Android Versions

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## API Levels

An **API Level** is an integer value that identifies the **framework API revision** offered by a version of the Android platform. API Levels are also called **SDK Versions**.

The Android platform provides a framework API that applications can use to interact with the underlying Android system. This consists of:

* A core set of **packages** and **classes**.
* A set of XML elements and attributes for declaring a **manifest file**.
* A set of XML elements and attributes for declaring and accessing **resources**.
* A set of **intents**.
* A set of **permissions** that applications can request, as well as permission enforcements included in the system.

Thus, the API provides access to the system while hiding its complexity and providing security.

## Version History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Version Number(s)** | **Initial Stable Release Date** | **Supported (Security Fixes)** | **API Level** |
| Astro Boy (Unofficial) | 1.0 | September 23, 2008 | No | 1 |
| Bender (Unofficial) | 1.1 | February 9, 2009 | No | 2 |
| Cupcake | 1.5 | April 27, 2009 | No | 3 |
| Donut | 1.6 | September 15, 2009 | No | 4 |
| Eclair | 2.0 – 2.1 | October 26, 2009 | No | 5 – 7 |
| Froyo | 2.2 – 2.2.3 | May 20, 2010 | No | 8 |
| Gingerbread | 2.3 – 2.3.7 | December 6, 2010 | No | 9 – 10 |
| Honeycomb | 3.0 – 3.2.6 | February 22, 2011 | No | 11 – 13 |
| Ice Cream Sandwich | 4.0 – 4.0.4 | October 18, 2011 | No | 14 – 15 |
| Jelly Bean | 4.1 – 4.3.1 | July 9, 2012 | No | 16 – 18 |
| KitKat | 4.4 – 4.4.4 | October 31, 2013 | No | 19 – 20 |
| Lollipop | 5.0 – 5.1.1 | November 12, 2014 | No | 21 – 22 |
| Marshmallow | 6.0 – 6.0.1 | October 5, 2015 | No | 23 |
| Nougat | 7.0 – 7.1.2 | August 22, 2016 | No | 24 – 25 |
| Oreo | 8.0 – 8.1 | August 21, 2017 | Yes | 26 – 27 |
| Pie | 9 | August 6, 2018 | Yes | 28 |
| Android 10 (Q) | 10 | September 3, 2019 | Yes | 29 |
| Android 11 (R) | 11 | September 8, 2020 | Yes | 30 |

## Forward and Backward Compatibility

Every version of Android includes updates to the API, called **over-the-air** (OTA) updates. These updates are designed such that the features of all previous versions of the API are included, while adding new features on top. **Older features** may be **deprecated**, but are not **removed**, so that applications that work with older versions of the API do not break. An application running on API level 30 is thus fully capable of also running on API level 31. This ability of the Android APIs is called **forward compatibility**.

However, Android APIs are not **backward compatible**. An application designed to run on API level 30 cannot run on API level 29. This is because newer API levels introduce **new features** that the older API levels simply do not have.

## SDK Versions

Based on the above information, each Android application can specify a minimum, target and maximum SDK version.

The **minimum SDK version** specifies the minimum API level required to run the application. By default, this is set to .

The **target SDK version** specifies the API level on which the application is designed to run.

The **maximum SDK version** specifies the API level beyond which the application will not be able to run. Since Android APIs are **forward compatible**, this value is **never used**. If an application has the maximum SDK set to API Level 5 and a device using the application receives an OTA update to API Level 6, the application is removed from the device.

All these details are specified in a **manifest file**.

<uses-sdk android:minSdkVersion="23"  
 android:targetSdkVersion="29"  
 android:maxSdkVersion="29" />

XML

The minimum SDK version should be set to the lowest possible version that the application can support, to support the largest possible number of devices. The target SDK should be set to the highest possible version available, to have access to all the latest features. These can be set in the **application level build.gradle file**.

While testing the application, it should be tested against every API level from the minimum SDK version to the target SDK version.