Introduction to Android

Android is a free and open source operating system based on the Linux kernel led and developed by Google and the Open Handset Alliance. Mainly used in mobile devices, such as smartphones and tablet computers, it has been widely used so far, expanding applications such as TVs, smart watches, and in-vehicle systems. Google has released the source code of Android under the authorization of the Apache open source license. The first Android smartphone was released in October 2008.

After 15 years of development, starting from Android 1.0, a total of 13 major versions of the Android operating system have been released, and the newly developed Android 14 system is expected to be released in mid-2023. When Google releases the Android version, it always names a dessert to arouse the interest of developers. The earliest versions of Android 1.0 and Android 1.1 only had version numbers and no dessert names. The habit of naming desserts starts from Android 1.5 version. Android 1.5 was named Cupcake (cupcake) until Android 10 reverted to numerical naming. The long-term development language of Android has been Java, but at the 2019 I/O conference, Google officially announced Kotlin-First, Kotlin has become the language of choice for Android development. Kotlin has the advantages of being safer and more concise than Java, and has a very It has a lot of syntactic sugar and has the title of "Swift in the Android world".

Android's important system architecture, from high to low, is the application layer (all applications installed on the mobile phone belong to this layer, such as the contacts, text messages and other programs that come with the system, or we get them from Google Play. Downloaded programs, including our own developed applications), application framework layer (this layer mainly provides APIs that may be used when building applications, some core applications that come with Android are completed using these APIs, developers can Build your own applications by using these APIs. For example, there are activity managers, View systems. Content providers, notification managers, etc.), system operation layer (this layer provides the main Android system through some C/C++ libraries Feature support, such as SQLite library provides database support, OpenGL|ES library provides 3D drawing support, Webkit library provides browser kernel support, etc. At the same time, there is also an Android runtime library at this layer, which provides some The core library allows developers to use Java to write Android applications. Among them, the key is the Dalvik virtual machine, which allows each of our Android applications to run in an independent process, and has its own instance of the Dalvik virtual machine, compared to Java virtual machine (JVM), Dalvik is specially customized for mobile devices, it optimizes the mobile phone memory, limited CPU performance, etc.), Linux layer (Android system is based on Linux 2.6 kernel, this layer is Android device The various hardware provides the underlying drivers, such as display drivers, audio drivers, camera drivers, Bluetooth drivers, WiFi drivers, power management, etc.). As developers, we are mostly in the role of application layer development.

The four major application components developed by Android are Activity (the main function is to display pages), Service (represents background services, provides the ability for applications to perform tasks in the background, and does not provide interface functions), and BroadcastReceiver (used to receive broadcast events, such as System power notification and broadcast by the application itself), Content Provider (used to access data across applications, providing cross-process capabilities, equivalent to a database).

At the same time, Andriod also provides a wealth of system controls. We can write beautiful interfaces, and we can also expand system controls and customize controls to meet our own needs. Common controls include: TextView, Button, EditText, and some layout controls. The Android system also comes with a SQLite database, which is a lightweight, fast-computing embedded relational database. It not only supports standard SQL syntax, but also can be operated through the API packaged by Android, making it very convenient to store and read data. Compared with PCs, mobile devices have geographical location positioning. Now Android phones have built-in With GPS, we can use GPS and combine our creativity to create a product based on LBS. The Android system provides a wealth of multimedia services, such as music, video, recording, camera, alarm, etc., all of which can be controlled by code in the program, making our applications more colorful. A variety of sensors are built into Android phones, such as acceleration sensors and orientation sensors. This is a major feature of mobile devices, and we can use these sensors flexibly.

Android SDK is an Android development toolkit provided by Google. When developing an Android program, we need to refer to the toolkit. The development tool can use Android Studio, which is very powerful. We can directly run the development program to the real device through Android Studio, or perform functional debugging through the emulator provided by Android Studio. It can also help us package the Apk file so that we can publish the application software on the Internet for others to download Install and use.