

# An Introduction to Eclipse Kuksa

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# Eclipse Kuksa

## Agenda

- ▶ The Projects APPSTACLE and Eclipse Kuksa
- ▶ Technical details
  - ▶ Kuksa Cloud Platform
  - ▶ Kuksa In-Vehicle Platform
  - ▶ Kuksa Integrated Development Environment (IDE)
- ▶ Potential Deployment Scenarios
- ▶ Summary and Outlook



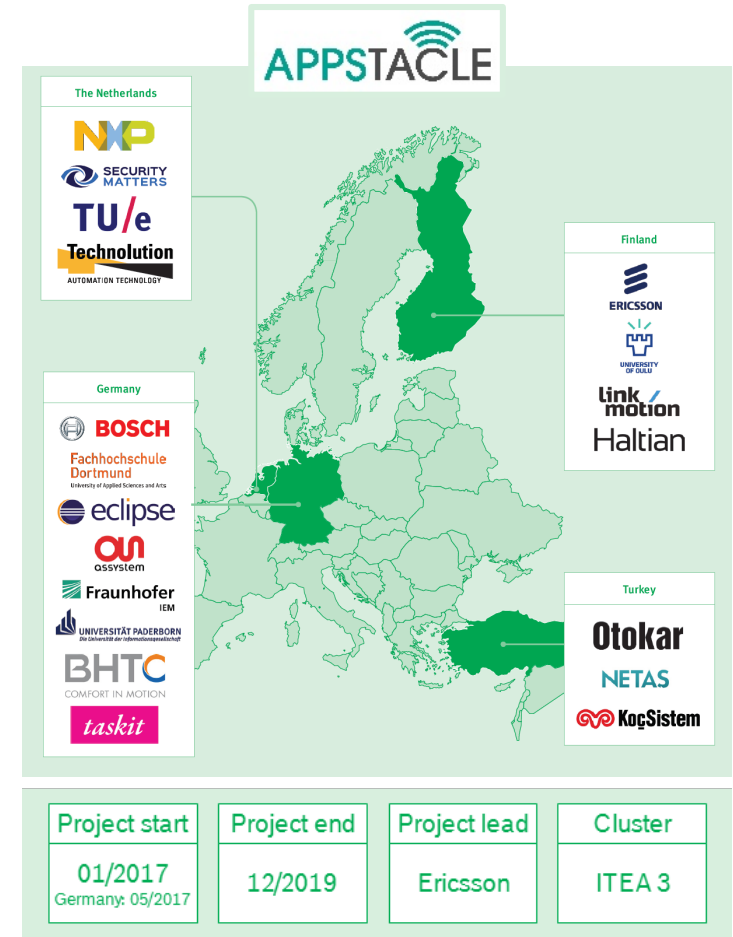
# KUKSA

# The Projects APPSTACLE and Eclipse Kuksa

# Kuksa heritage

## Publicly funded project APPSTACLE

- ▶ **APPSTACLE:** open standard Application Platform for carS and TrAnsportation vehicles
- ▶ **Eclipse Kuksa:** the Open Source project hosting all code developed
- ▶ **Objective:** Development of an **Open Source** Connected Car Ecosystem
  - ▶ Development of an open source automotive IoT Cloud Platform
    - Architectural considerations for the cloud platform
    - Establishment of standardized interfaces to the vehicle
  - ▶ Definition and development of Service enablers for car-to-cloud connectivity
    - Network infrastructure considerations
    - Next generation mobile networks
  - ▶ Development of an open source in-vehicle platform
    - Safe and secure gateway to the cloud
    - In-vehicle data access mechanism and application platform



# Eclipse Kuksa

## Providing a solid foundation

Providing a solid technical foundation routed in Open Standards and proven software will benefit everybody



