



# Software Management & SOTA

October 22nd/11-12:30 | Intended Audience

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## **SOTA / SCOTA / FOTA / OTA**

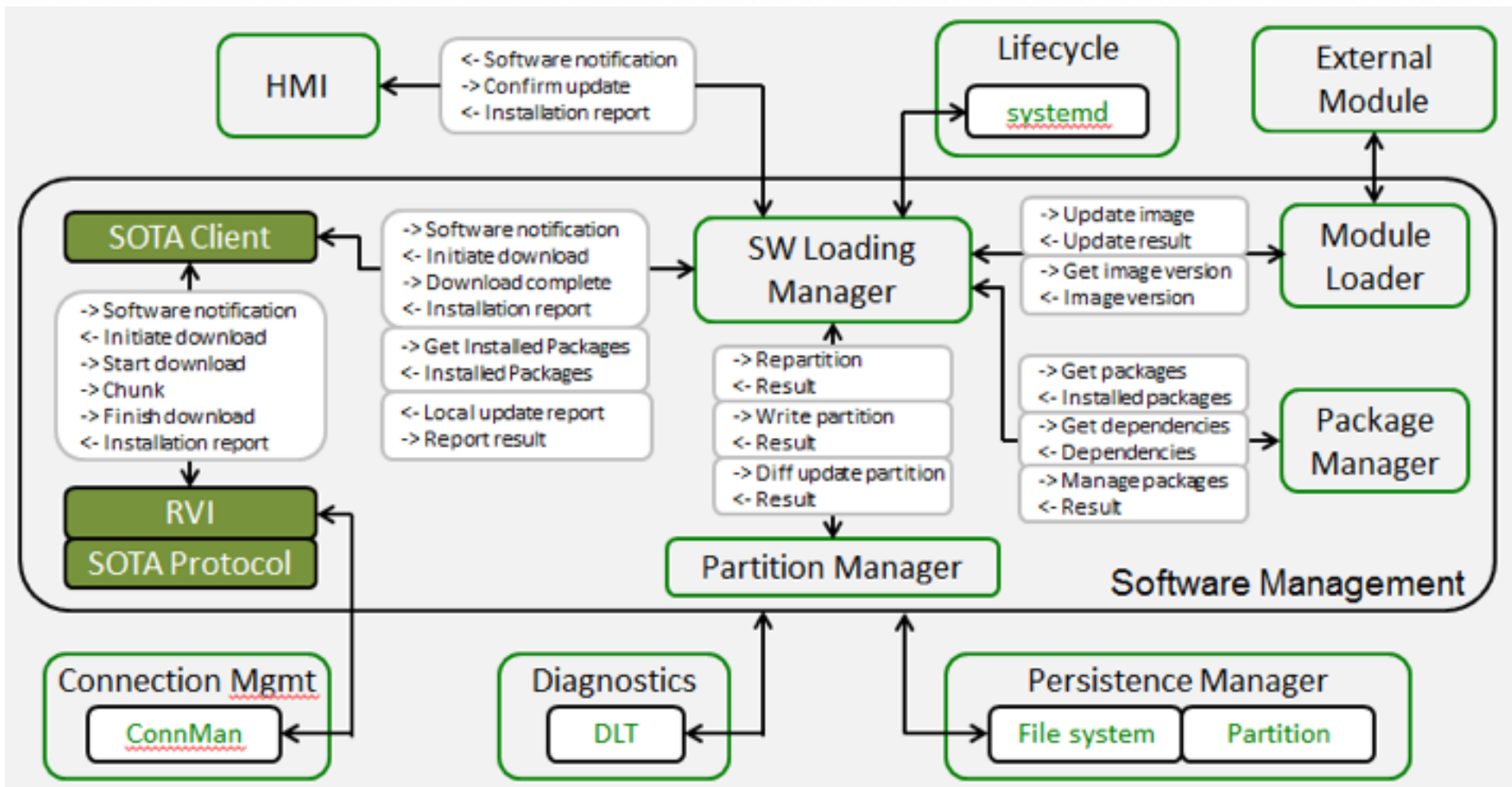
- Delivering updates to vehicles in the field, over the internet
- Urgent requirement for existing and future IVI systems
- Non-differentiating feature - has to work

