Using Android Emulator Virtual Devices

You can use Android Emulator to create emulations of Android devices that run your own custom Android system images. You can also share your custom Android system images so that other people can run emulations of them. In addition, you can add multi-display support to Android Emulator emulations.

Android Emulator architecture

Android Emulator allows you to run emulations of Android devices on Windows, macOS or Linux machines. The Android Emulator runs the Android operating system in a virtual machine called an Android Virtual Device (AVD). The AVD contains the full Android software stack, and it runs as if it were on a physical device. Figure 1 is a diagram of the Android Emulator's high-level architecture. For more information about the emulator, see Run apps on the Android Emulator{.external}.

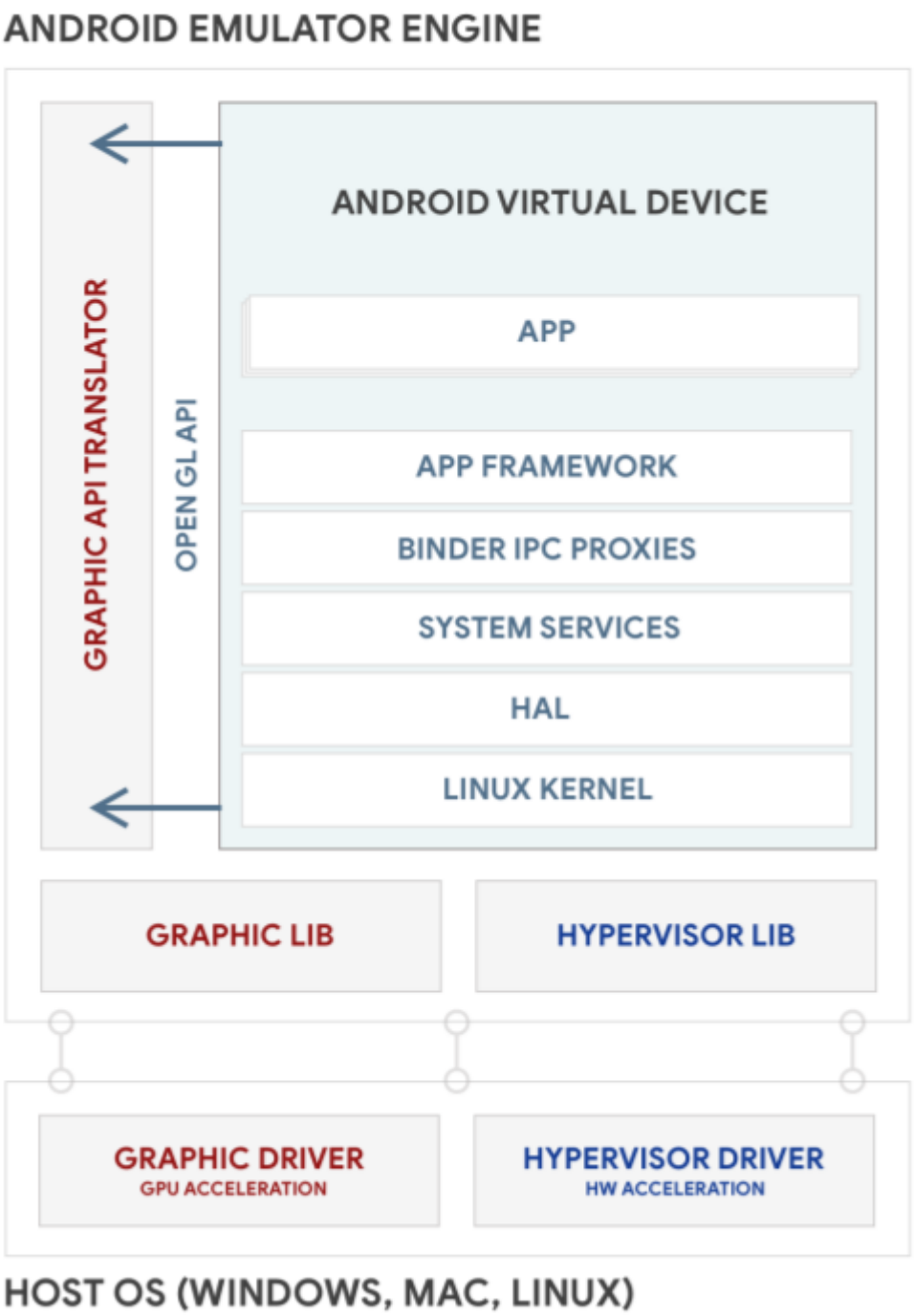

Figure 1. Android Emulator architecture

[Building AVD images]

Each AVD includes an Android system image, which runs in that AVD. The AVD Manager includes some system images. And you can build custom AVD system images from your source code and create device emulations to run them.