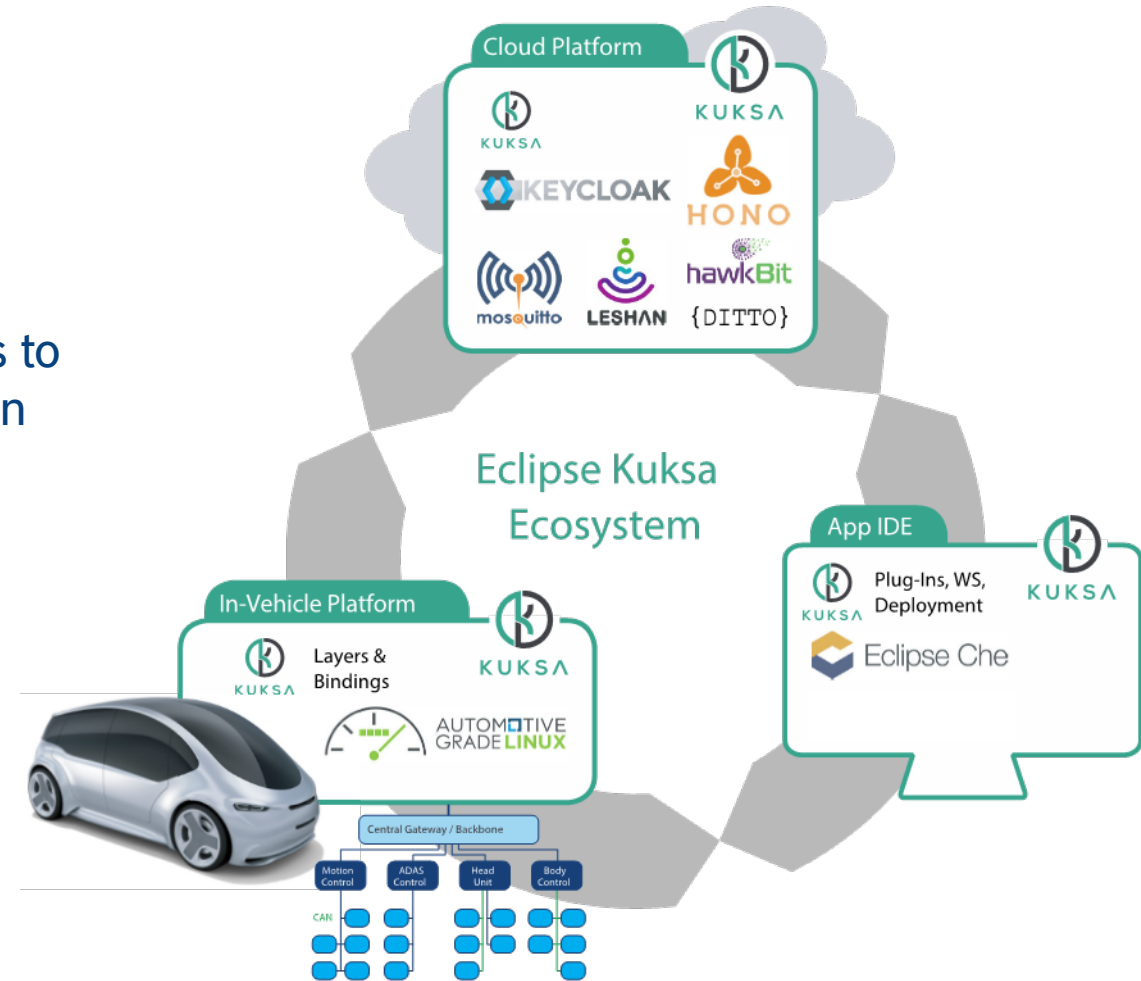
Create a ***cross-vendor*** connected vehicle platform that relies on ***open standards*** and uses ***open source software*** to leverage the potential of a ***large developer community!***

