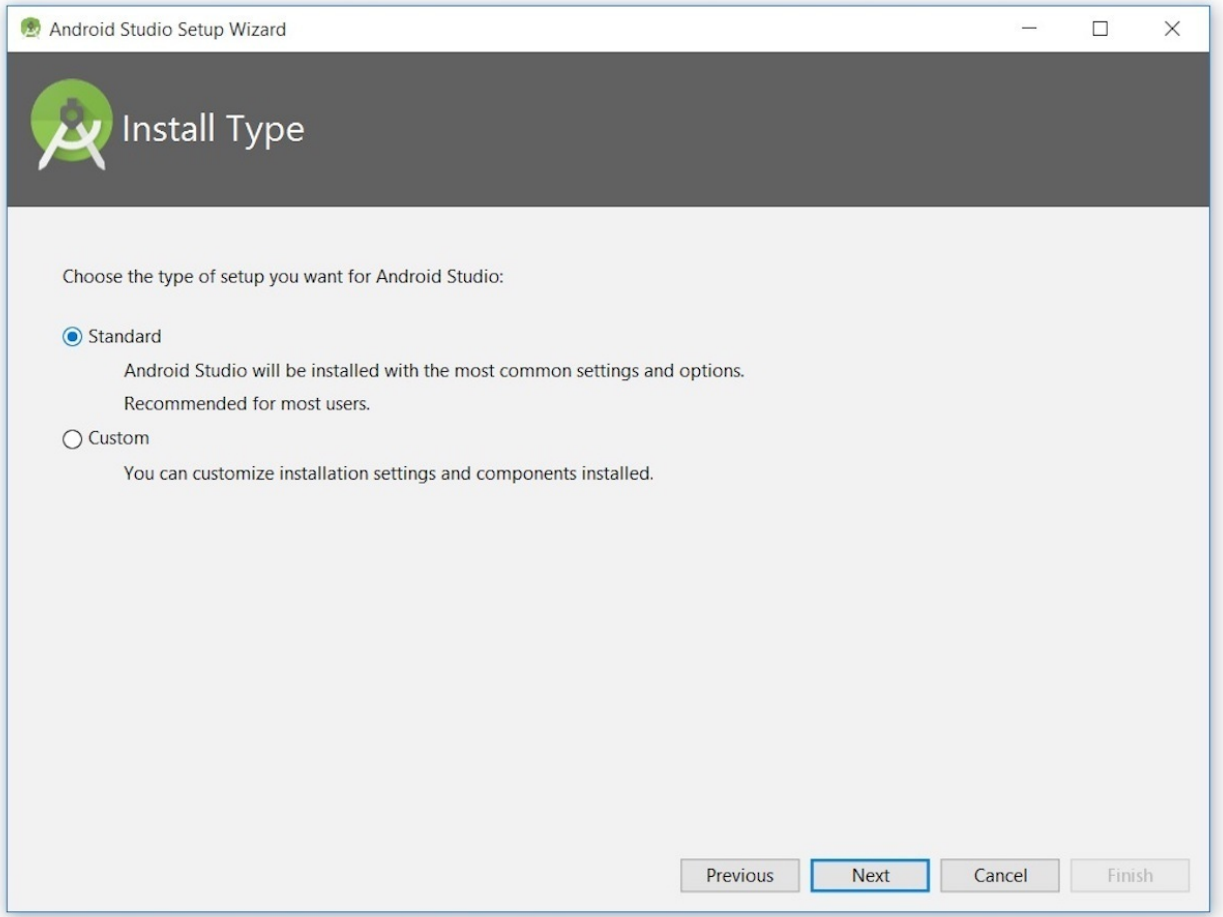

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Figure 12. Choose an installation type

I was then given the opportunity to choose a user interface theme.

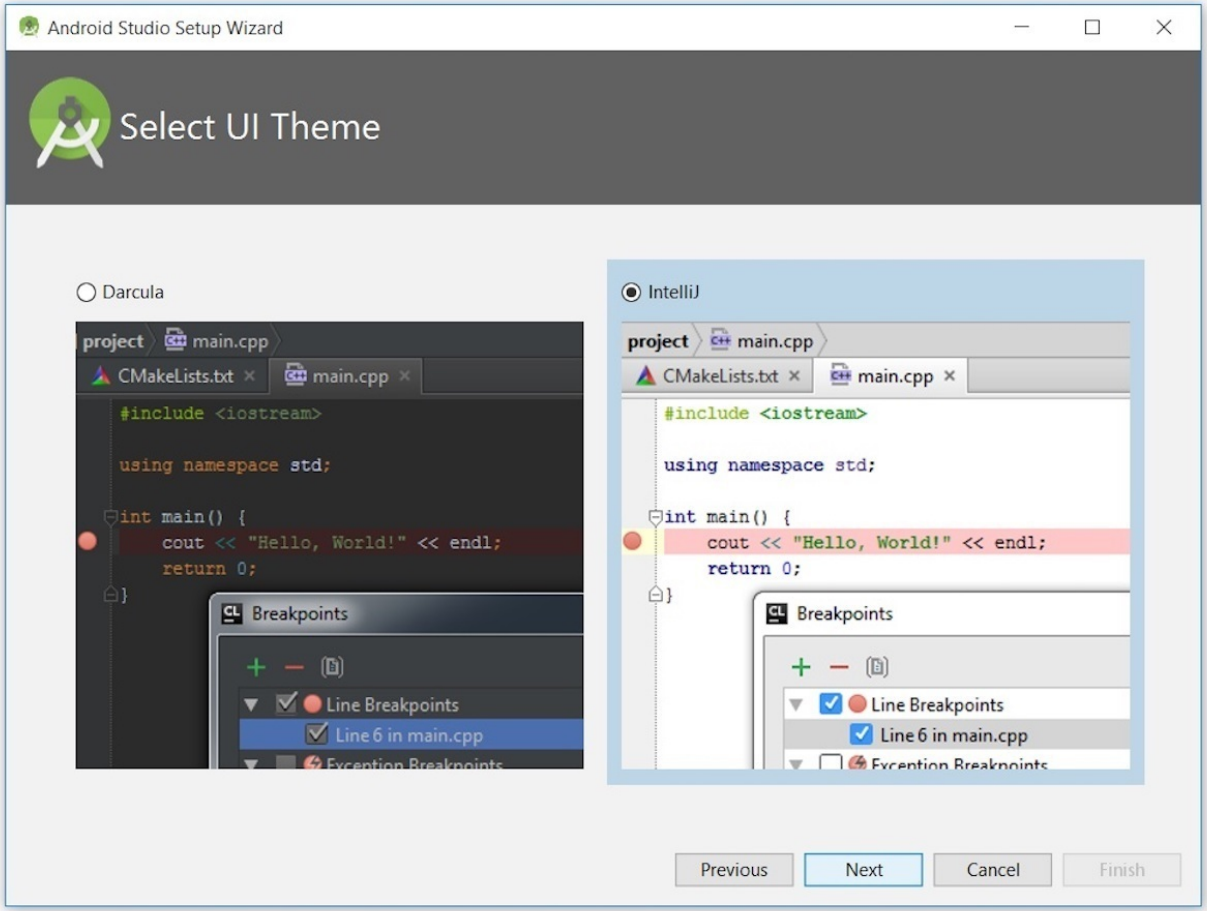

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Figure 13. Put the bite on Android Studio by choosing the Darcula theme

I kept the default **IntelliJ** setting and clicked **Next**. Android Studio next provided the opportunity to verify settings.

