



HACKATHON

Chapter III - 2025





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PITCHING SESSION *MEGABOSSES*



MegaBosses

Team



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Software
Engineering



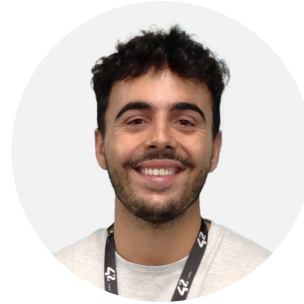
Luís Carvalho

Software
Engineering



Melanie Reis

UX/UI Design,
Front-end
Development



Rui Pires

Software
Engineering



Teresa Chow

Project Coordination
& Communication

Challenge

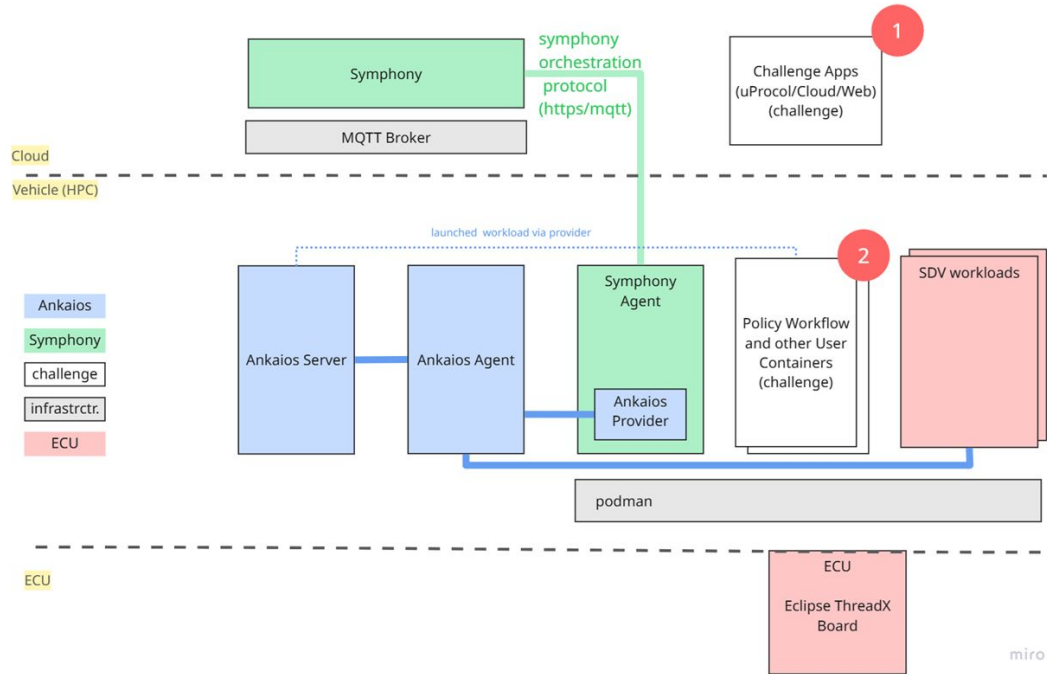
Mission: Update Possible Challenge – OTA updates

Design an open, end-to-end
OTA system

Push updates from cloud to car

Handle rollbacks

Meet real-world security standards
and regulations (UN R155/R156)



Defining the problem

Mission: Update Possible Challenge – OTA updates

Modern vehicles are now sophisticated computers on wheels, with dozens of electronic control units (ECUs) managing safety, performance, and infotainment.

Ford alone faced **over 100 recalls** in 2025, driven largely by software issues.

OTA updates are transformational enabling automakers to manage this complexity **efficiently** and **cost-effectively**.

source: Motor1 (<https://www.motor1.com/news/767943/every-ford-recall-2025/>)

Proposing a solution

Mission: Update Possible Challenge – OTA updates

OTA updates deliver software improvements remotely, eliminating the need for dealership visits. Uses include:

- bug fixes
- security patches
- feature enhancements
- regulatory compliance updates

Updates can be applied to **individual vehicles** or **entire fleets simultaneously**, saving time and operational costs.

source: Fox Business (<https://www.foxbusiness.com/lifestyle/ford-recalls-200000-vehicles-software-glitch-due-crash-risk>)