# Eclipse Kuksa

## The Kuksa Ecosystem

Eclipse Kuksa is not trying to reinvent the wheel,

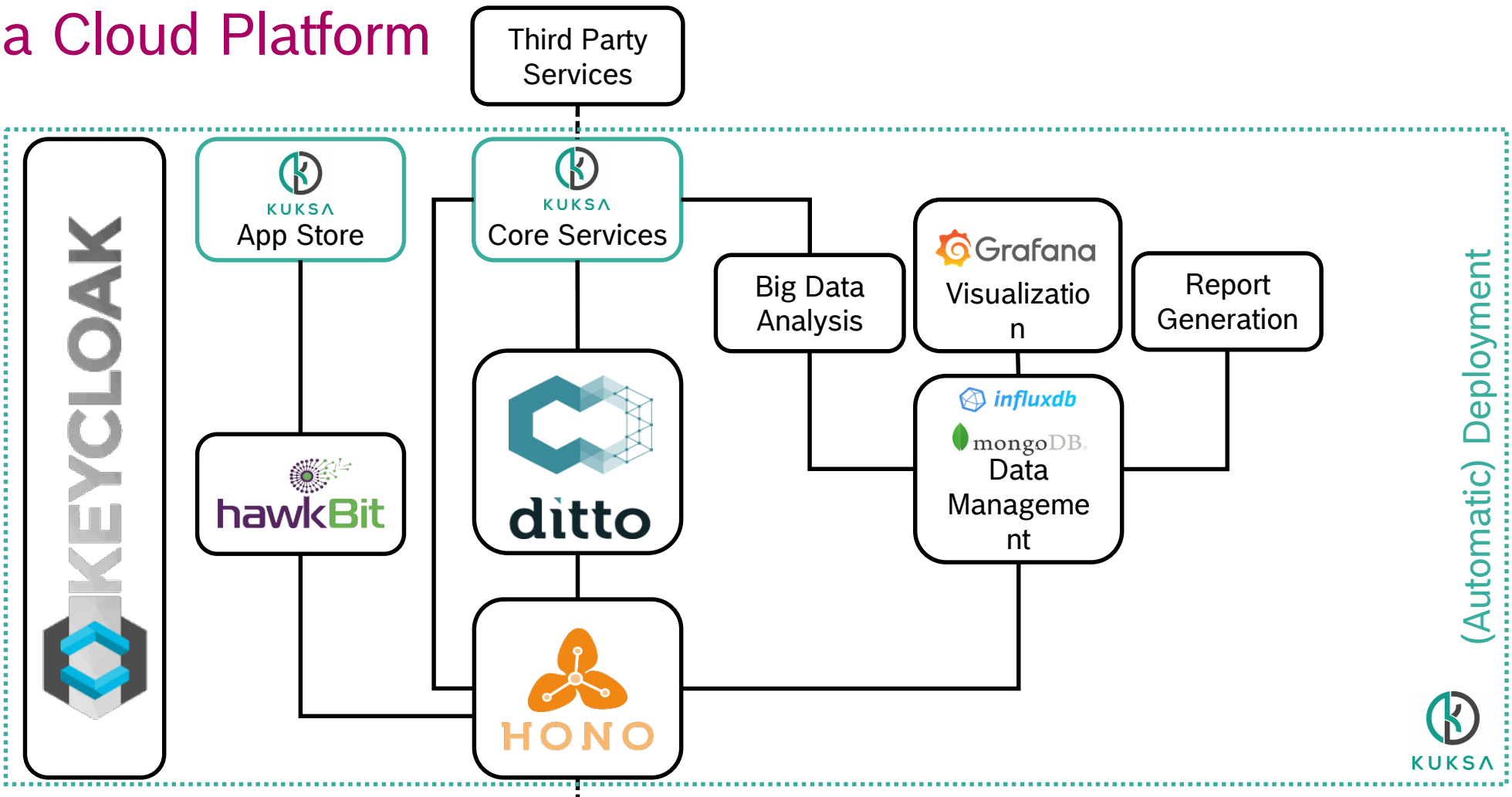
Instead we use and foster Open Source solutions to create a harmonized composition of existing Open Source projects enriched with specific Kuksa components



Some technical details...

# Eclipse Kuksa

## Kuksa Cloud Platform



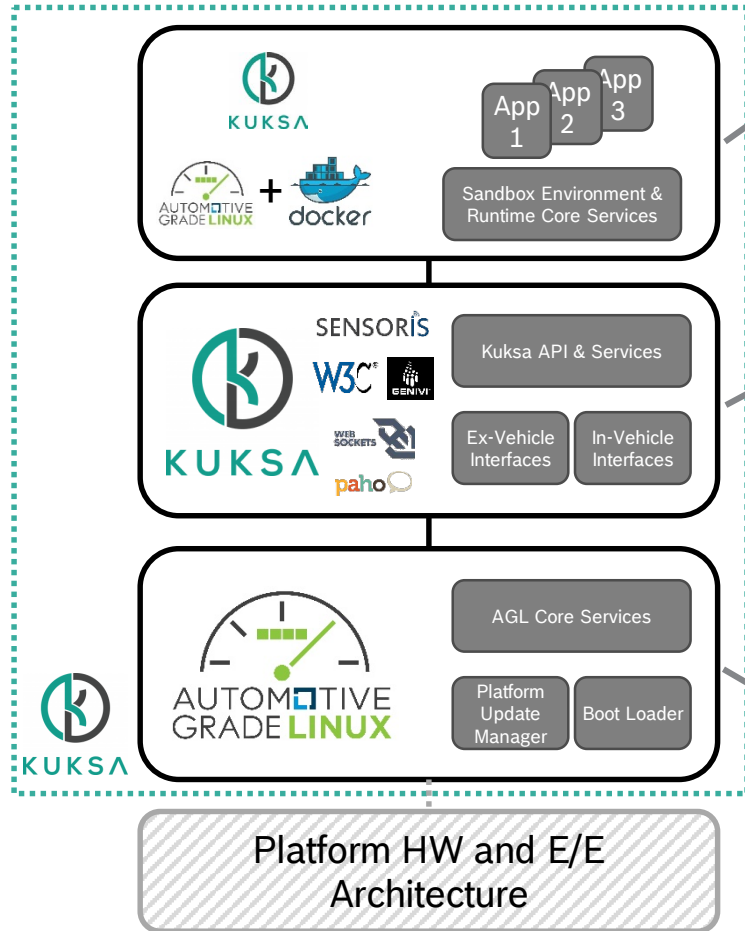
(Automatic) Deployment





# Eclipse Kuksa

## Kuksa In-Vehicle Platform



### Application layer:

- Runs 3<sup>rd</sup> party apps on the platform
- Contains a Sandbox Environment & Additional Services

### Middleware layer (Yocto layer):

- APIs to abstract the vehicles' E/E architecture (W3C VISS, Sensoris...)
- Communication Services to manage network access and provide data from the vehicle
- Includes communication libs, protocols, security layers,...