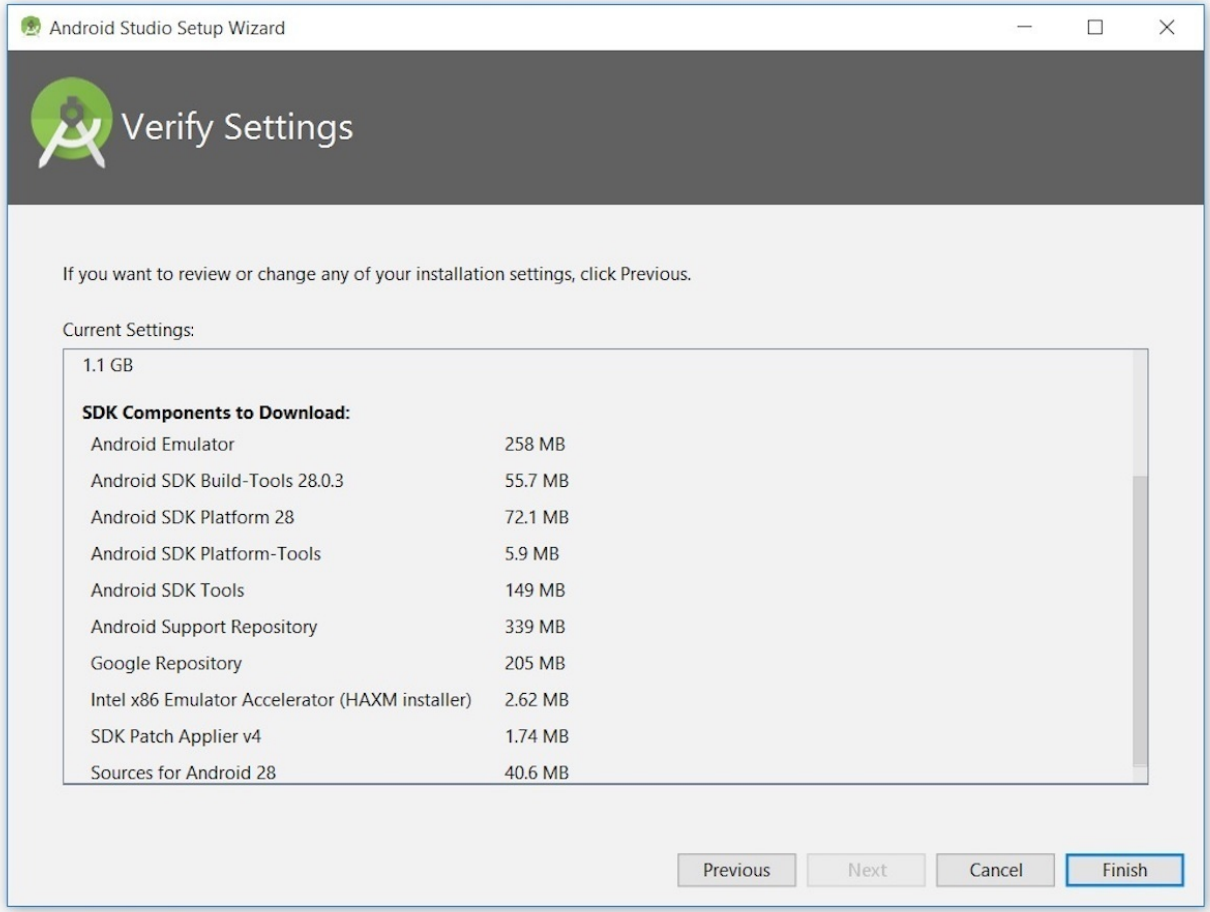

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Figure 14. Android Studio identifies additional SDK components that will be downloaded (click to enlarge)

I clicked **Finish** and Android Studio began the process of downloading SDK components.