Proposing a solution

FleetSync – OTA updates



Policy Workflow integrated in a **OTA system**

Interface – Web App

- managing releases
- monitoring update status
- maintaining an auditable process

Use Cases

- Basic OTA Update Orchestration
- Multi-Site OTA Distribution
- Partial Update & Rollback

Approach: Development process

Team responsibilities, Comm. & Decision-making, Planning & tracking, QA

Team responsibilities

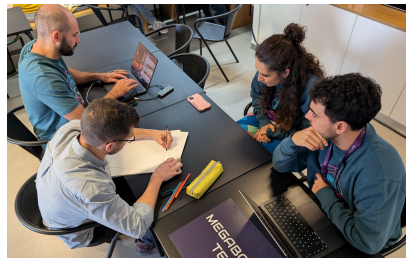
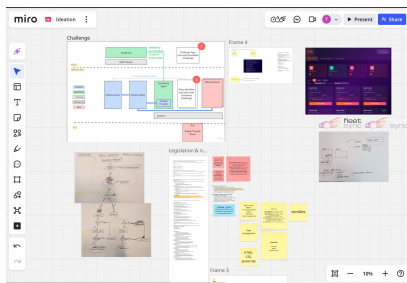
Project Coordination

OTA Update
System
+ Policy
Workflow



WebApp

Communication & Decision-making



collaborative research
and ideation Miro board,
discussion and
agreement on the way
forward