### OS layer:

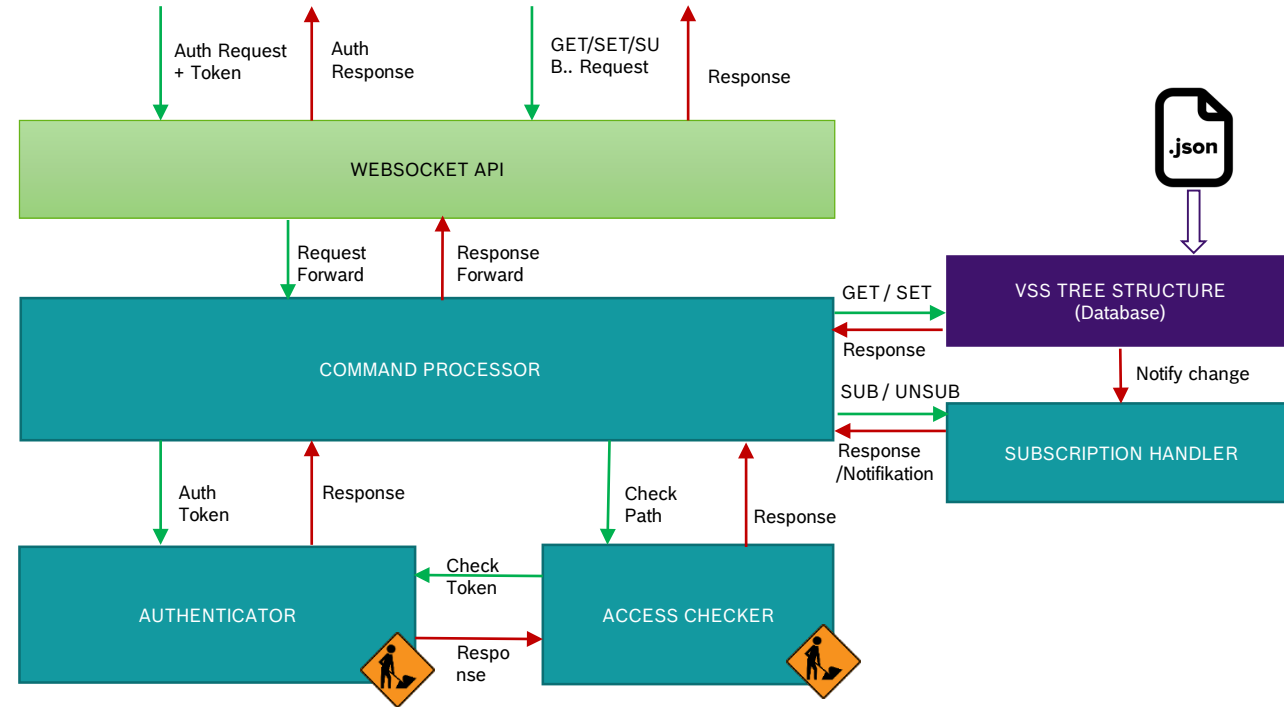
- Reuse of OE's existing services, layers, HW abstractions, AGL services, etc.
- Planned: Debian support (e.g. Apertis)

# Eclipse Kuksa

## Kuksa In-Vehicle Platform

Current focus topic: W3C VISS API

- Implementation of the functional elements is done
- Current focus lays on authentication & access management
- A first proposal for authentication & access has been discussed with the W3C Automotive Working Group