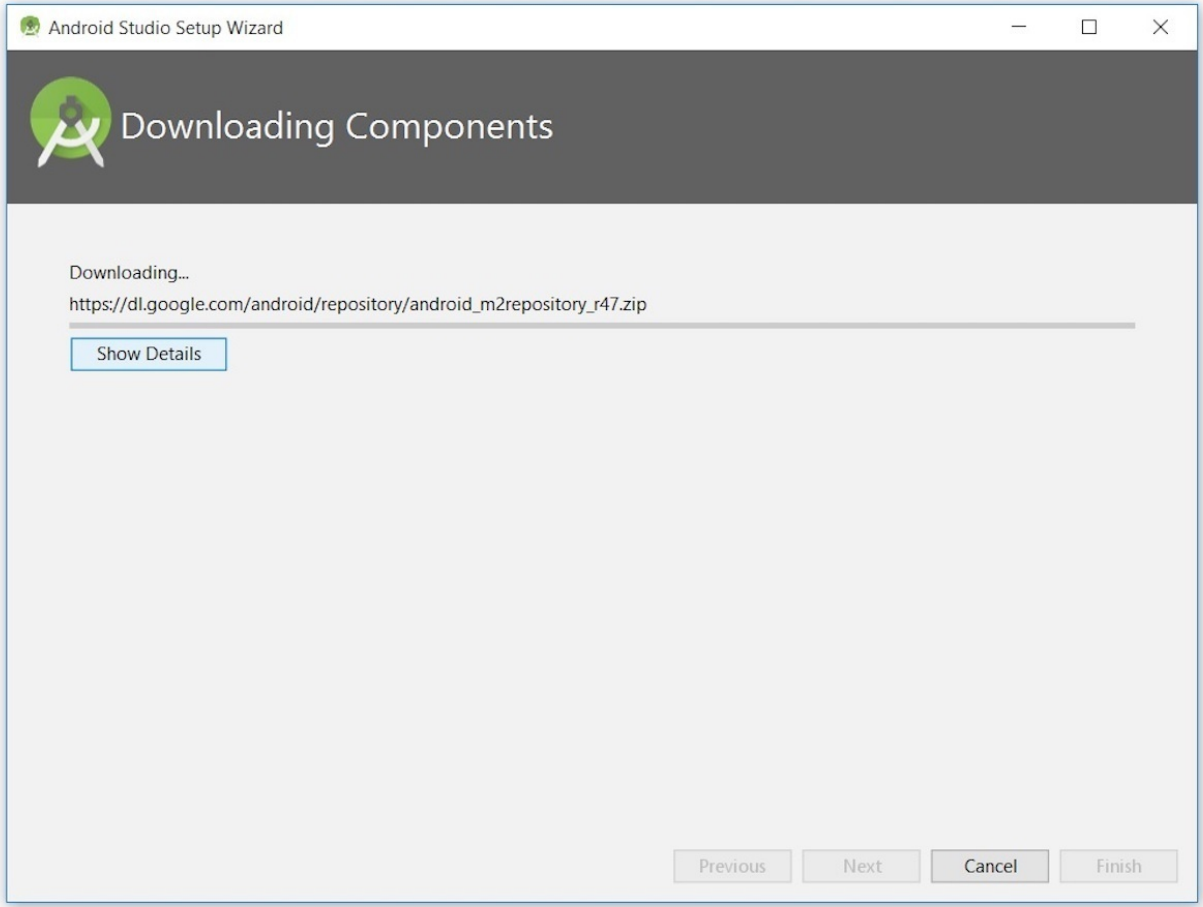

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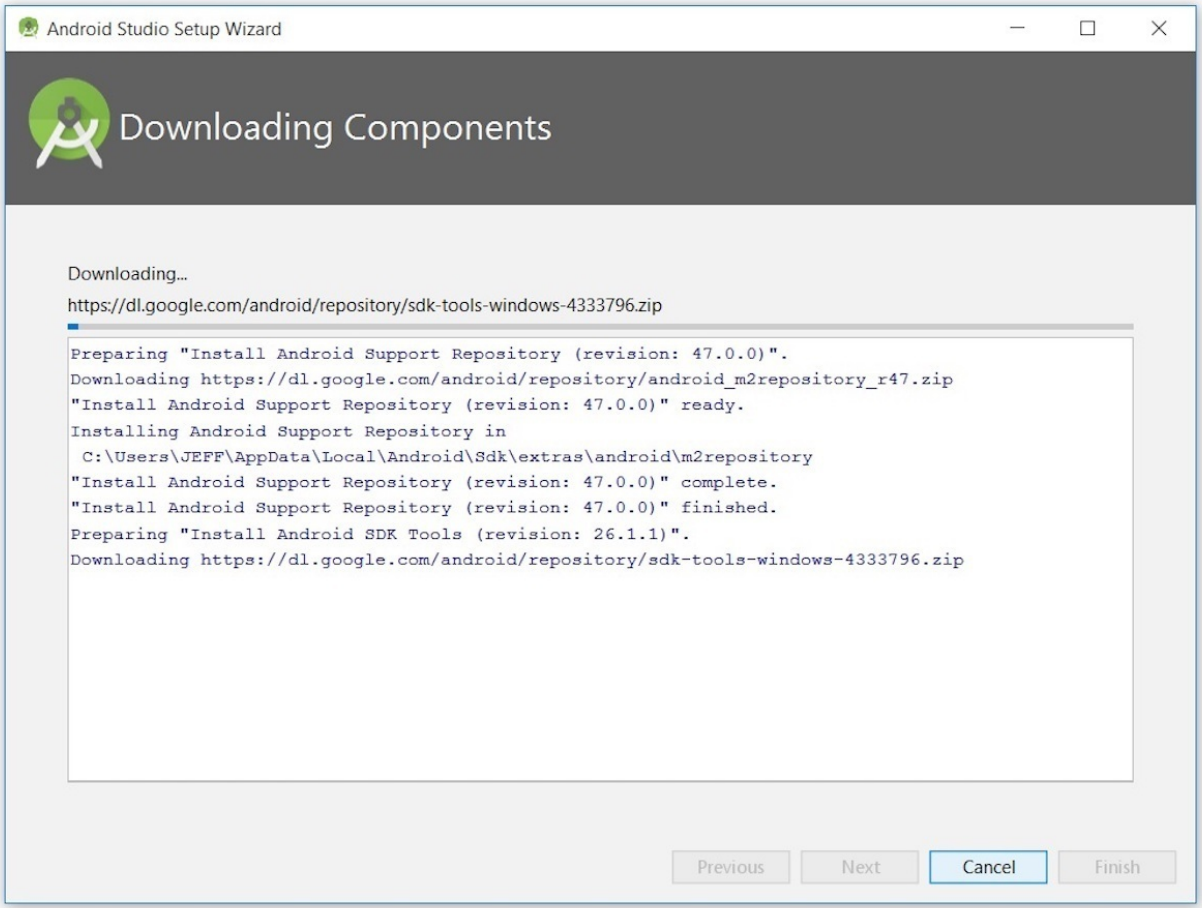
Figure 15. The wizard downloads and unzips SDK components

It can take several minutes for this part of the setup to finish. Clicking **Show Details** might relieve some boredom by revealing the various files being downloaded and unzipped.



Jeff Friesen

Figure 16. The wizard identifies the various archives being downloaded

For my AMD-based computer, an unpleasant surprise awaited after the components had completely downloaded and unzipped:

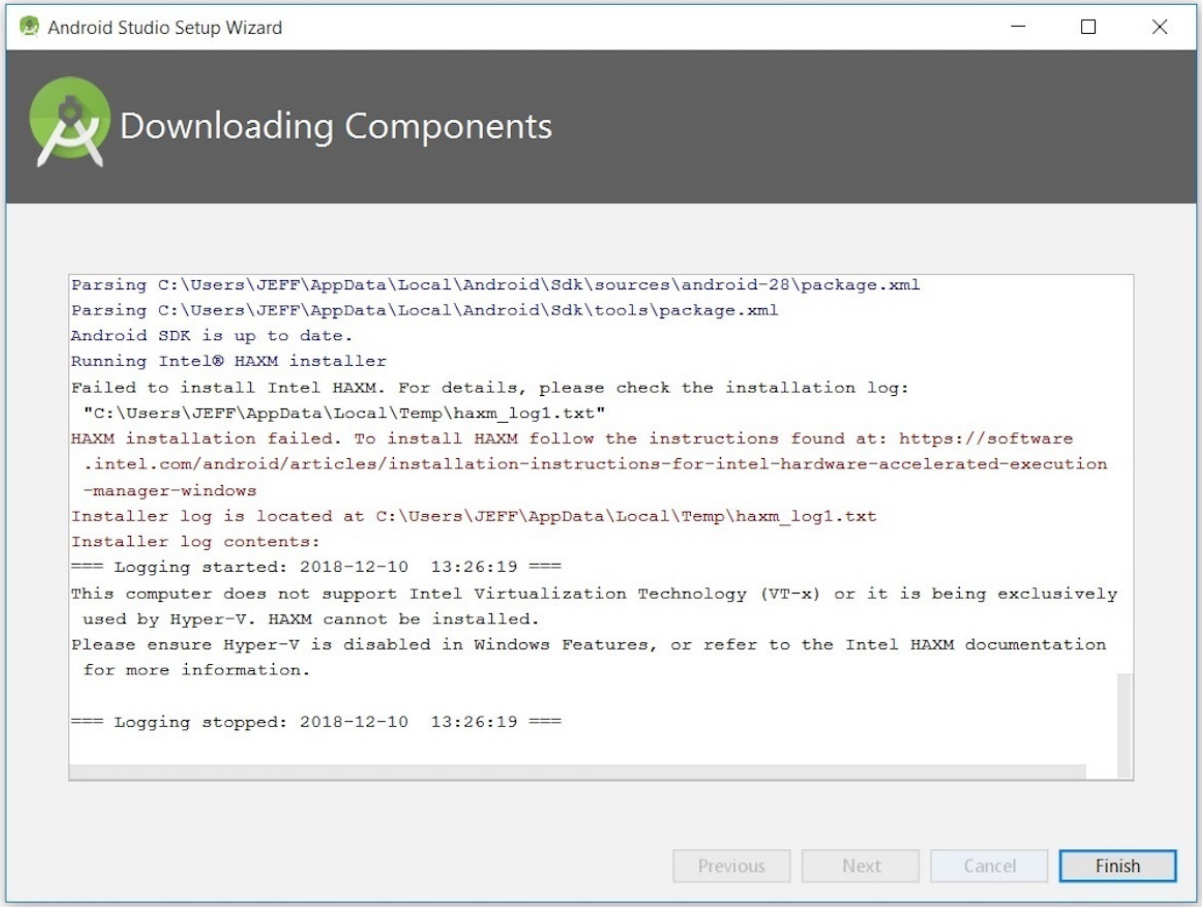


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Figure 17. Intel-based hardware acceleration is unavailable

My options are to either put up with the slow emulator or use an Android device to speed up development. In Part 3 I'll show you how I resolved this issue.

Finally, I clicked **Finish** to complete the wizard. The **Welcome to Android Studio** dialog box appeared.

