

Supplemental Readings for Mobile App Management

Check out the following links for more info:

- [Switching apps in iOS](#)
- [How to force an app to close in iOS](#)
- [Find, open & close apps in Android](#)
- [Android processes and application Lifecycle](#)
- [iOS - Battery and performance for iOS](#)
- [Fix battery drain problems for Android](#)

Supplemental Readings for Mobile Device Resetting and Imaging

Check out the following links for more information:

- [Android - Reset your device to factory settings](#)
- [iOS - Restore your device to factory settings](#)
- [Full OTA Images for Nexus and Pixel Devices](#)
- [If your iPhone, iPad, or iPod touch won't turn on or is frozen](#)

Google Play Store

Google Play revenue makes it possible for Google to offer the open Android operating system for free to device manufacturers in order to promote growth and innovation. This business model has driven Android adoption across 24,000+ device models with billions of Android mobile device users around the world.

The Google Play store hosts 2 million apps and games with 140+ billion downloads per year, and growing. Google also keeps consumers safe with Google Play's built-in protections, which require developers to adhere to high safety standards.

To distribute an app publicly through the Google Play Store, a developer will:

1. Create a Google Play developer account.
2. Use the Google Play Console to Create App.
 - a. Provide preliminary information about the app.
 - b. Review and agree to the Developer Program Policies, Terms of Service, and documentation about export laws (where applicable).
3. Use the app's Dashboard for guidance through the app publishing process:
 - a. Google Play Store listing
 - b. Pre-release management
 - c. Prepare a release
 - d. Testing
 - e. Submit app and declarations for review by Google
 - f. Promotion/pre-registration
 - g. Publish app (upon review approval)

Outside official Google distribution channels

Google's open platform policies includes allowing competitors to innovate in developing app stores. Some alternative app stores that distribute Android apps include:

- APKMirror
- Aurora Store
- Aptoide
- Amazon Appstore
- F-Droid
- Uptodown
- SlideMe
- APKPure
- Galaxy Store
- Yalp Store

Please see Fossbytes "[10 Best Google Play Store Alternatives: Websites And Apps](#)" for more information about each Android app store in the list above.

Supplemental Reading for Mobile App Packages

Mobile App Distribution

You are likely familiar with using either the Apple App Store or Google Play store to download and install apps on your smartphone. As an IT Support professional, you may need to deploy mobile apps across large organizations. In this reading, you will learn more about how mobile apps are distributed both publicly and privately for iOS and Android.

How apps are distributed

Apple mobile apps

Apple's App Store provides apps to millions of mobile devices around the world, including the iPhone, iPad, and Apple Watch. Apple's App Store Connect allows developers and organizations to distribute both public and private apps, provided that the app passes an intensive review process to meet Apple's quality standards. App Store Connect also allows developers and organizations to set individualized prices for the apps, enter banking information to accept payments for apps or in-app purchases, schedule beta testing, and more. Apple recommends that developers use the Xcode integrated development environment (IDE) or Ad Hoc for developing iOS, iPadOS, and watchOS apps.

Apple's App Store

Apple's public App Store is a marketplace that reaches millions of Apple mobile device users across the world. The App Store offers developers unlimited bandwidth for hosting, handles payment processing, verifies users, etc. Developers must first register through the Apple Developer Program if they wish to distribute apps through the App Store. The Apple Developer Program offers resources, tools, and support for app development, including testing tools, beta software, analytics, etc. Apple has a long and detailed list of guidelines for all apps that developers and organizations must follow. The guidelines include rules for safety, third-party software development kits (SDKs), ad networks, trademarks and copyrights, and much more. Additionally, submitted apps cannot be copies of other developers' products, nor can they be designed to steal users' data. Though the Apple Store Connect review process is rigorous, the platform also provides an appeals process for rejected apps.

Custom Apple apps

Organizations may opt to create private customized apps to meet specific and unique organizational needs. These custom apps may be designed for the organization's students, employees, clients, partners, franchisees, etc. Organizations can choose to offer the apps for free, for a price, or through special redemption codes. They also have the option to automatically distribute and configure apps to large numbers of registered devices using Mobile Device Management (MDM).