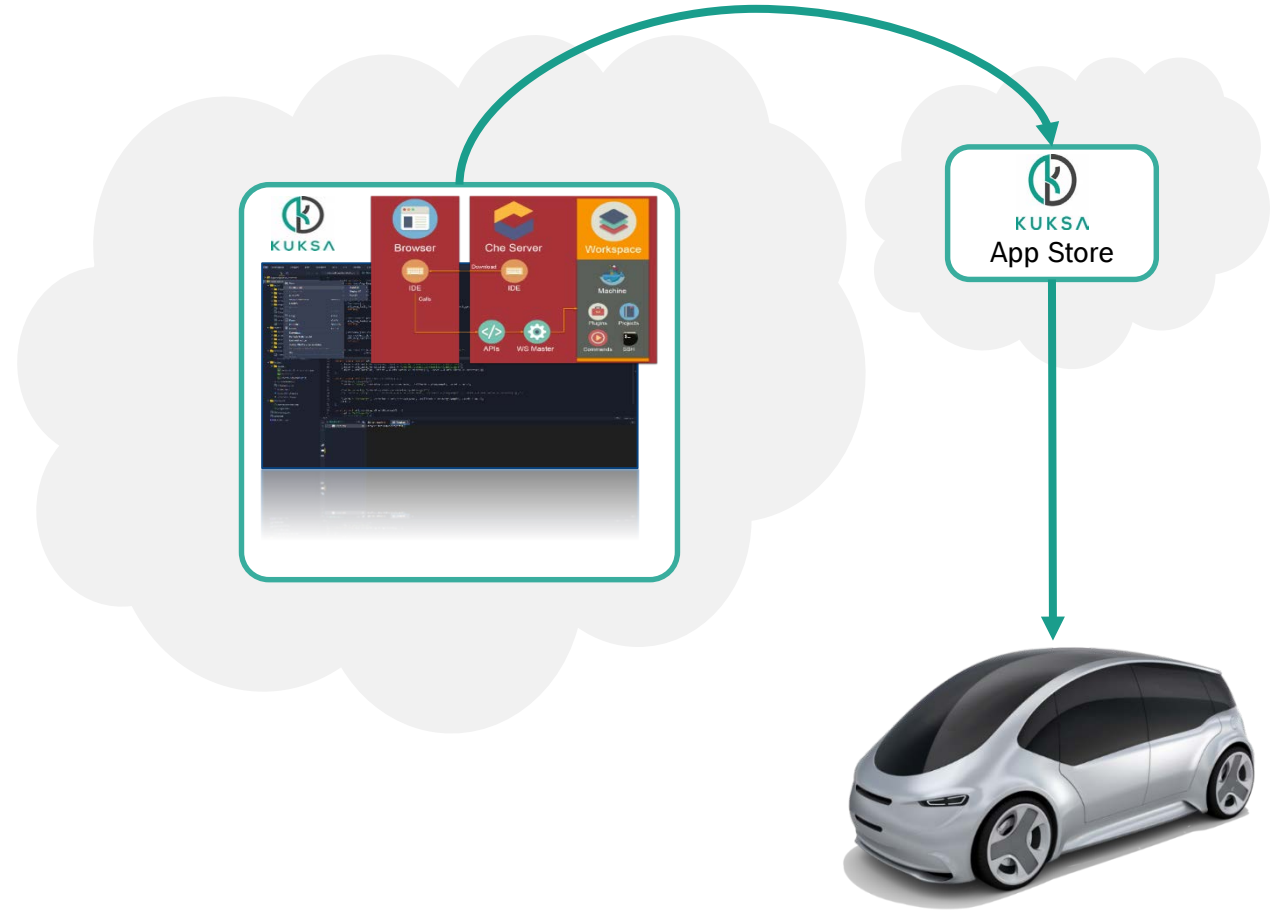


Try it yourself: <https://github.com/eclipse/kuksa.invehicle/tree/master/w3c-visserver-api>