## **Existing solutions**

- Red Bend (Harman) - feature-rich, fully proprietary
- CarSync (Arynga) - Part of Arynga's proprietary server-side software suite, open source client
- OMA DM / FUMO - Open Standard - complex, some parts available as open source
- The Update Framework [1] - designed to overlay on existing solutions
- "Roll your own" - time consuming, insecure
- JLR commissioned end-to-end open source solution

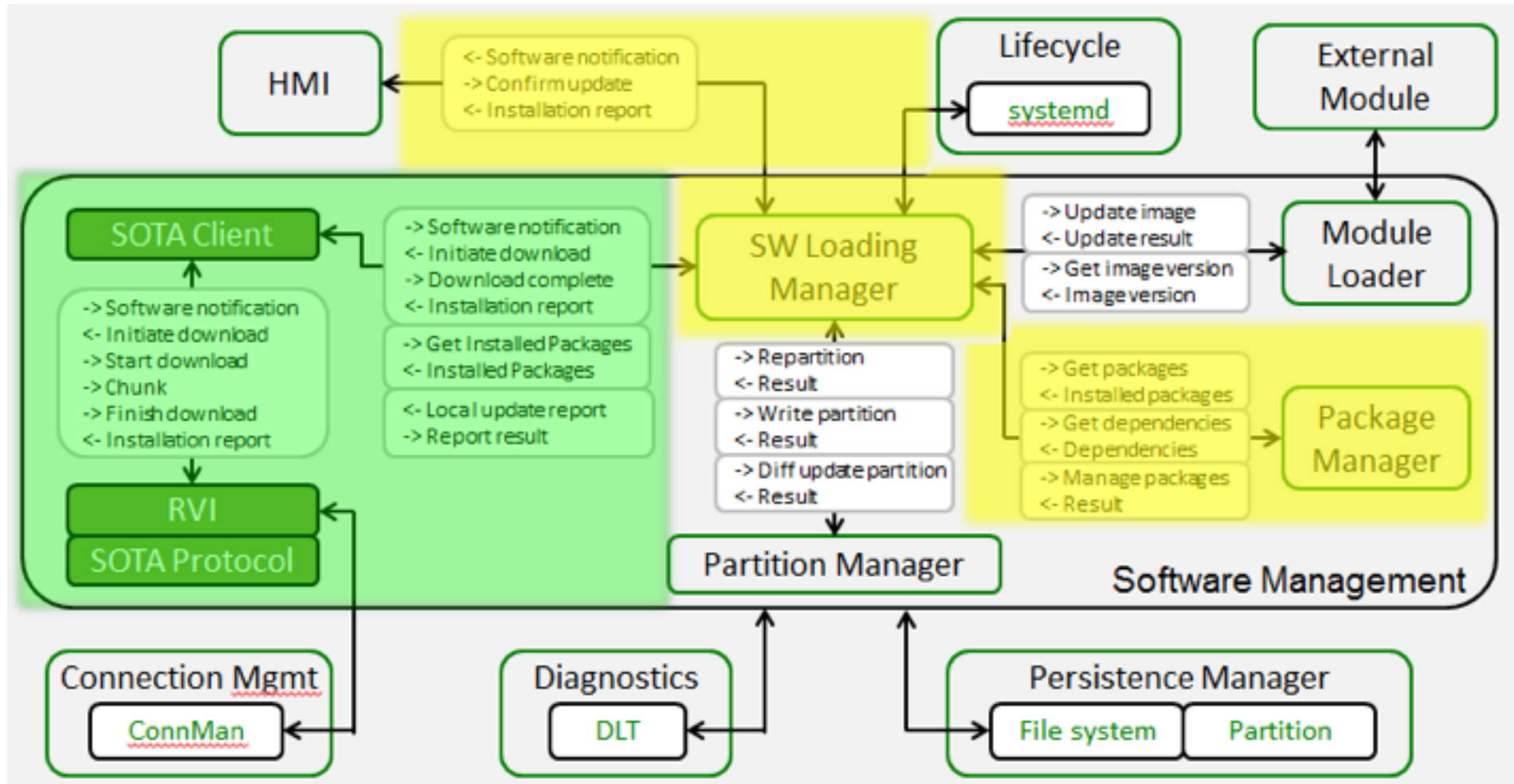
1. <http://theupdateframework.com>

# SOTA - PROJECT BACKGROUND

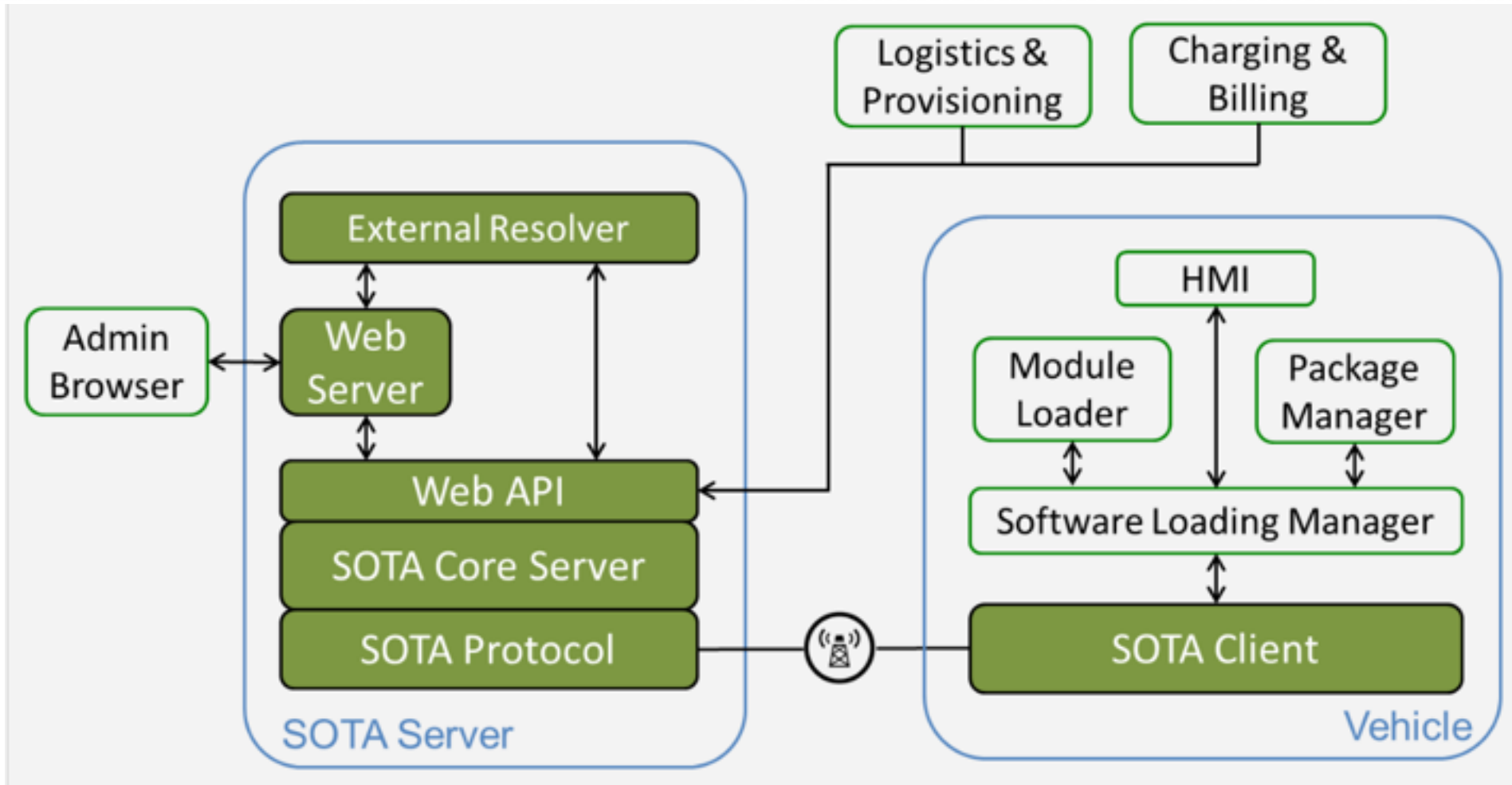




# SOTA - PROJECT BACKGROUND



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# SOTA - FEATURES

- Package upload
- Software / Firmware / Hardware inventory management by VIN
- Package installation campaign management
  - Filtering
  - Scheduling
  - Tracking
- Package download and installation
  - Reliable delivery by RVI
  - Interface with Software Loading Manager / local package manager
  - Success / Failure reporting to the server

# RVI FEATURES

- Secure provisioning of devices
- Mutual client-server authentication and authorization
- Encrypted communication channel
  - End-to-End TLS on all media
- Physical-layer agnostic
  - WiFi / Bluetooth / GSM
- Topology agnostic
  - Client-server, Peer-to-peer
- Scalable, Robust

# SOTA - ROADMAP

- **FIRST** - Initial skeleton system - Done! (20/9)
- **INST** - Tracking package installation - Done! (21/10)
- **COMP** - Managing components - Done! (21/10)
- **DEPS** - Tracking / calculating dependencies
- **SCHED** - Scheduling updates, time boxing, prioritization, queuing
- **SHAPE** - Traffic shaping, data-plan / billing cycle sensitivity
- **SCALE** - Support for high-capacity production deployment