Note: You need to establish a build environment before building AVD system images.

To build and run an AVD system image:

1. Download the Android source:

   ```
   mkdir aosp-master; cd aosp-master
   repo init -u
   repo sync -j24
   ```

   If you want to build other Android versions, you can find their branch names in the public Android repository. They map to Android Codenames, Tags, and Build Numbers.

2. Build an AVD system image. This is the same process as building an Android device system image. For example, to build a x86 32-bit AVD:

   ```
   mkdir aosp-master; cd aosp-master
   source ./build/envsetup.sh
   lunch sdk_phone_x86
   make -j32
   ```

   If you prefer to build an x86 64-bit AVD, run `lunch` for the 64-bit target:

   ```
   lunch sdk_phone_x86_64
   ```

3. Run the AVD system image in the Android Emulator:

   ```
   emulator
   ```

See the Command-line startup options for more details about running the emulator. Figure 2 shows an example of the Android Emulator running an AVD.

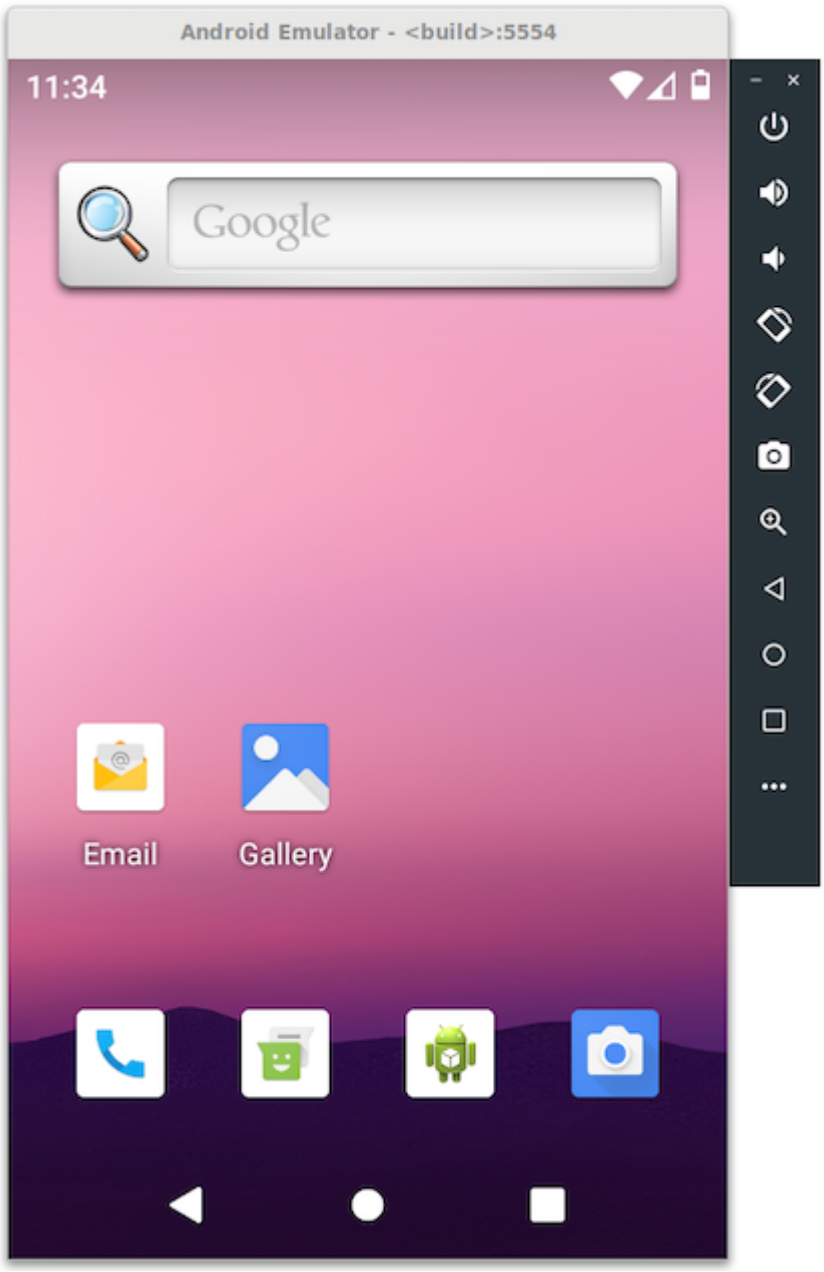

Figure 2. Android Emulator running an AVD