Apple offers a couple of options for private and secure customized app distribution:

- Apple School Manager - For educational institutions, provides the option to distribute proprietary apps for internal use and to purchase other apps in large volumes, often with educator discounts. Common apps in Apple School Manager might include those for course registration or digital textbook access. Apple School Manager also offers educational institutions the ability to create accounts for students and staff, as well as to setup automatic device enrollment.
- Apple Business Manager - For businesses, offers similar features as the Apple School Manager including the distribution and purchase of private apps, as well as the automatic deployment of apps to the business' mobile devices. As an IT Support professional, you might want to volume purchase mobile virus protection and automatically deploy the app across your business' mobile devices. An organization can set private audience groups in App Store Connect. The audience groups will be able to see and download the organization's custom apps through the Apps and Books or Content sections of the Apple School and Apple Business Managers.

Outside official Apple distribution channels

Some developers and organizations might not want to use an Apple platform for app distribution. As an alternative, they have the option to distribute Apple "trusted developer" apps from websites or private file shares using their Apple Developer ID certificate and Apple's notarization process.

Android mobile apps

Google makes considerable investments into Android development, the Google Play platform, services, tools, and marketing to support developers and organizations who choose Google Play to deploy Android apps. Android Studio is the official Android integrated development environment (IDE) for developing Android apps. Android Studio is used to compile Android Package Kit (APK) files, and the Android App Bundle is used to publish apps to Google Play. The Android App Bundle enables Google Play to automatically generate the APK files for a variety of devices and provide app signing keys. This service is a significant time saver for developers and it ensures Google Play apps will work on most Android devices.

Google Play Store

Google Play revenue makes it possible for Google to offer the open Android operating system for free to device manufacturers in order to promote growth and innovation. This business model has driven Android adoption across 24,000+ device models with billions of Android mobile device users around the world. The Google Play store hosts 2 million apps and games with 140+ billion downloads per year, and growing. Google also keeps consumers safe with Google Play's built-in protections, which require developers to adhere to high safety standards.

To distribute an app publicly through the Google Play Store, a developer will:

1. Create a Google Play developer account.
2. Use the Google Play Console to Create App.
 - a. Provide preliminary information about the app.
 - b. Review and agree to the Developer Program Policies, Terms of Service, and documentation about export laws (where applicable).
3. Use the app's Dashboard for guidance through the app publishing process:
 - a. Google Play Store listing
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 - e. Submit app and declarations for review by Google
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 - g. Publish app (upon review approval)

Custom Android Apps

Large organizations, or Enterprise customers, can use "managed Google Play" as a distribution tool for deploying apps to employees. Enterprise customers operate their own Google Play store to host their apps publicly and/or privately. They can grant access to select users or user groups to view and download private apps.

Google Play Custom App Publishing API is an Application Programming Interface from Google that enables developers and organizations to create and publish private custom apps. Apps that are published through Google Play Custom App Publishing API cannot be converted to public apps. The apps will remain private permanently. Google offers a streamlined verification process for private custom apps. These apps can be available to an organization for deployment in as little as 5 minutes after verification.

Google Play Custom App Publishing API can be used by:

- Enterprise mobility management providers (EMMs)
- Third-party app developers
- Organizations/developers that want their enterprise clients to be able to distribute private/custom apps from an EMM console, IDE, or other interface.

Enterprise customers can publish apps by:

1. Enabling the Google Play Custom App Publishing API.
2. Creating a service account.
3. Granting publishing permission to the service account on the organization's Play Console developer account.

Using Google Play within an organization, IT Support administrators should:

1. Use their organization's managed version of Google Play to select and approve apps.
2. Ensure all employee Android devices are set up to use the organization's managed Google Play account.
3. Use the organization's Enterprise Mobility Manager (EMM) to manage employee Android devices and deploy selected apps to employees' Android devices.

For Android devices that are owned by employees (BYODs) and not registered with the organization's EMM:

1. Consider Google's recommendation to create a work profile on each device..
2. Show employees how to use their work profile to access the organization's managed Google Play account.
3. Demonstrate that employees can then view and install any of the administrator selected and approved apps.

Outside official Google distribution channels

Google's open platform policies includes allowing competitors to innovate in developing app stores. Some alternative app stores that distribute Android apps include:

- APKMirror
- Aurora Store
- Aptoide
- Amazon Appstore
- F-Droid
- Uptodown
- SlideMe
- APKPure
- Galaxy Store
- Yalp Store

Please see Fossbytes "[10 Best Google Play Store Alternatives: Websites And Apps](#)" for more information about each Android app store in the list above.

