



Over-the-air (OTA) software updater for embedded devices

Why Use Mender?

1. Save valuable development time and cost
2. Fully open source with no vendor lock-in
3. High standards in software quality and reliability
4. Community-backed
5. Easy to integrate, manage and deploy
6. Complete set of tools, documentation and technical support

Overview

The growing connectivity of embedded systems is causing justified apprehension in bringing new devices online. Many malicious attackers specifically scan for recently published security vulnerabilities with the intent of seeking outdated and vulnerable systems. Malware - such as Mirai, Hajime, BrickerBot, and Reaper - have successfully targeted insecure embedded systems. The number of compromised devices is in the millions and growing.

Research shows the probability of a vulnerability being exploited reaches over 90%. If the vulnerability is remediated within 5-10 days after discovery, that number drops to under 10%.

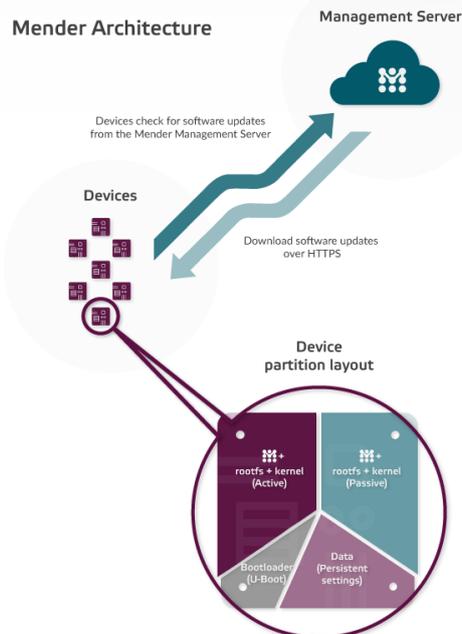
Building a homegrown updater seems easy at first glance, but many custom updaters are built without security in mind. They also lack a robust update process where the devices are at risk of bricking if there is power failure or poor network connectivity. Reallocating development time and effort to other core product metrics will ensure better end-to-end product success.

Solution

Mender is an open source client-server solution to deploy OTA software updates. It allows full control and customizability over how a software is installed and updated. Mender is unique for providing robust and secure system and application updates and it is this combination that enables Mender to solve all OTA needs.

Targeted application-level updates, which can be just a few kilobytes in size (compared to potentially hundreds of megabytes for system-level updates), enables much lower bandwidth usage, faster updates, and more frequent deployments.

There are three options to run Mender: open source on-premise, Mender Enterprise where you can manage your own server with customized updates, or Hosted Mender where we host the server for you, or in standalone mode with only the Mender client when you do not have sufficient network connectivity.



Features

- Out-of-the-box support for updates such as applications, packages, containers, files, and proxy deployment of attached peripherals
- Full control and customization of installing any software
- Application updates on Debian, Ubuntu and Raspbian OSes.
- Dual A/B root filesystem updates with rootfs compression to save bandwidth
- Scripting support for custom actions (e.g. checks after the update is installed)
- eMMC, SD card, and raw NAND/NOR flash support
- One mechanism to update both your applications and kernel
- Device groupings for controlled rollouts

Security and Robustness

- Secure TLS client/server communication
- Ensured software integrity. End-to-end signing and verification of image artifacts for authenticity and integrity
- Full image atomic updates, avoiding unmanageability of a package-based complications from partial updates
- Robust and failsafe support with a dual A/B partition setup if an update fails for any reason
- Brick-free updates with atomic rollback to avoid corruption

Operating System & Board Support

Mender currently supports Linux-based embedded devices with fast growing number of boards and operating systems. [Mender Hub](#) is the only online open source community dedicated to enable OTA software updates on any hardware platform and operating system. Our goal is to enable OTA updates with Mender on every board and operating system.

Mender's experienced professional services team provides consulting for projects big and small, specializing in the rapid implementation of OTA solutions. Mender also provides consulting for more generic embedded devices, including system design architecture and recommendations. With Mender you are covered! [Contact us](#) today.