# Eclipse Kuksa

## Kuksa IDE

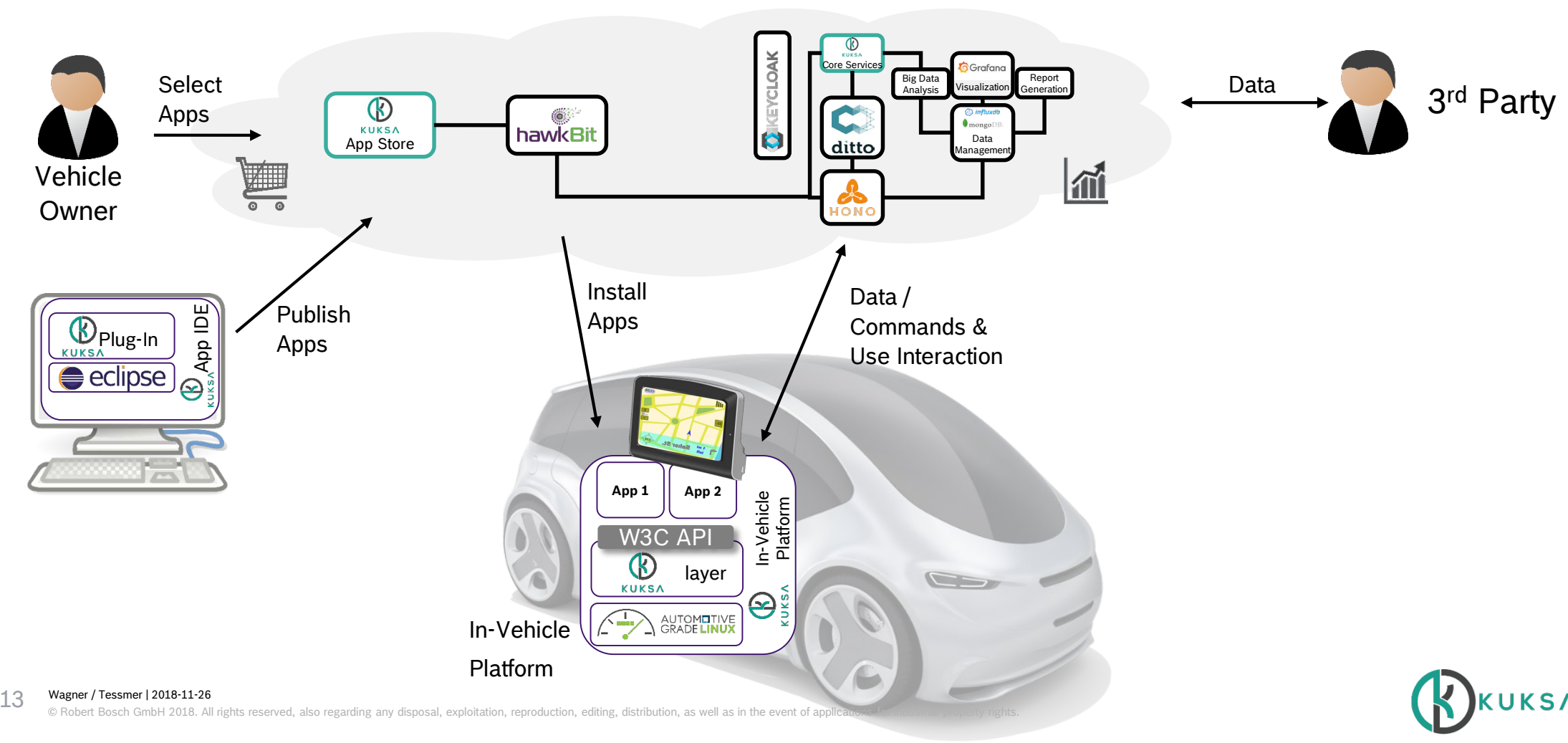
- ▶ Based on Eclipse Che
- ▶ Allows Cloud and In-Vehicle Application development
- ▶ Platform independent
- ▶ Shared workspaces
- ▶ Almost configuration free
- ▶ Docker-based: VPN planned to allow remote / network independent cross compilation