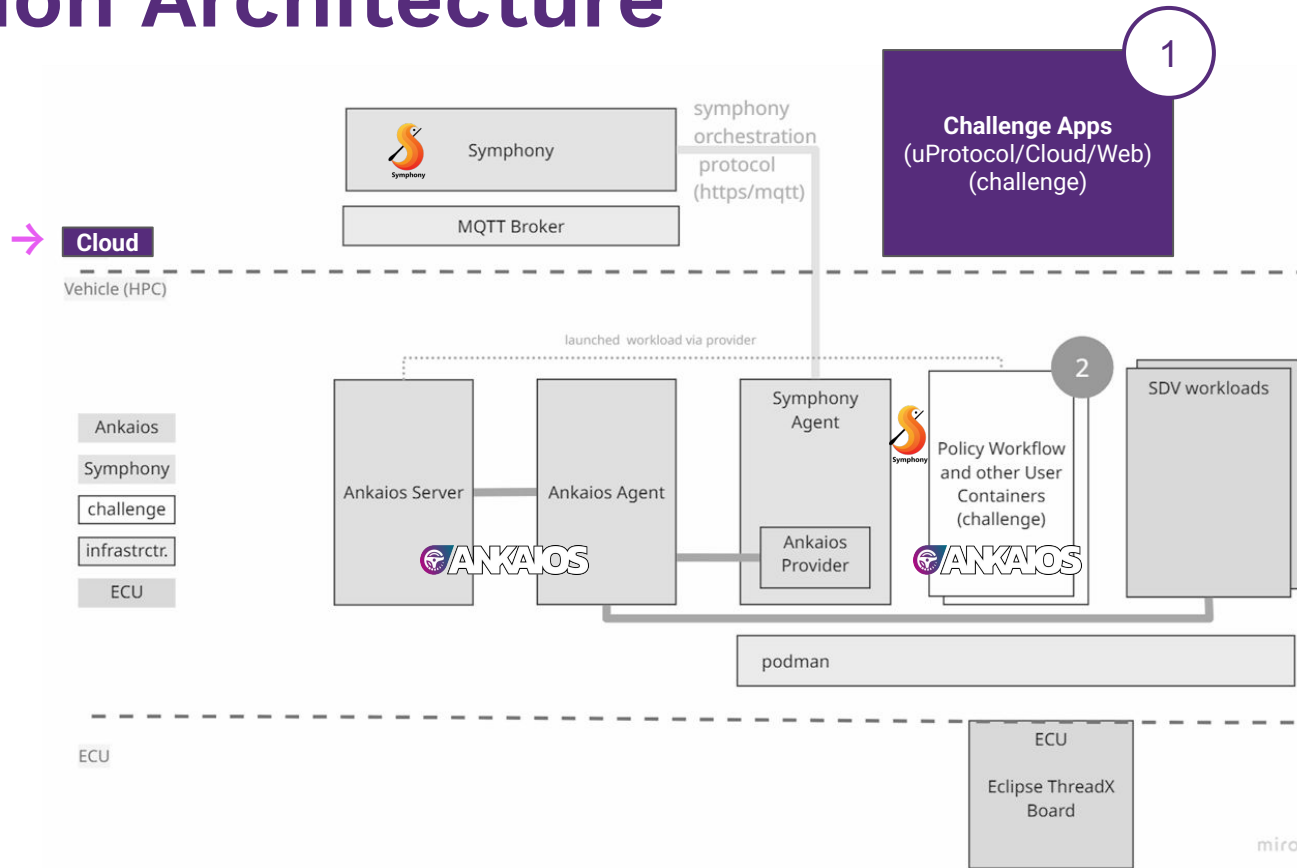
Planning & Tracking, Quality Assurance



version control, branches, code reviews (PRs)

→ planned on using GitHub projects but resorted
to do in-person alignment meetings

Solution Architecture



Challenge

① Web App

NOTE:

Updates must meet certain criteria
prior to being added to the Web
App catalogue:

- ✓ digitally signed by OEM
- ✓ ensure dependency resolution
- ✓ ensure version compatibility
- ✓ meet the defined requirements
for the update
- ✓ ...

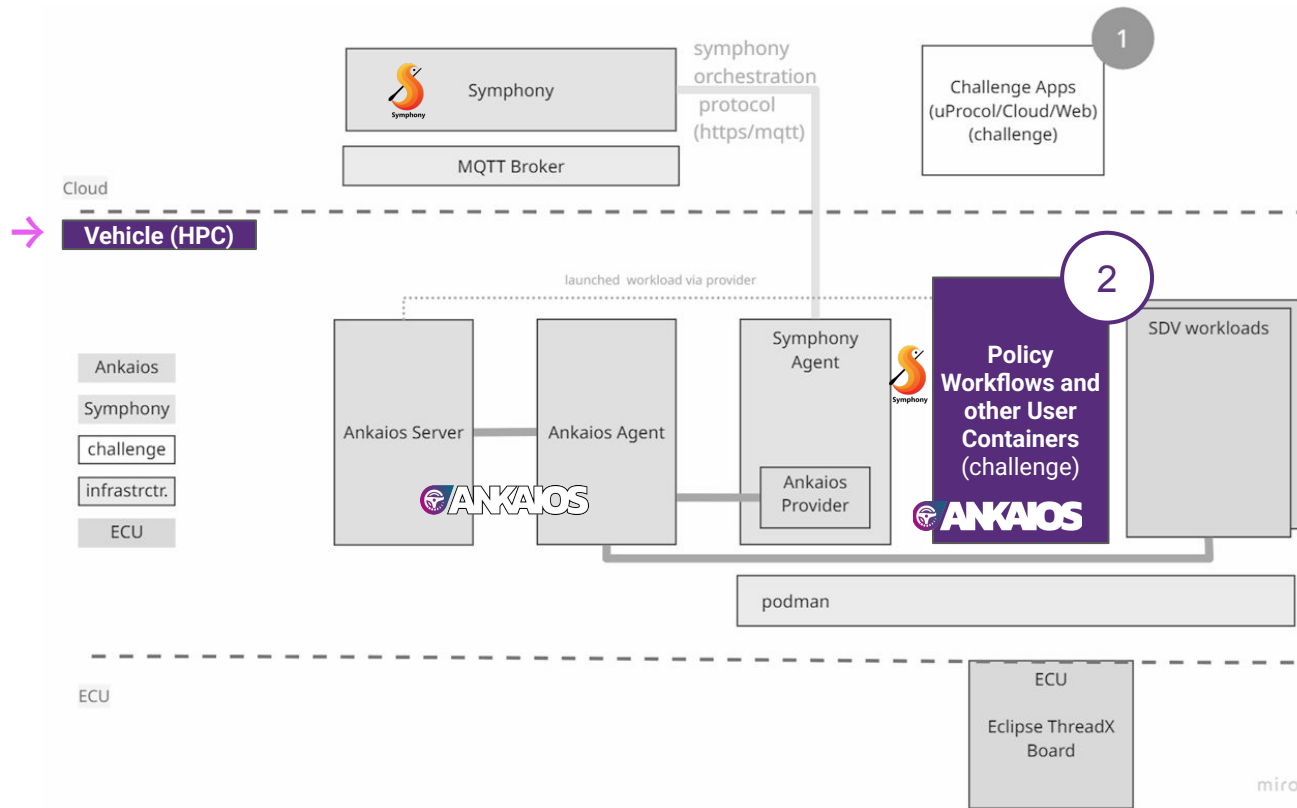
Filter and define fleet to update:

- by app
- by app version
- by location



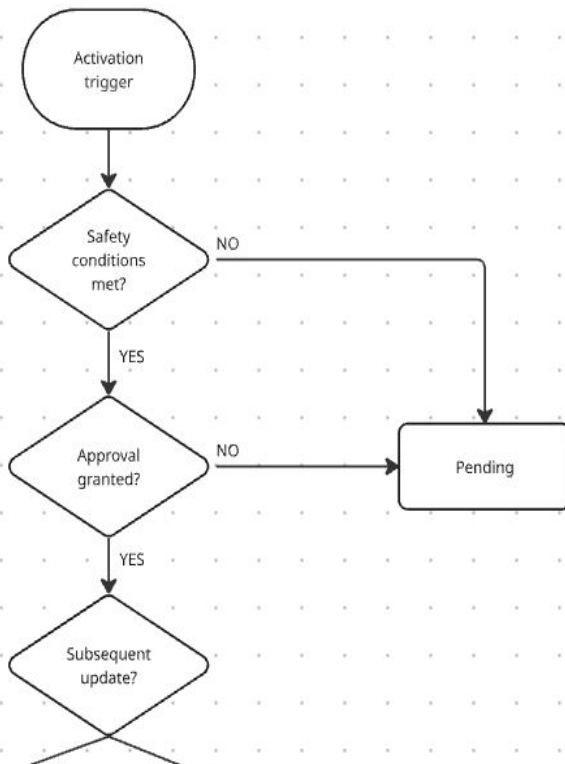
ACTIVATION TRIGGER

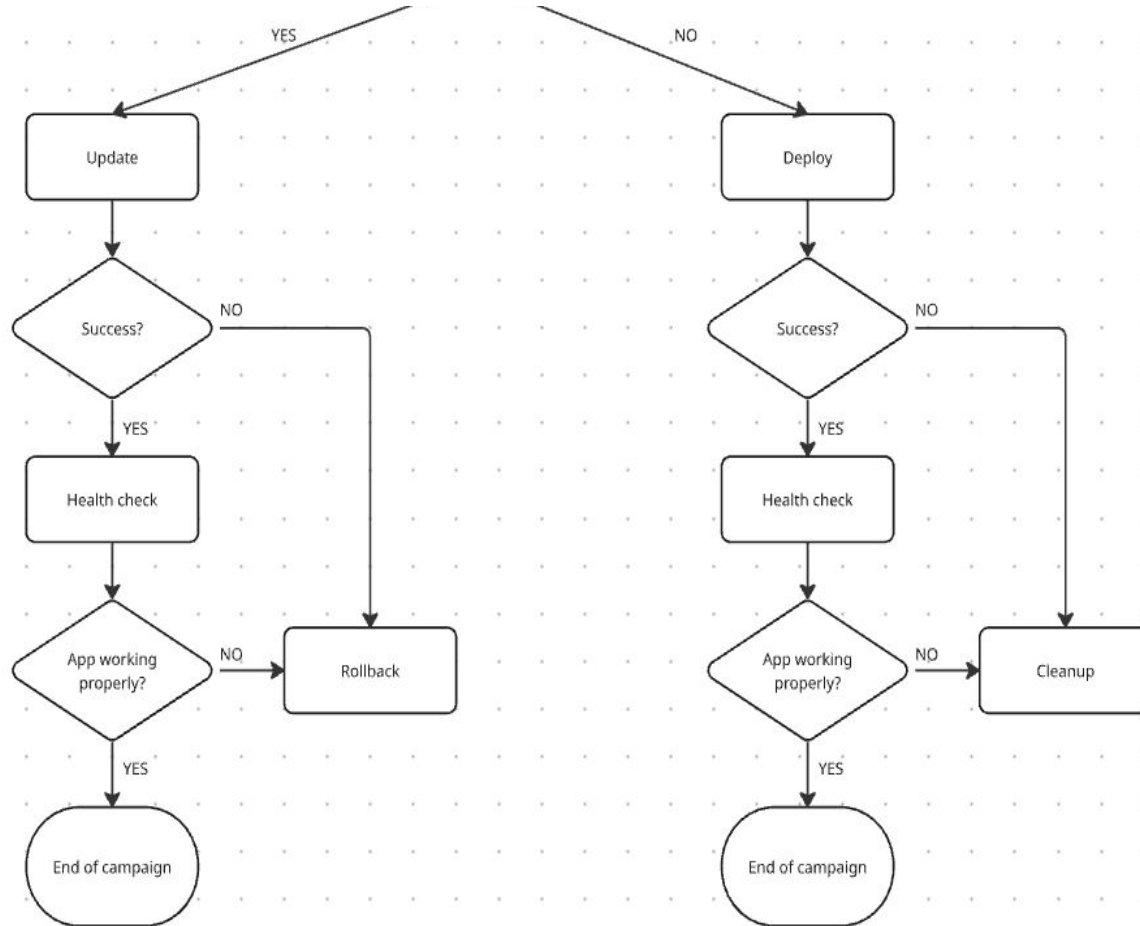
Solution Architecture



Challenge

② Policy Workflow – Symphony Campaign





fleet

Compliance
UN, R137, R150

Some vehicles may be blocked by active policies. Check Fleet Overview for details.

Emergency Braking

Emergency Braking

High

Action

In Progress

Improved pedestrian detection system

Version

v1.0.4

Package Size

32 MB

Deadline

2025-10-30

UN R137-ALKS

Progress

0 / 4 vehicles

4 vehicle(s) pending

Some vehicles may be blocked by active policies. Check Fleet Overview for details.

Hydraulic Efficiency Update

Hydraulic Efficiency Update

Medium

Scheduled

In Progress

Euro 6 compliance optimization

Version

v8.2.2-euro6

Package Size

41 MB

Euro 6

Progress

1 / 5 vehicles

4 vehicle(s) pending

Some vehicles may be blocked by active policies. Check Fleet Overview for details.

Instrument Cluster Application

Instrument Cluster Application

Medium

Scheduled

Trigger Campaign

Fuel efficiency improvements

Version

v5.0.3

Package Size

52 MB

Deadline

2025-11-30

Euro 6

Progress

0 / 5 vehicles

5 vehicle(s) pending

Some vehicles may be blocked by active policies. Check Fleet Overview for details.

localhost:9080

Trigger Campaign: Instrument Cluster Application

Component: Instrument Cluster

Version: v5.0.3