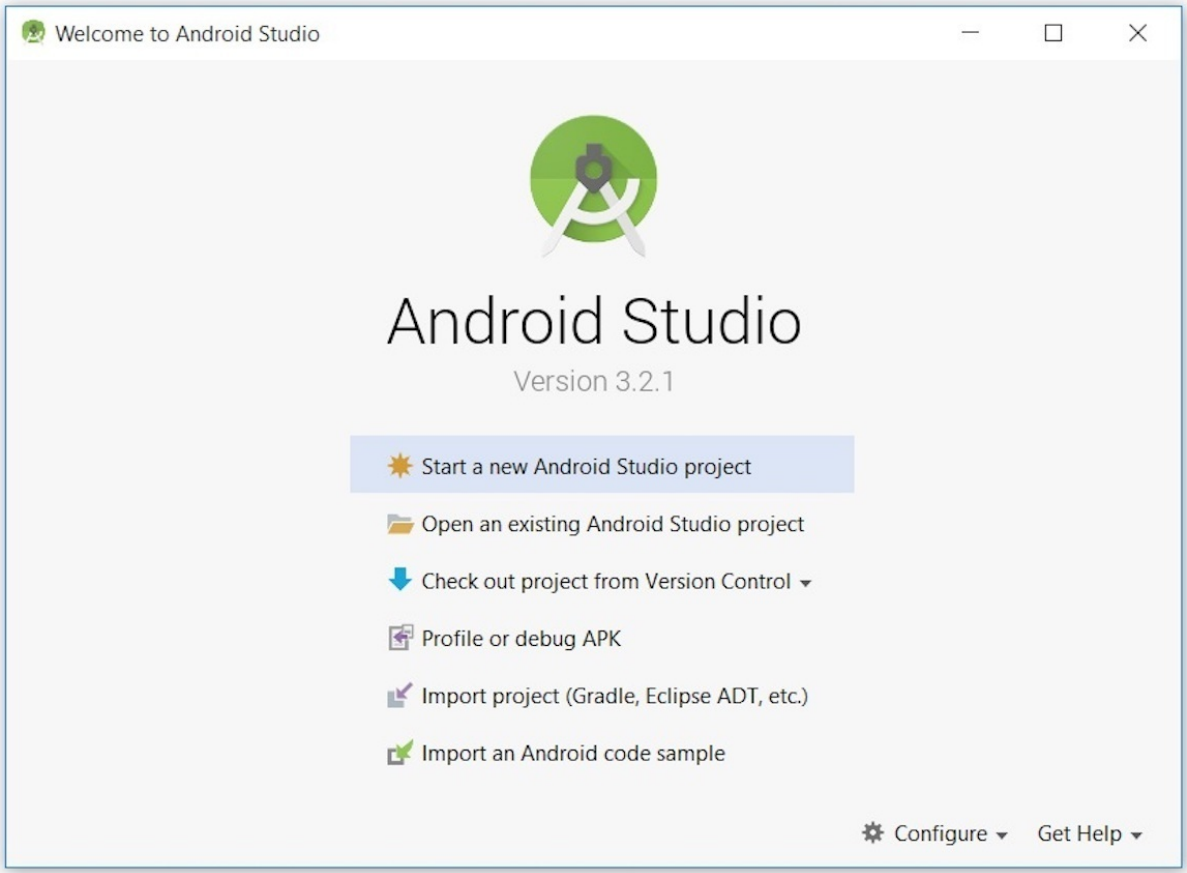

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Figure 18. Welcome to Android Studio

This dialog box is used to start up a new Android Studio project, work with an existing project, and more. It can be accessed by selecting **Android Studio** from the Windows **Start** menu, or the equivalent on another platform.

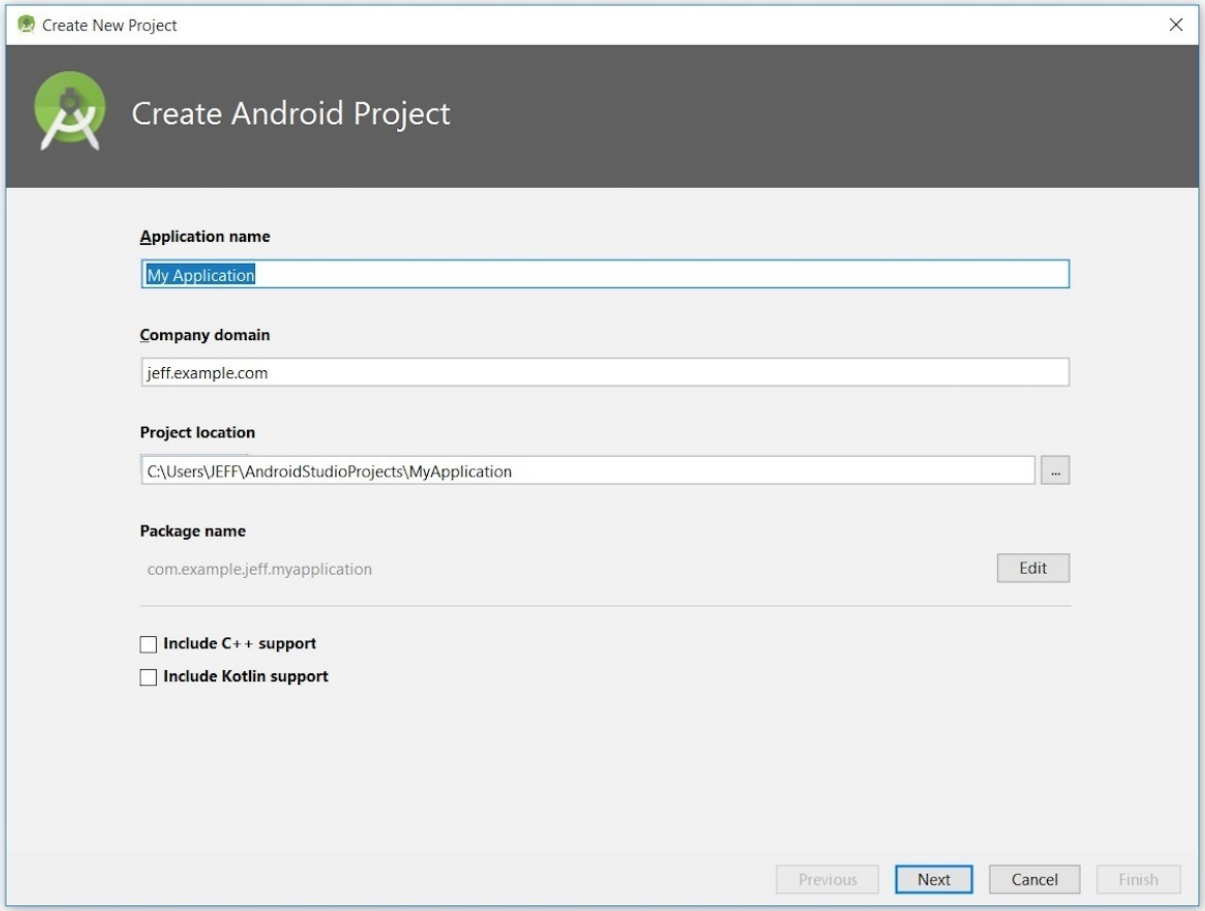
Your first Android Studio mobile app

The quickest way to get to know Android Studio is to use it to develop an app. We'll start with a variation on the "Hello, World" application: a little mobile app that displays a "Welcome to Android" message.

In the steps that follow, you'll start a new Android Studio project and get to know the main window, including the editor window that you'll use to code the app in Part 2.