Regarding Developing Apps for Legacy Orgs

- [App Store Review Guidelines](#) - Apple's comprehensive list of guidelines developers must follow for designing and submitting apps to the Apple App Store.
- [Distributing custom apps for business](#) - Apple's guide to publishing custom apps.
- [About Android App Bundles](#) - Android developer's guide to using Android App Bundles to develop and publish apps on Google Play.
- [Get started with custom app publishing](#) - Google's guide to publishing custom apps.

For more information about updating apps on mobile devices, please visit:

- [How to manually update apps on your Apple device](#) - Instructions for configuring both manual updates and automatic updates for apps on Apple mobile devices.
- [Manage software updates for Apple devices](#) - Advanced administrative information for managing software updates for Apple mobile devices. Centered on devices enrolled in mobile device management (MDM) solutions.
- [How to update the Play Store & apps on Android](#) - Provides step-by-step instructions on multiple options for updating Android apps.

Resources for more information

- [App Store Review Guidelines](#) - Apple's comprehensive list of guidelines developers must follow for designing and submitting apps to the Apple App Store.
- [Distributing custom apps for business](#) - Apple's guide to publishing custom apps.
- [About Android App Bundles](#) - Android developer's guide to using Android App Bundles to develop and publish apps on Google Play.
- [Get started with custom app publishing](#) - Google's guide to publishing custom apps.

Supplemental Reading for Updating Mobile Apps

Mobile App Packages: App Updates

In this reading, you will learn about updating apps on mobile devices. IT Support professionals use this skill for the maintenance and troubleshooting of mobile devices. It is a best practice to keep apps updated for security purposes and to avoid any problems that affect outdated apps.

How to update apps

Android mobile apps

It is important to note that Android is an open operating system (OS). This means mobile device manufacturers and cellular service providers can modify the Android OS to enhance, control, or restrict elements of the OS. These modifications can include how system settings are accessed. If an Android device's Storage settings cannot be located easily, it is best to consult the device manufacturer's manual. Mobile device manuals can often be found online.

Instructions for most Android phones and tablets (*note that instructions may vary by OS version; Android 12 was used for these instructions*):

Automatic updates

1. Open the Google Play Store app.
2. At the top right, tap the profile icon.
3. Select Settings.
4. Open the sub-menu for Network preferences.
5. Select an option:
 - a. App download preference Over any network - to update apps using either Wi-Fi or mobile data (data usage charges may apply, depending on cellular plan).
 - b. Auto-update apps Over Wi-Fi only - to update apps only when connected to Wi-Fi.

Troubleshooting note: If the user is not logged in to their Google account on the Android device, apps may not update automatically.

Manual updates

1. If automatic updates are toggled on, repeat steps 1 to 5 for the "Automatic updates" instructions listed above. However, for step 5, select Don't auto-update apps.
2. Open the Google Play Store app.
3. At the top right, tap the profile icon.
4. Select Manage apps & device.
5. In the Update available section, select See details.

Select individual software to Update.

- 6.

Apple mobile devices

Automatic updates

Apple's iPhones and iPads are configured by default to automatically update apps stored on these devices. However, as an IT Support specialist, you may encounter a variety of reasons why automatic updates were disabled for a device, but need to be enabled again. The instructions to turn on automatic updates for installed apps may vary by OS version. Please see Apple's website to view instructions for the specific OS version in use.

Manual updates

Some IT departments have policies to test all updates before allowing the updates to be applied across the organization's devices. In this case, you may need to configure the organization's Apple mobile devices to use manual updates for apps. Turning on manual

updates will involve turning off automatic updates. This step enables notifications to display each time an update becomes available for an app installed on the device.

Instructions for app updates

The instructions for configuring automatic and manual updates for installed apps may vary by OS version. Please see the "Resources for more information" section below for links to Apple's Support website to obtain detailed instructions.

Resources for more information

For more information about updating apps on mobile devices, please visit:

- [How to manually update apps on your Apple device](#) - Instructions for configuring both manual updates and automatic updates for apps on Apple mobile devices.
- [Manage software updates for Apple devices](#) - Advanced administrative information for managing software updates for Apple mobile devices. Centered on devices enrolled in mobile device management (MDM) solutions.
- [How to update the Play Store & apps on Android](#) - Provides step-by-step instructions on multiple options for updating Android apps.