This will update 2 eligible vehicle(s):

• FL-PT-4705


• FL-PT-4706

Proceed?

Cancel

OK




 Instrument Cluster

Speed: 72 km/h

Fuel: 58%

No Warnings



 Instrument Cluster v2

Speed

98

km/h

Fuel


34

%

RPM

3200

rpm


 Low Fuel! Please refuel soon.

All systems: OK

Future steps

Room to grow

mock → real implementation

 **GUARANTEE ENFORCEMENT**
prior to being added to the Web
App catalogue:

- ✓ digitally signed by OEM
- ✓ ensure dependency resolution
- ✓ ensure version compatibility
- ✓ meet the defined requirements for the update
- ✓ ...

MANAGEMENT PLATFORM

- real data usage
- infrastructure definition

POLICY WORKFLOW

- rollback
- true state knowledge
- guarantee workloads' health state

source: EU Cyber Resilience Act (<https://digital-strategy.ec.europa.eu/en/policies/cyber-resilience-act>)

Benefits & Impact

- improve operational efficiency
- ensure compliance with the new Cyber Resilience Act
- streamlining Over The Air (OTA) updates across industries

*“ The Cyber Resilience Act entered into force on 10 December 2024.
The main obligations introduced by the Act will apply from 11 December 2027. ”*

Open-source software development

source: EU Cyber Resilience Act (<https://digital-strategy.ec.europa.eu/en/policies/cyber-resilience-act>)



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THANK YOU

We'd love to hear your thoughts - let's connect!