# Potential Deployment Scenarios

# Eclipse Kuksa

## Deployment Variants: Integrated



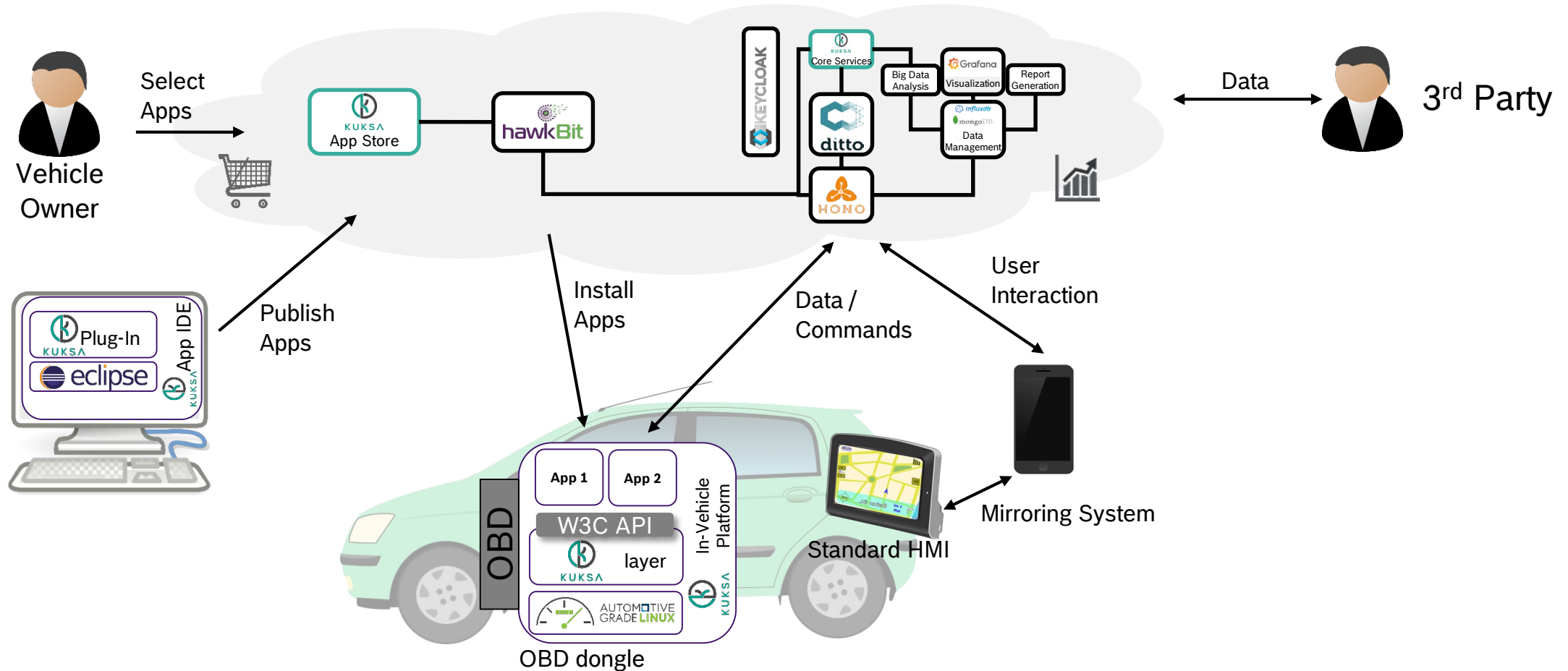
# Kuksa Demo

## Integrated Deployment: Driver authentication



# Eclipse Kuksa

## Deployment Variants: Retrofit





# Kuksa Demo

## Retrofit Deployment: OBD Demonstrator

- ▶ Dongle running the Kuksa In-Vehicle Platform connected to the OBD port
  - ▶ First set-up: Raspberry Pi + Bluetooth OBD Dongle
  - ▶ Kuksa OBD Device is currently being developed
- ▶ Dataset is a bit limited and depends on the vehicle
- ▶ HMI using the Smartphone and Mirroring function of the Head Unit
- ▶ Brings your old car into the cloud

