



## Android Automotive SIG – Vehicle Data APIs / VHAL

### Project status report

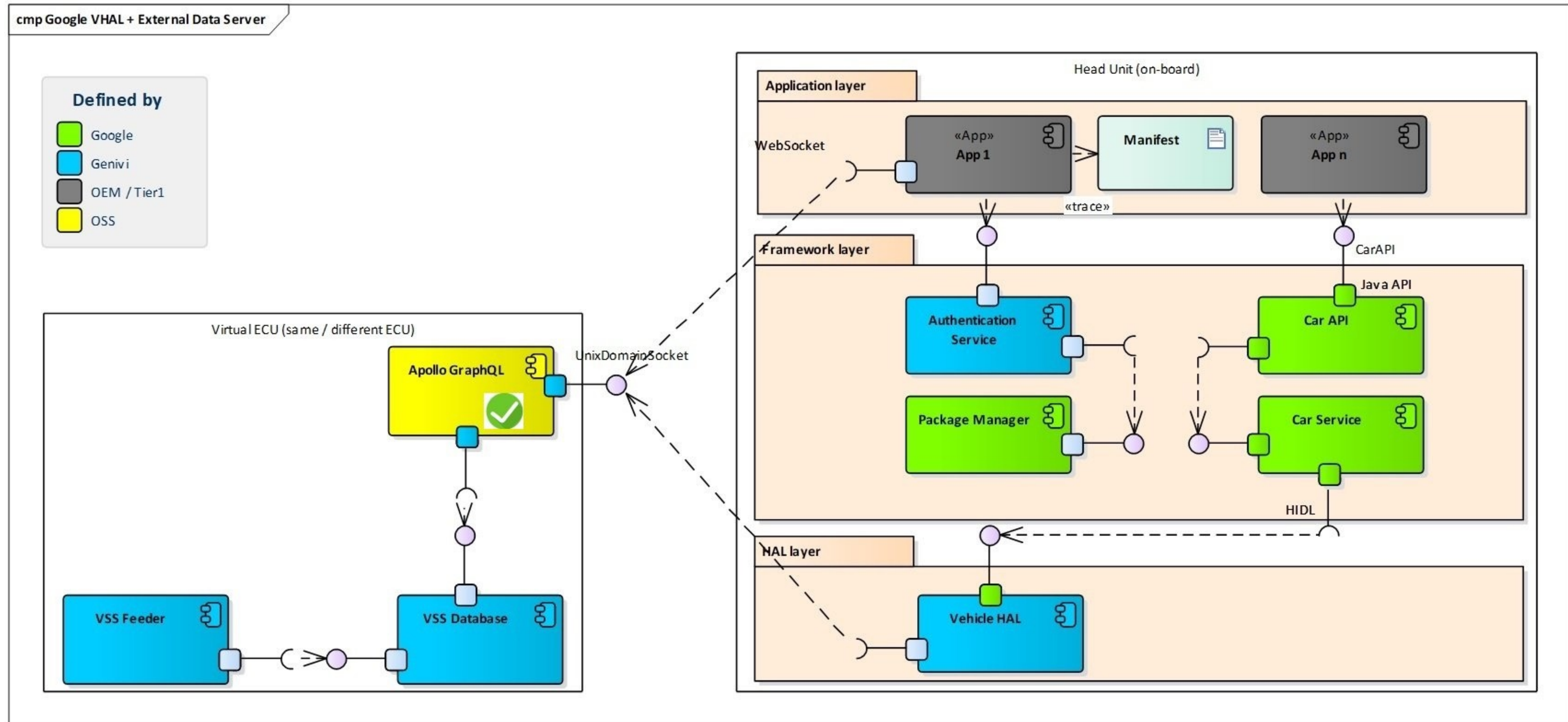
Stefan Wysocki, TietoEVRY

# Agenda



- **External Data Server Framework**
  - PoC implementation
- **Android-side (Head Unit) Components Status**
  - Framework Layer: Authentication service
  - HAL Layer : VHAL
  - Application Layer: App
- **Non-Android In-Vehicle Components Status**
  - VSS feeder
  - VSS database
  - GraphQL