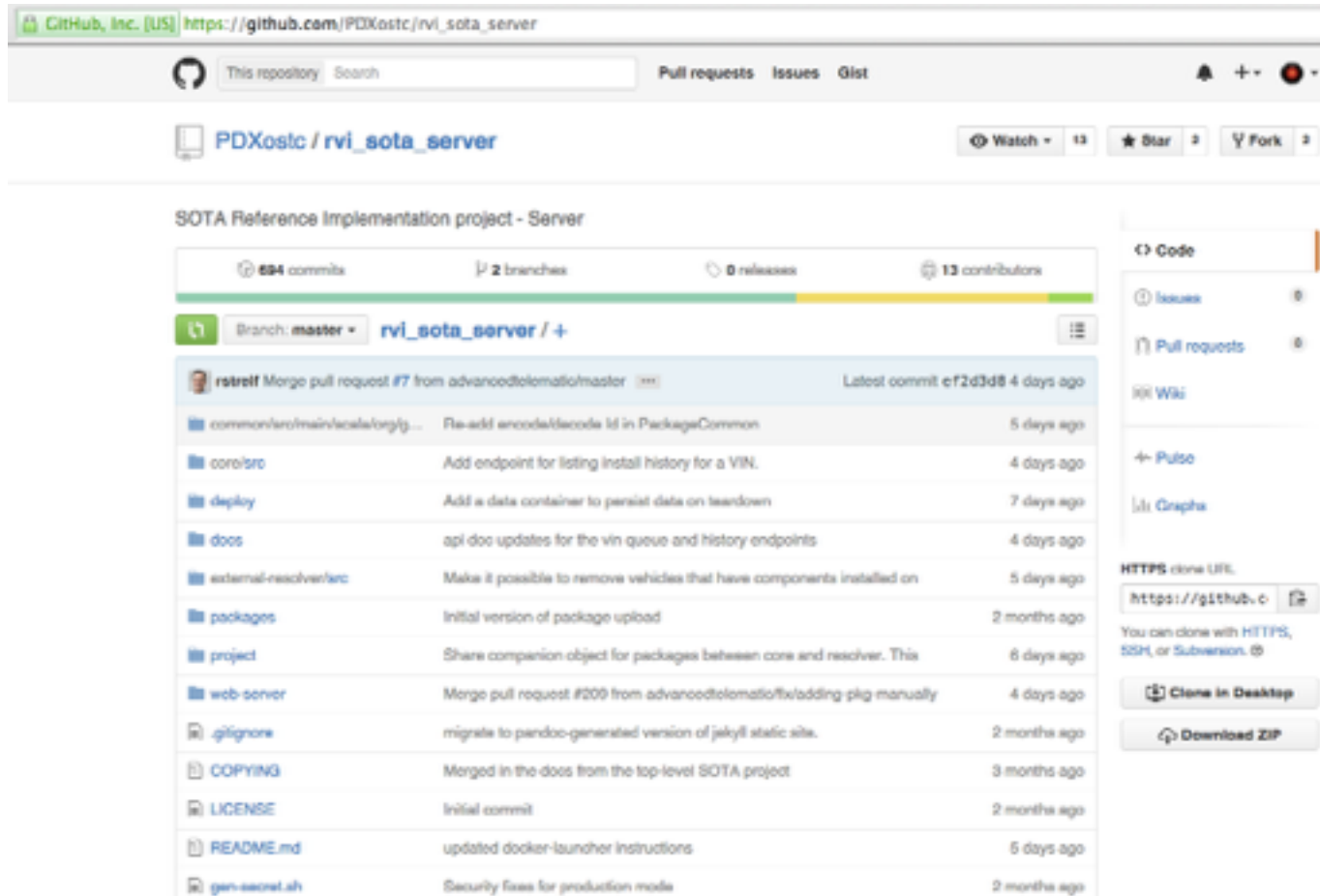
# SOTA - FUTURE PLANS

- Complete logging and audit
  - Reporting / analysis GUI
  - Interactive log viewer - device and server logs
  - ELK / Fluentd integration
- Flexible permissions management
  - Multiple roles, Admin and API user management
- Automatic package manifest -> dependency graph processing
- Download optimization - binary diffs
- Client integration for non-GENIVI platforms
  - Generic Linux
  - QNX? Android?
- Support for non-automotive platforms
  - IoT? CE? Mobile?

# SOTA - DELIVERABLES

- **Server-side**
  - Server implemented in Scala
  - Deployment scripts / instructions for AWS, Docker and developer machines
  - Complete Design, Architectural and API documentation
  - Complete test suite
- **Client-side**
  - Client implemented in Rust
  - Build / installation scripts for GDP
  - Complete test suite
  - Integration with GENIVI Software Loading Manager