Supplemental Reading for Mobile Device Storage

In this reading, you will learn how to check mobile devices for available storage space and how to free up storage when space is low. Storage space on mobile devices is often limited. It is a best practice to ensure that there is sufficient space on a mobile device before installing new apps or saving new files. As an IT Support Specialist, checking storage space is an important troubleshooting step. Like PCs, mobile devices can experience unusual errors when storage space runs low. Imagine a user is trying to install an app or save a file to a mobile device and an unexpected error occurs. If the error does not generate an informative error message, you will have to investigate the problem. The first troubleshooting step for an installation or saving problem should be to check if there is enough storage space for the new app or file.

Sometimes, limitations may be reached without the user intentionally adding programs or files to their device. Automatically generated temporary cache files, for instance, can fill up the last bit of storage space and cause unusual performance problems. Fortunately, unused or rarely used apps and files can be uninstalled or deleted to make space for new items. Users should also be encouraged to use cloud storage for photos, videos, and other important files, instead of storing the files locally on the mobile device. This not only saves storage space, but it also helps in protecting the files if the mobile device is lost, stolen, or broken.

Apple mobile devices

Both iOS and iPadOS automatically analyze how much space apps occupy in storage on iPhones and iPads. You can see how much storage is available through the device's Settings menu, on iTunes, or through a computer with a connection to the mobile device. Apple mobile devices can be configured to free up space automatically when they are low on storage space. The devices will select files that can be downloaded again if needed for removal. These files can include cache, local copies of files that are stored in the cloud, streamed videos and music, and temporary files. Apple devices should also generate an alert when storage space is almost full to give the user an opportunity to select specific apps and files for removal.

The following steps should be followed to check the storage space available on iPhones and iPads (*note that instructions may vary by OS version; iPadOS 15 was used for these instructions*):

1. Navigate to Settings > General > iPhone Storage or iPad Storage.
2. The first item on the Storage screen should be a visual indicator of how much storage space has been used out of the total storage space available on the device. It might be color coded to delineate which types of items are occupying the used storage space, such as apps, messages, media, system data, etc.
3. Check the RECOMMENDATIONS section near the top of the screen (if available). This section might suggest automatically deleting messages that are over a year old or automatically uninstalling unused apps when space is running low. Be sure to investigate the suggested items for deletion to ensure that the items will not be missed before clicking Enable.
4. Review the next section, which lists the apps installed on the device. The file size and date last used will be listed for each app. If you open the detailed view for an app, you might see options like:
 - a. Offload the app - Removes the app only, but keeps app data and documents.
 - b. Delete the app - Removes the app, its data, and related documents.
5. Select the best option that suits the device user's needs.
6. Move any photos, videos, and other user-created files to iCloud storage and remove the copy stored on the device's storage space.

Android mobile devices

Android is an open operating system (OS), which allows manufacturers to change the OS configuration. These changes can include how system settings are accessed. For example, most versions of Android should have Storage listed immediately under Settings. However, Samsung Android phones have Storage settings listed under either Device Maintenance or Device Care. If an Android device's Storage settings cannot be located easily, it is best to consult the device manufacturer's manual. Mobile device manuals can often be found online.

Instructions for most Android phones and tablets (*note that instructions may vary by OS version; Android 12 was used for these instructions*):

1. Navigate to Settings > Storage
2. The Storage screen may display a visual indicator illustrating how much storage space has been used out of the total storage space available on the device. Like Apple devices, the graphic might be color coded to indicate which types of **USER DATA** are occupying the used storage space, such as images, videos, audio, documents, apps, etc.
3. Click the **CLEAN UP** button under the graphic (if available).

4. A new window should open to show a list of items that Android has analyzed and **RECOMMENDED FOR CLEANUP**. Next to each item may be a button labeled **CLEAN UP**. Scroll down to the bottom of the list to find the **SPECIAL CLEANUPS** section.
 - a. For some items, like Junk Files, clicking the **CLEAN UP** button will automatically remove the files.
 - b. For other items, like Images or Videos, clicking the **CLEAN UP** button will give the user a checklist of specific items to select for removal. Be sure to investigate the suggested items for deletion to ensure that the items will not be missed by the user.