# External Data Server Framework



# Proof-Of-Concept

## Usecase:

- Application wants to read the current fuel level and the tank capacity

## Requirements:

- Read access for signals needs to be protected by a permission: `org.genivi.vss.permission.FUEL_SYSTEM_READ`
- Permission needs to be granted by an authority which is secure
- Data needs to be defined and structured according to VSS
- Data needs to be accessible by the framework as well

# Android-side (Head Unit) Components Status

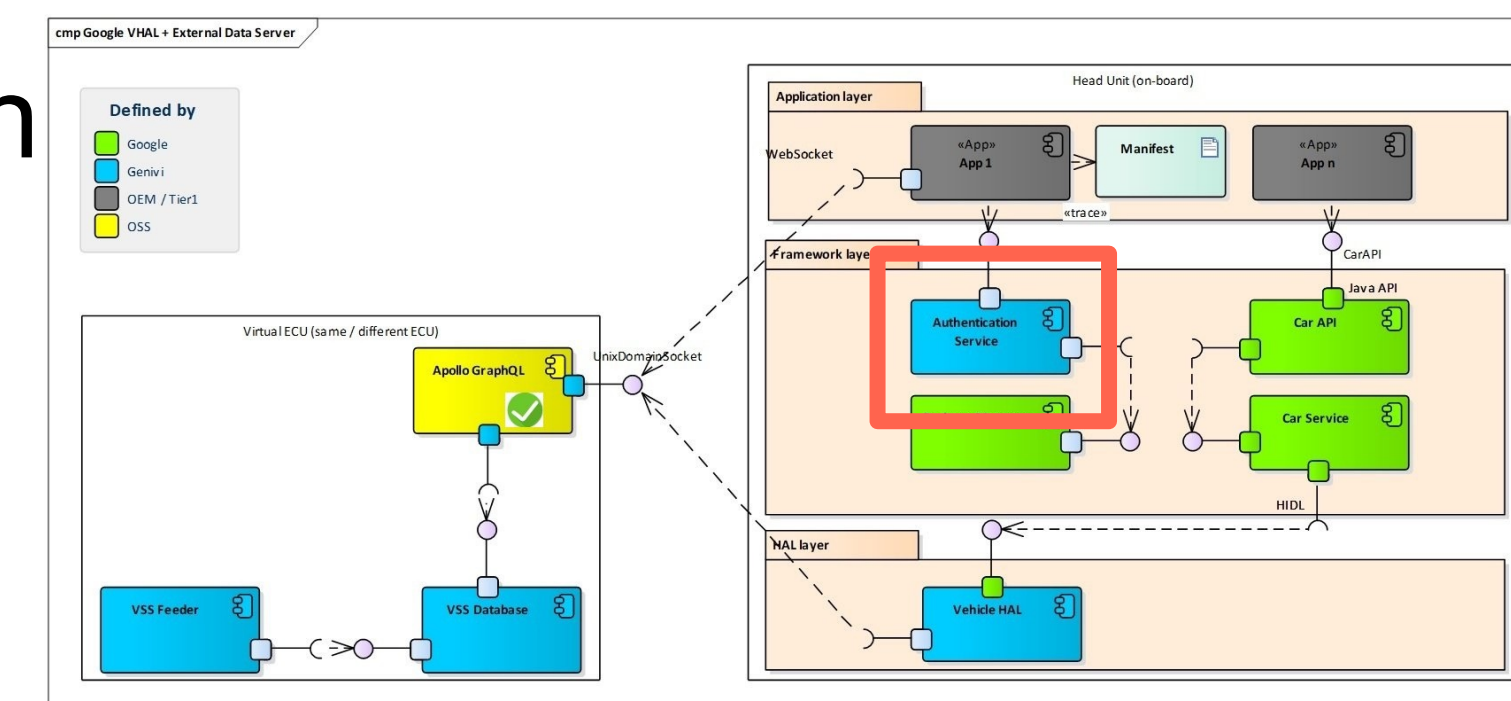
# Framework Layer: Authentication service

- Authority that is able to verify the granted permissions to calling application and generate the token with authentication data