Starting a new project

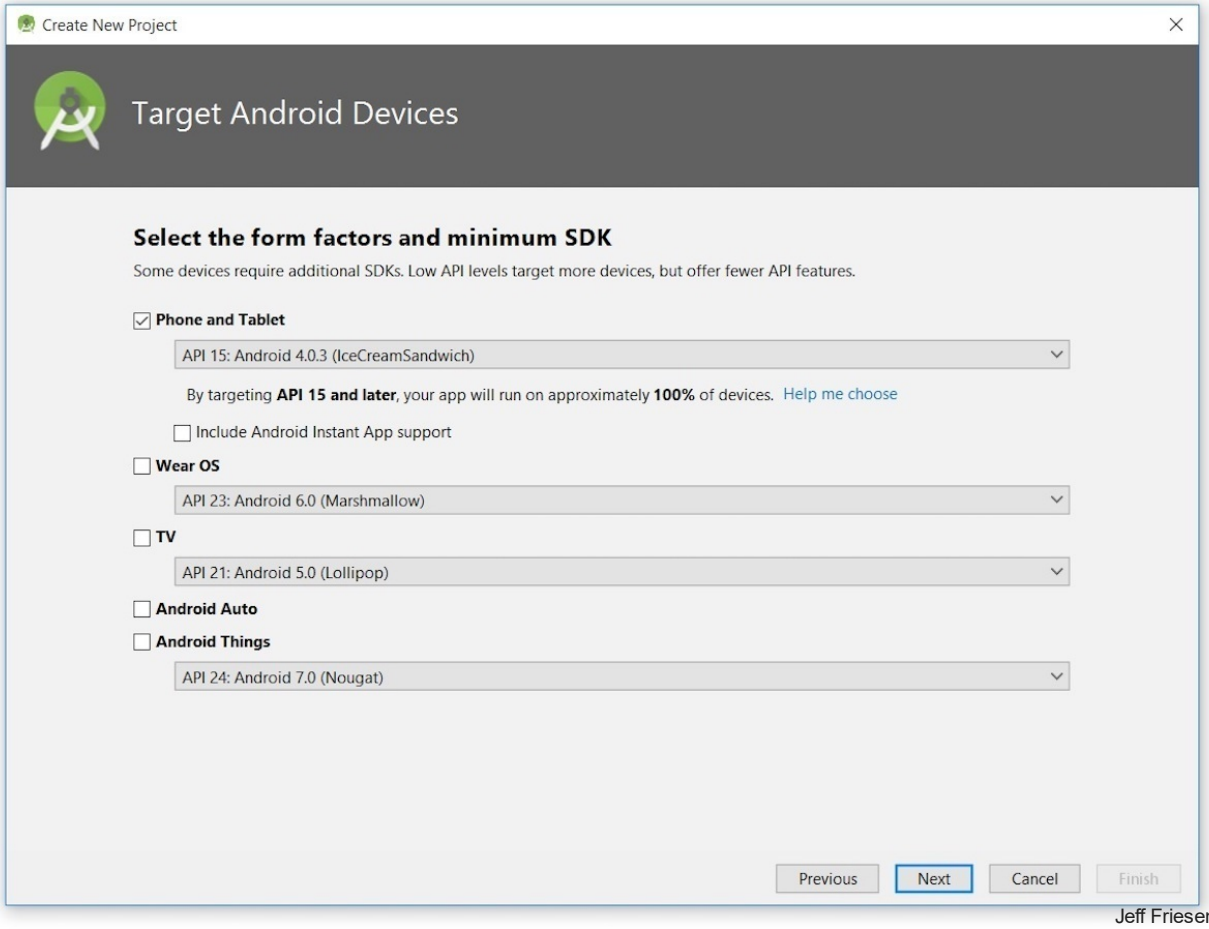
From our setup so far, you should still have Android Studio running with the **Welcome to Android Studio** dialog box. From here, click **Start a new Android Studio project**. Android Studio will respond with the **Create New Project** dialog box shown in Figure 19.



Jeff Friesen

Figure 19. Create a new Android project

Enter **W2A** (Welcome to Android) as the application name and **javajeff.ca** as the company domain name. On my desktop, I observed **C:\Users\JEFF\AndroidStudioProjects\W2A** as the project location. Click **Next** to select your target devices.

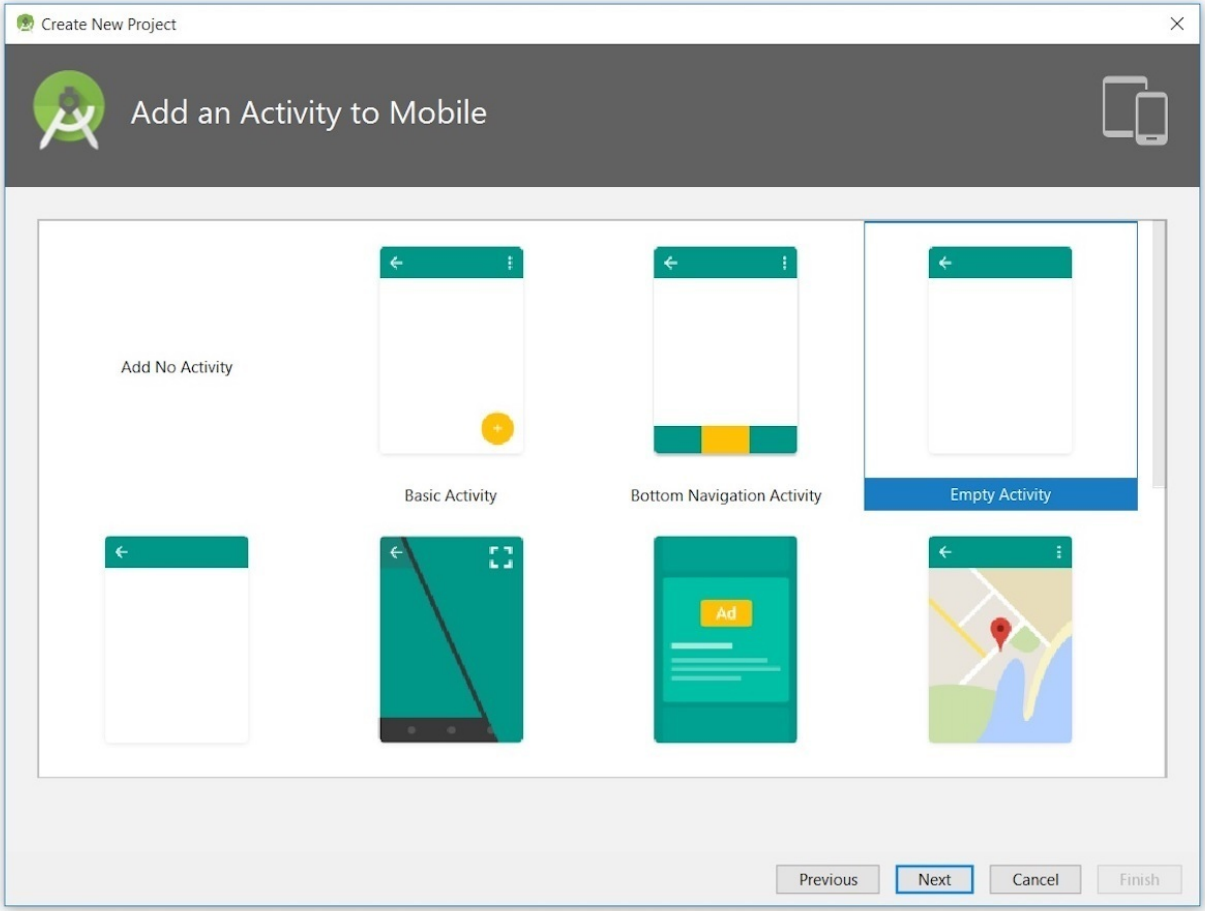


Jeff Friesen

Figure 20. Select your target device categories

Android Studio lets you select *form factors*, or categories of target devices, for every app you create. I kept the default setting.