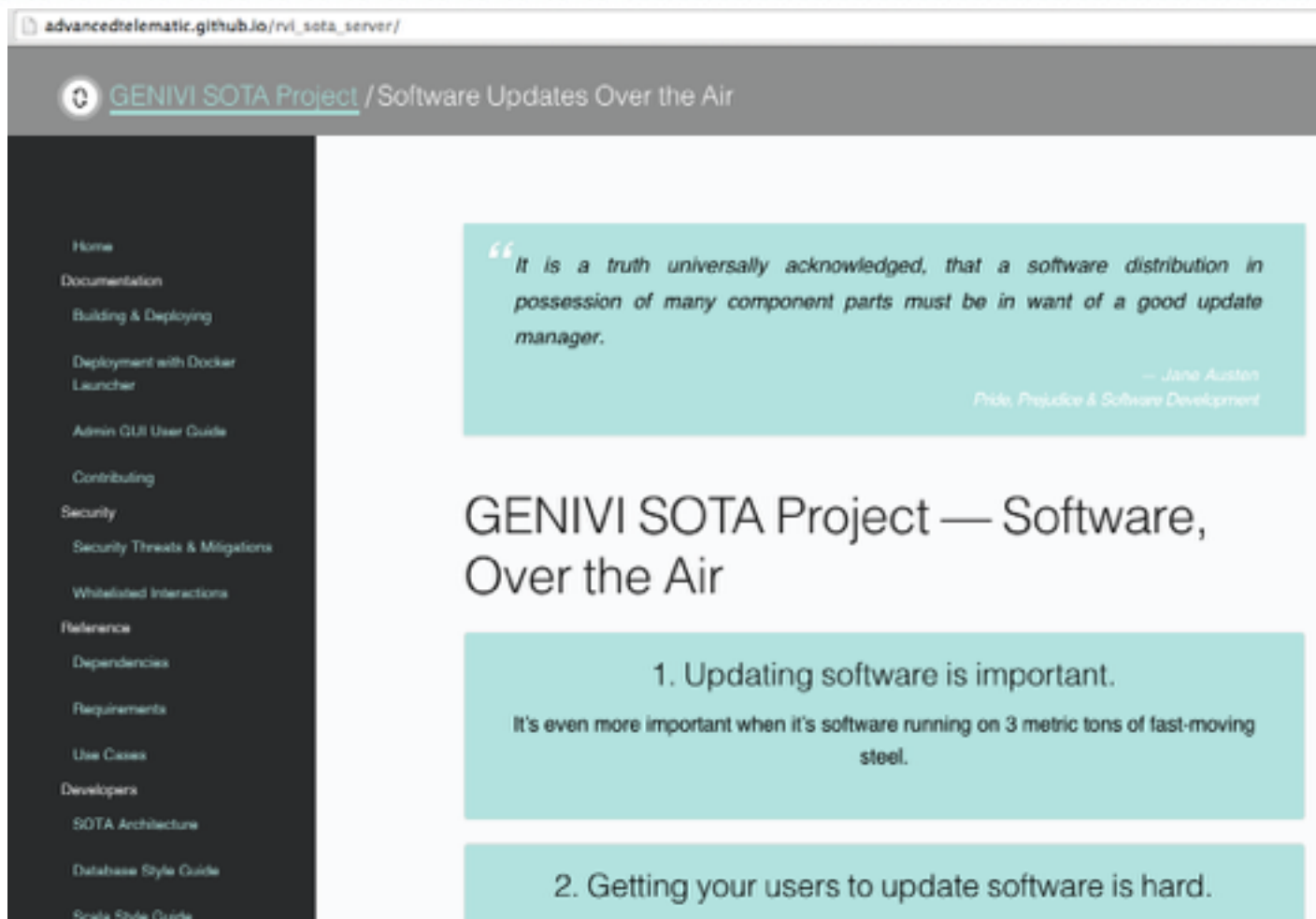
# OPEN SOURCE!



The screenshot shows the GitHub repository page for PDXostc / rvi\_sota\_server. The repository is titled "SOTA Reference Implementation project - Server" and has 584 commits, 2 branches, 0 releases, and 13 contributors. The main branch is master. The repository contains several directories and files, including common/src/main/scala/org/..., coro/src, deploy, docs, external-resolver/src, packages, project, web-server, .gitignore, COPYING, LICENSE, README.md, and gen-secret.sh. The repository is licensed under MPL v.2!

All software  
available  
under MPL v.2!

# OPEN SOURCE!



The screenshot shows the website for the GENIVI SOTA Project. The browser address bar displays `advancedtelematic.github.io/rvi_sota_server/`. The page title is "GENIVI SOTA Project / Software Updates Over the Air". A dark sidebar on the left contains a navigation menu with the following items: Home, Documentation, Building & Deploying, Deployment with Docker Launcher, Admin GUI User Guide, Contributing, Security, Security Threats & Mitigations, Whitelisted Interactions, Reference, Dependencies, Requirements, Use Cases, Developers, SOTA Architecture, Database Style Guide, and Scala Style Guide. The main content area features a quote in a light blue box: "It is a truth universally acknowledged, that a software distribution in possession of many component parts must be in want of a good update manager." attributed to Jane Austen's *Pride, Prejudice & Software Development*. Below the quote is the heading "GENIVI SOTA Project — Software, Over the Air". Two more light blue boxes contain the following text: "1. Updating software is important. It's even more important when it's software running on 3 metric tons of fast-moving steel." and "2. Getting your users to update software is hard."



# LIVE DEMO!



# GET INVOLVED!

Github

[https://github.com/pdxostc/rvi\\_sota\\_server](https://github.com/pdxostc/rvi_sota_server)

[https://github.com/pdxostc/rvi\\_sota\\_client](https://github.com/pdxostc/rvi_sota_client)

JIRA -

Mailing lists -

# SOFTWARE MANAGEMENT