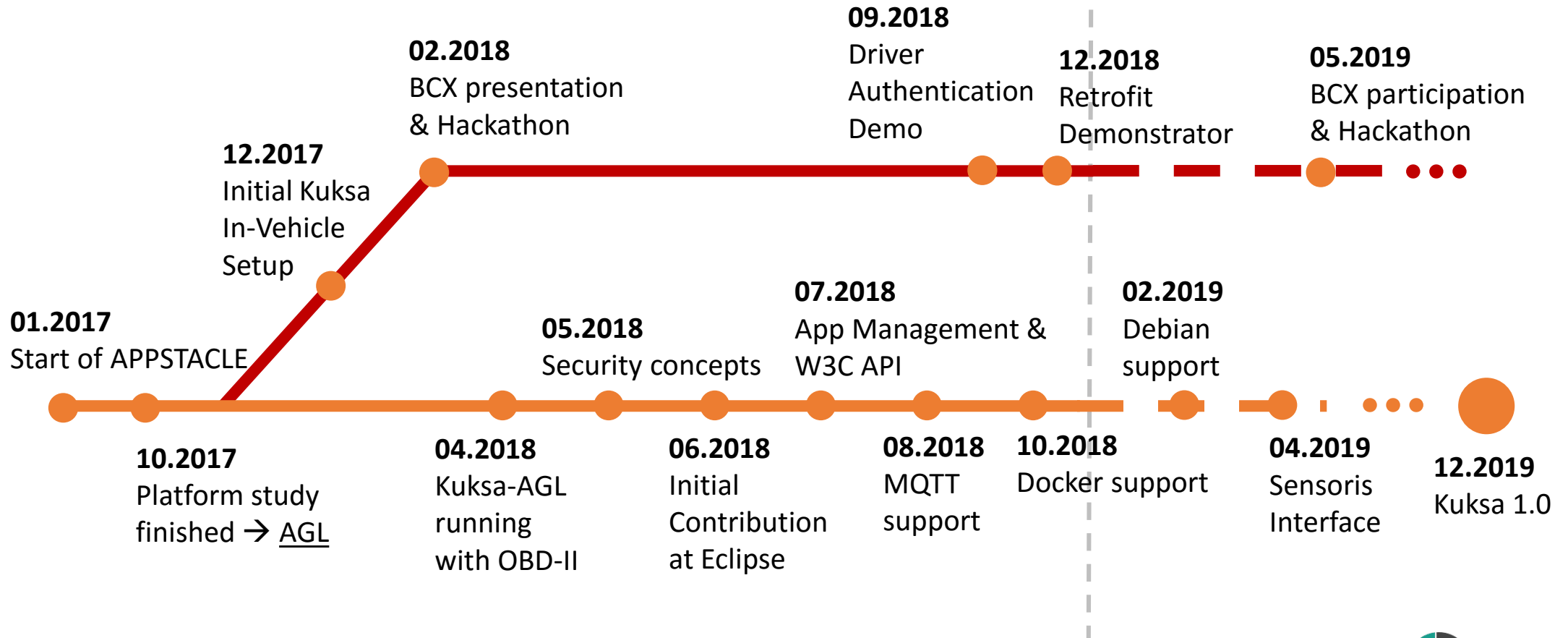




The next steps

# Kuksa Roadmap

## Where to go from here?

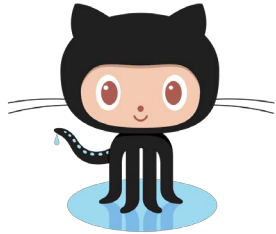


# Kuksa Roadmap

## Where to go from here?



- ▶ Eclipse Kuksa Website
  - ▶ <https://www.eclipse.org/kuksa/>



- ▶ Eclipse Kuksa Codebase
  - ▶ Eclipse Kuksa IDE: <https://github.com/eclipse/kuksa.ide>
  - ▶ Eclipse Kuksa Cloud: <https://github.com/eclipse/kuksa.cloud>
  - ▶ Eclipse Kuksa In-Vehicle: <https://github.com/eclipse/kuksa.invehicle>
  - ▶ Eclipse Kuksa Integration: <https://github.com/eclipse/kuksa.integration>



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# THANK YOU



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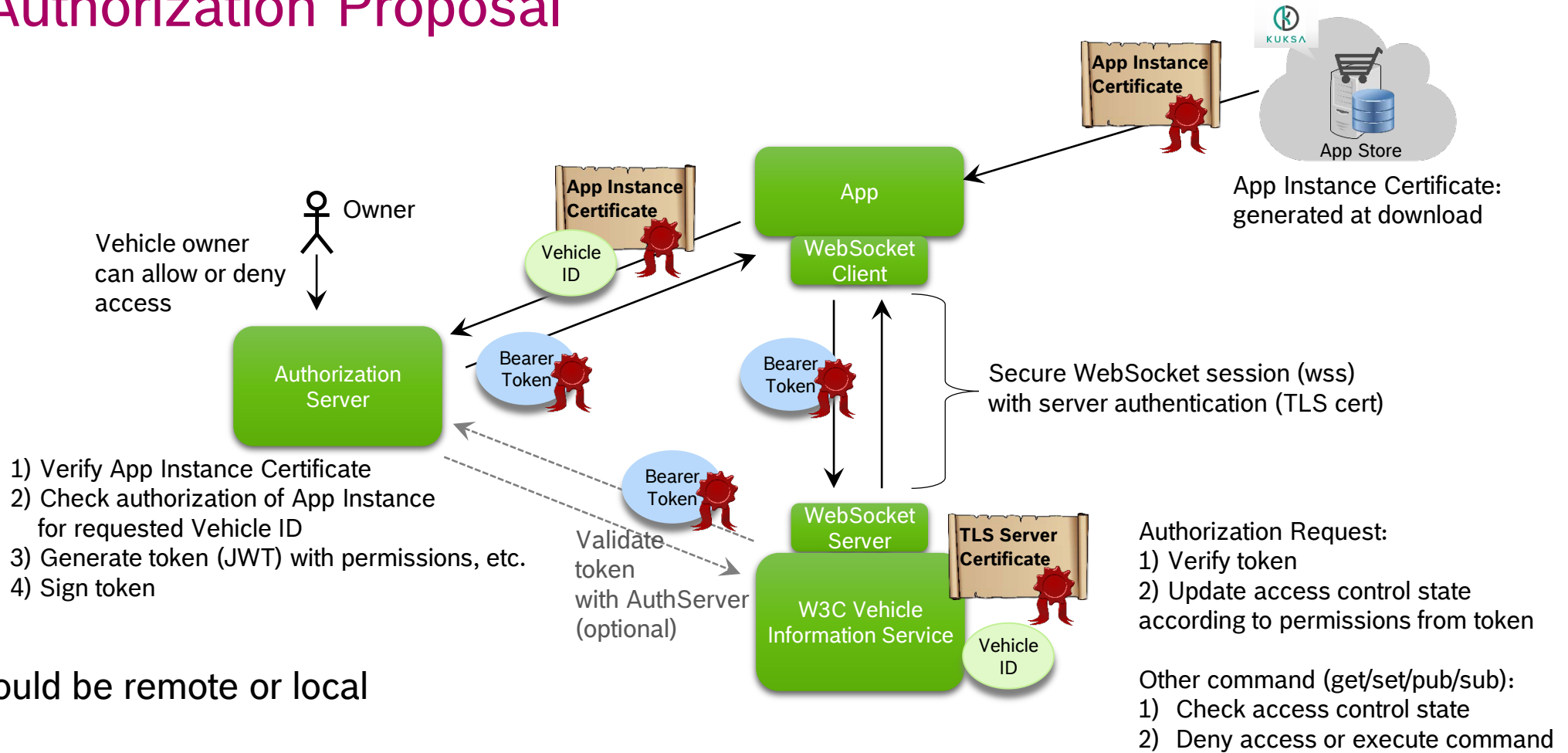
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BackUp

# Kuksa Roadmap

## API Authorization Proposal



► App could be remote or local