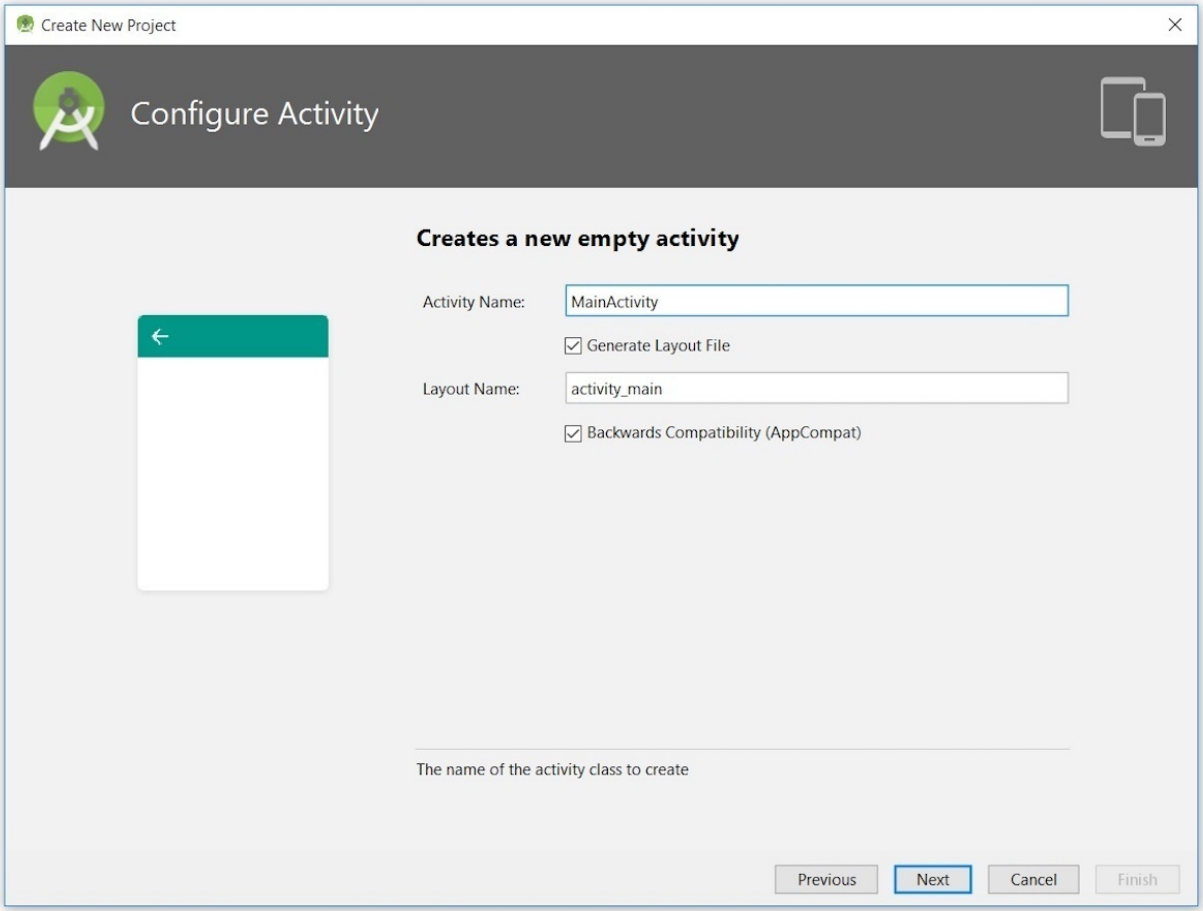
Click **Next**, and you will be given the opportunity to choose a template for your app's main activity. For now we'll stick with **Empty Activity**. Select this template (if necessary) and click **Next**.



Jeff Friesen

Figure 21. Specify an activity template

Next you'll customize the activity:



Jeff Friesen

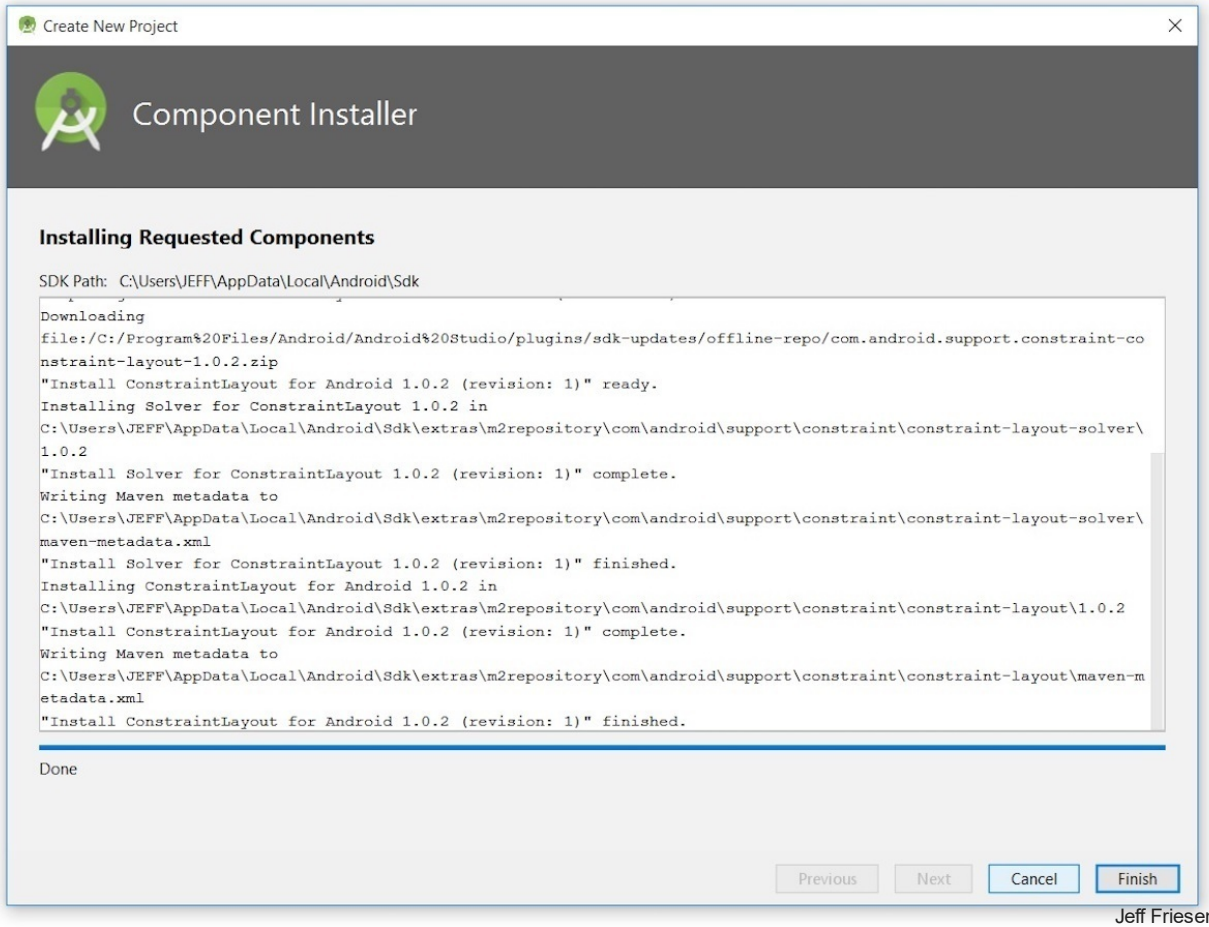
Figure 22. Customize your activity

Enter **W2A** as the activity name and **main** as the layout name, and click **Next** to complete this step.

