



MASON WHITEPAPER

Mason OS 2 to Mason OS 6 Migration Guide





Our unified platform takes the complexity out of data collection. Focus on what you do best — Mason does the rest.

Hardware, software, operations and logistics, and customer support. We simplify processes, open doors to possibility, and save you money over time.

Mason OS 2 to Mason OS 6 Migration Guide

As Mason's fleet of devices continues to transition to newer versions of Android, some of our customers will be moving from Mason OS 2 (Android 7-based) to Mason OS 6 (Android 11-based) or later. This white paper covers common pitfalls and important considerations with this transition. In addition, this [document](#) from the official Android website has general tips for porting to Android 11.

Why upgrade?

MasonOS 2, originally shipped in 2019, was based on Android 7 which was released by Google in 2016. Google supports major releases of Android for a fixed period of time, and Google deprecated official support for Android 7 in 2021. As a result, Android 7 is no longer maintained by Google (or chipset vendors) and thus does not receive bug fixes or security updates.

New versions of Android and MasonOS have since added new features, improvements, and bug fixes, and thus migrating to a newer version of MasonOS is worth considering. Some reasons to consider upgrading include:

Enhanced security	via an improved storage encryption, stronger biometric authentication, and the Direct Boot API, which helps apps manage their encrypted storage.
Higher performance	by improvements in the newer Linux kernel and the overall Android platform.
Increased battery life	due to efficient background process management, and app standby to reduce application activity when in the background.
Dark mode and theme overlays	are supported and can be configured for all applications system wide.
Enhanced privacy	through features such as scoped storage and improved application-level permissions. See the documentation on how this has changed in Android 11 and whether your application is affected.
<u>Improved notification system</u>	allows developers to group notifications into conversations and create quick-access bubbles for a streamlined user experience.
<u>Data access auditing</u>	helps developers improve the security of their application.
X-Ray 2.0 remote management	is fully integrated with Mason Controller and offers remote desktop access and advanced debugging capabilities to any enabled device in a Mason fleet.
<u>Additional Mason configurations</u>	support and tweak more use cases and enhancements added in Android 11. Easily auto-grant application permissions and control doze mode so your app is never paused by the OS. All the options that are available can be found in the configuration glossary for your device.

Common issues

As you migrate your app from Mason OS 2 to Mason OS 6, you may run into some common pitfalls. We've described many of the larger ones below, along with their symptoms and mitigations.

Privacy enhancements

Android 11 has enhanced privacy settings that may affect app development. For example, end users can now provide single-use permissions for sensitive features like camera or location. As a result, your app may need to request permission each time it accesses such features, interrupting the user experience.

Symptom: Your app repeatedly requests permissions each time it is launched.

Mitigation: Grant specific (or all) permissions for any application on the device by adding `default_runtime_permissions_grant_policy` to your `project.yml`

Scoped storage

Android 11 enforces scoped storage, which prevents applications from accessing data outside of their specified directories and media files.

Symptom: Your app attempts to access files on the public SDCARD of a device, resulting in a crash and the following exception: “open failed: EACCES (Permission denied)”.

Mitigation: Update your app to follow Android's best practices for [file access](#). Keep application data within your application sandbox, and use the media content resolver to access media, like photos or videos, from a common source.

Alternatively, if your application use case cannot follow these standards, you can add the permission `MANAGE_EXTERNAL_STORAGE` to your application manifest.

Package visibility

Android 11 provides additional privacy by limiting what apps can learn about other installed apps on the device.

Symptom: Your application can no longer use `queryIntentActivities` to enumerate the list of installed applications

Mitigation: If your app depends on knowledge of other apps installed on the device, make sure to declare this in your app's manifest with the proper visibility configuration. See [this article](#) for code and examples.

Changes in background services

To preserve battery life, Android 11 introduced restrictions on running jobs and receiving broadcasts in the background.

Symptom: A service started by your application stops when the application goes into the background.

Mitigation: Follow the new process introduced in Android 8, which requires that a notification is displayed while background services are running. See the [Background Execution Limits](#) document for more information.

MasonOS tools

- Be sure to upgrade your Mason command line utility to the latest version by following our [guide](#).
- To take advantage of the latest features available on MasonOS 6, upgrade to the latest version of our [SDK](#) in your application.

Need additional help?

These are just some of the topics that may come up as you migrate your application from Android 7 to Android 11. With any new release of Android, it's important to understand the new features and behaviors which may affect your app. For more information on application compatibility and how to target specific Android versions, see [App compatibility in Android](#).

If you have additional questions, please reach out to support@bymason.com.