Reconfigured buttons

The next time you create an app for the chosen target device category, you'll probably discover that **Next** is disabled and **Finish** is enabled.

The first time you use Android Studio, you'll discover that it has to download some files related to its constraint layout, which is used to build responsive user interfaces:



Jeff Friesen

Figure 23. Constraint layout is the default layout used by Android Studio for new app projects

Android Studio enables **Finish** after downloading the constraint layout files. Click this button and Android Studio takes you to the main window.

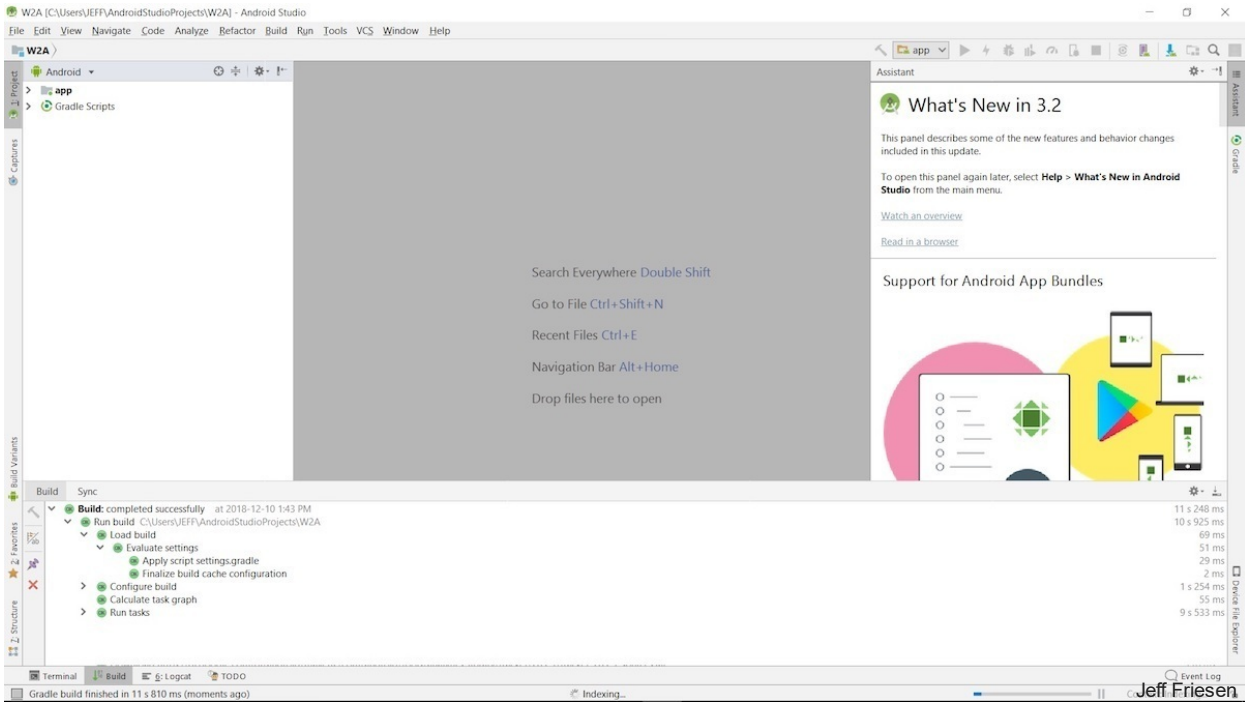


Figure 24. Android Studio's main window reveals that it has built a skeletal W2A app

The main window is divided into a menu bar and several other areas, which are identified in Figures 25 and 26. (*Note that Figures 25 and 26 are courtesy of Google.*)

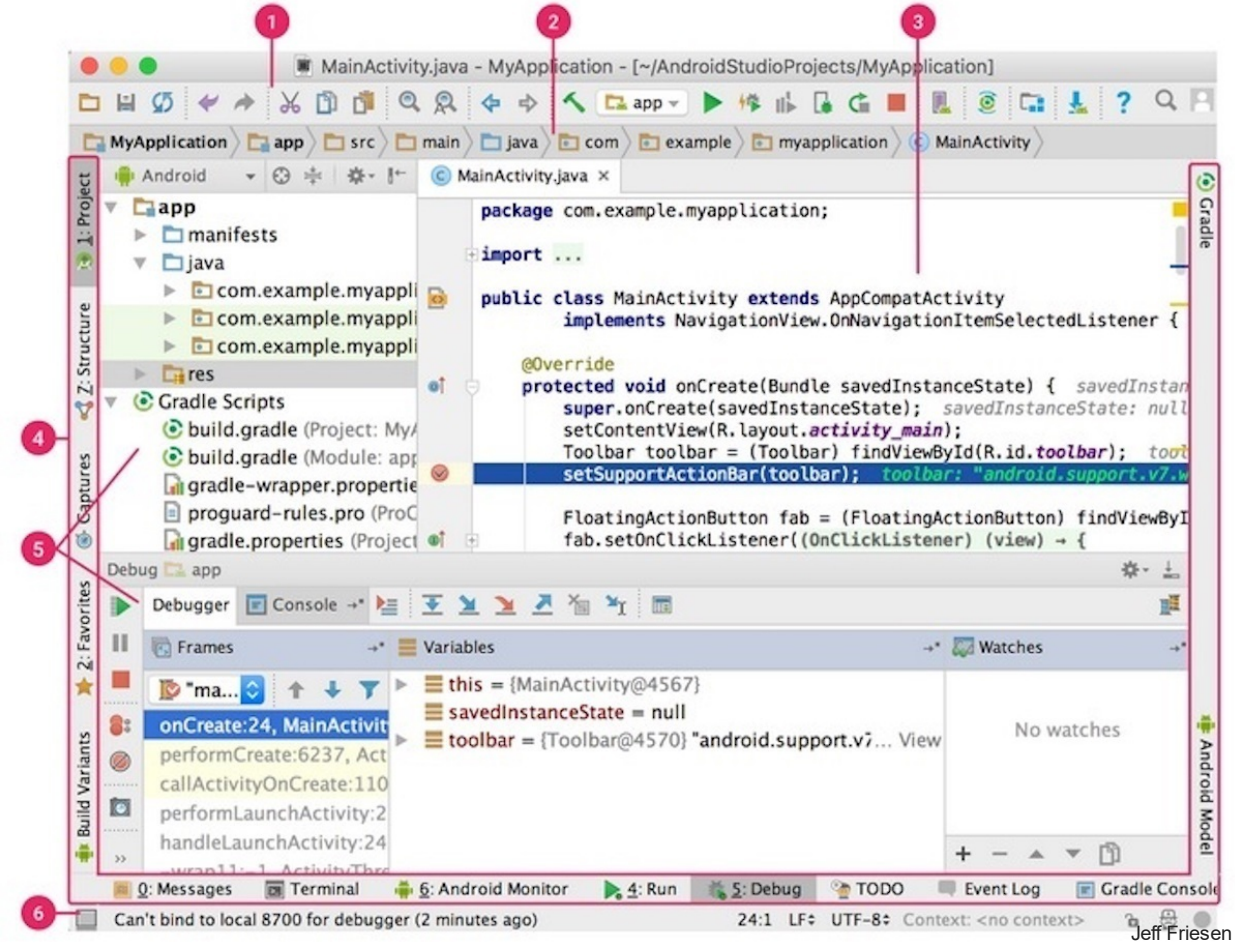


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Figure 25. The different areas that comprise the main window

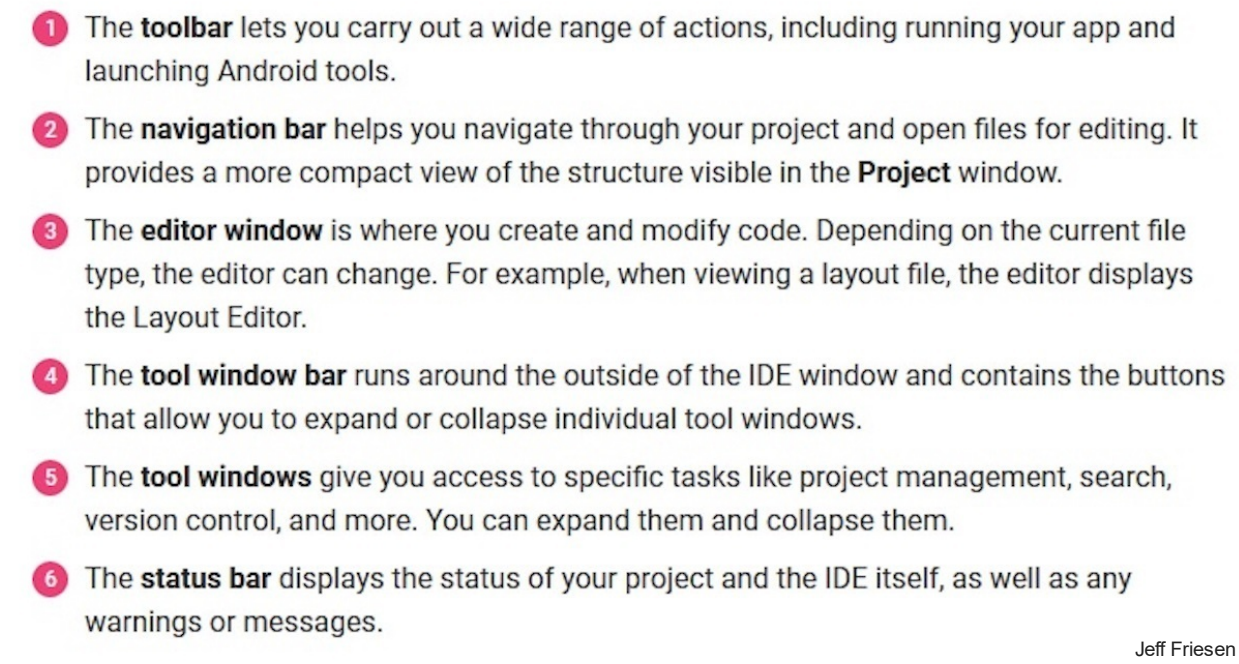

Figure 26. The main window presenting a toolbar, editor window(s), and other features

Accessing AVD Manager and SDK Manager

To access the traditional AVD Manager or SDK Manager, select **AVD Manager** or **SDK Manager** from Android Studio's **Tools** menu.

The Project and editor windows

When you enter the main window (see Figure 24), you observe the Project window showing only **app** and **Gradle Scripts**. You'll have to expand the **app** branch of the project tree to observe more details.

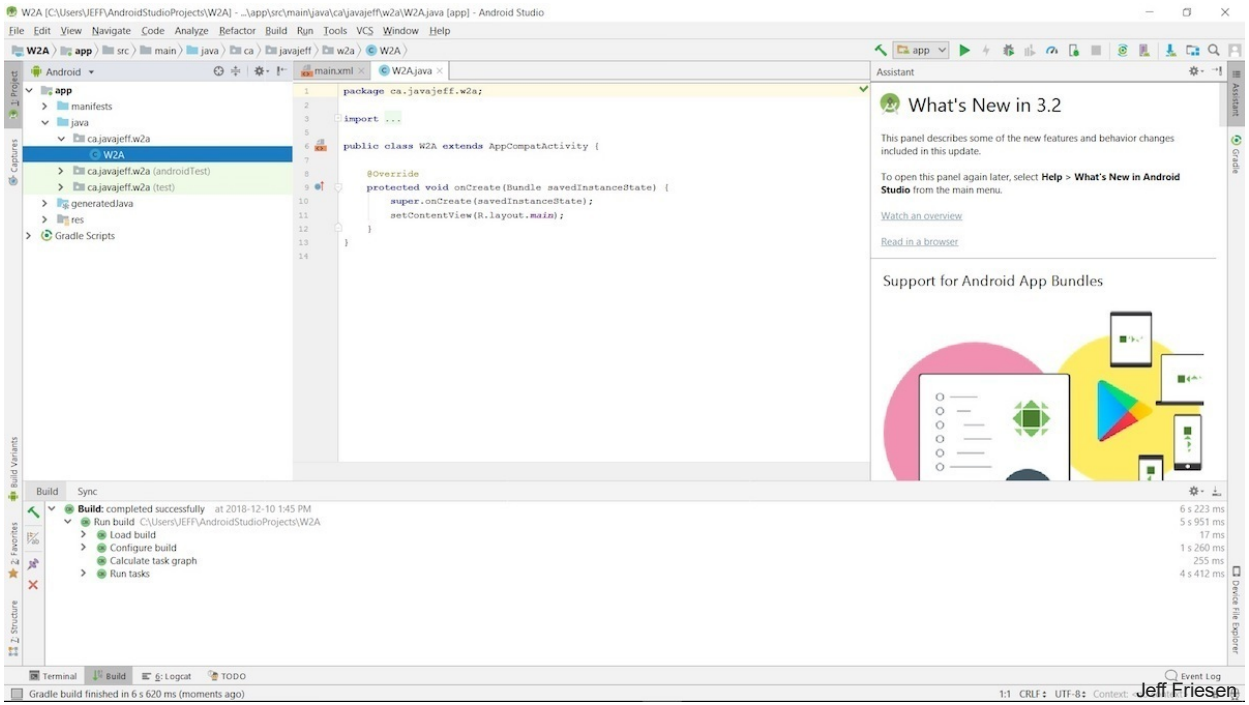

Figure 27. The Project window and an editor window show the skeletal W2A activity source code

The Project window is organized into a tree whose main branches are **app** and **Gradle Scripts**. The **app** branch is further organized into **manifests**, **java**, **generatedJava**, and **res** subbranches:

- **manifests** stores `AndroidManifest.xml`, which is an XML file that describes the structure of an Android app. This file also records permission settings (where applicable) and other details about the app.
- **java** stores an app's Java source files according to a package hierarchy, which is `ca.javajeff.w2a` in this example. It also organizes files for testing purposes.
- **res** stores an app's resource files, which are organized into **drawable**, **layout**, **mipmap**, and **values** subbranches:
    - **drawable** is a mostly empty location in which to store an app's artwork; initially, the XML files for the launcher foreground and background adaptive icons are stored here.

- **layout** is a location containing an app's layout files; `main.xml` (the main activity's layout file) is initially stored here.
- **mipmap** is a location containing various `ic_launcher.png` files, which store launcher screen icons of different resolutions.
- **values** is a location containing `colors.xml`, `strings.xml`, and `styles.xml`.

The **Gradle Scripts** branch identifies various `.gradle` (such as `build.gradle`) and `.properties` (such as `local.properties`) files that are used by Android Studio's Gradle-based build system.

Branch names and directory/file names
Each branch/subbranch corresponds to a directory name or to a file name. For example, **res** corresponds to the `res` directory and **strings.xml** corresponds to the `strings.xml` file.

Conclusion to Part 1

You've installed and configured Android Studio and created a project for your first Android Studio mobile app; now you're ready to build your Android application. In Android Studio, this means populating your new project with Java source code and resource files. Turn to Part 2 when you're ready to code your first Android animated mobile app.

This story, "Android Studio for beginners, Part 1: Installation and setup" was originally published by JavaWorld.