## To be agreed:

- Token signature and the encryption

## Focus



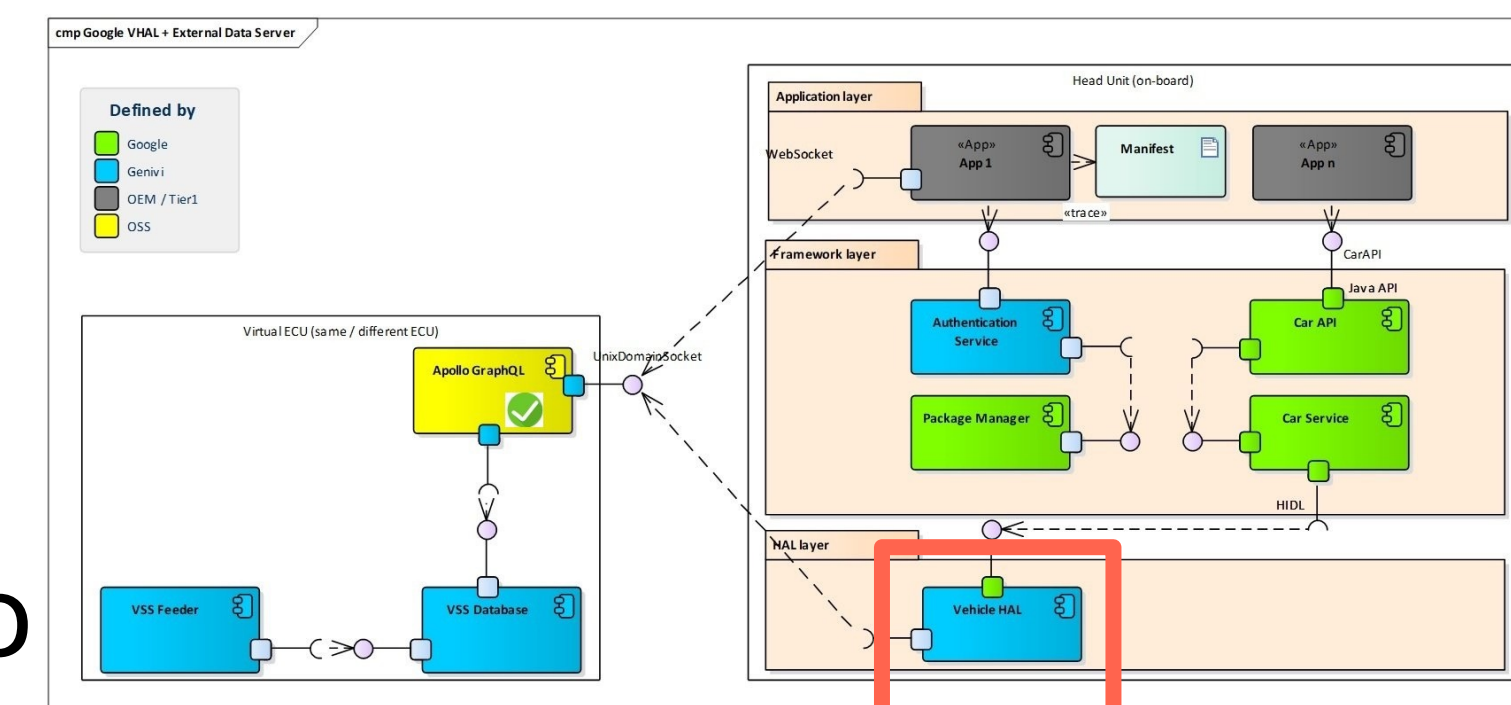
## Proof-of-Concept

<b>Technology</b>	Android Framework
<b>Language</b>	Java
<b>Source</b>	<a href="#">GitHub</a>
<b>Status</b>	<b>WIP</b>

# HAL Layer : VHAL

- Support for Google Automotive Services (GAS)
- Support for framework services (like [CarUxRestrictions](#))
- Based on TietoEVERY VHAL
- Extension has been implemented to provide the properties to the Android Framework queried from GraphQL server
- Currently, the support is limited to „get” calls and „subscribe”

## Focus



## Proof-of-Concept

<b>Technology</b>	Android HAL
<b>Language</b>	Java/C++
<b>Source</b>	<a href="#">GitHub</a>
<b>Status</b>	<b>WIP</b>

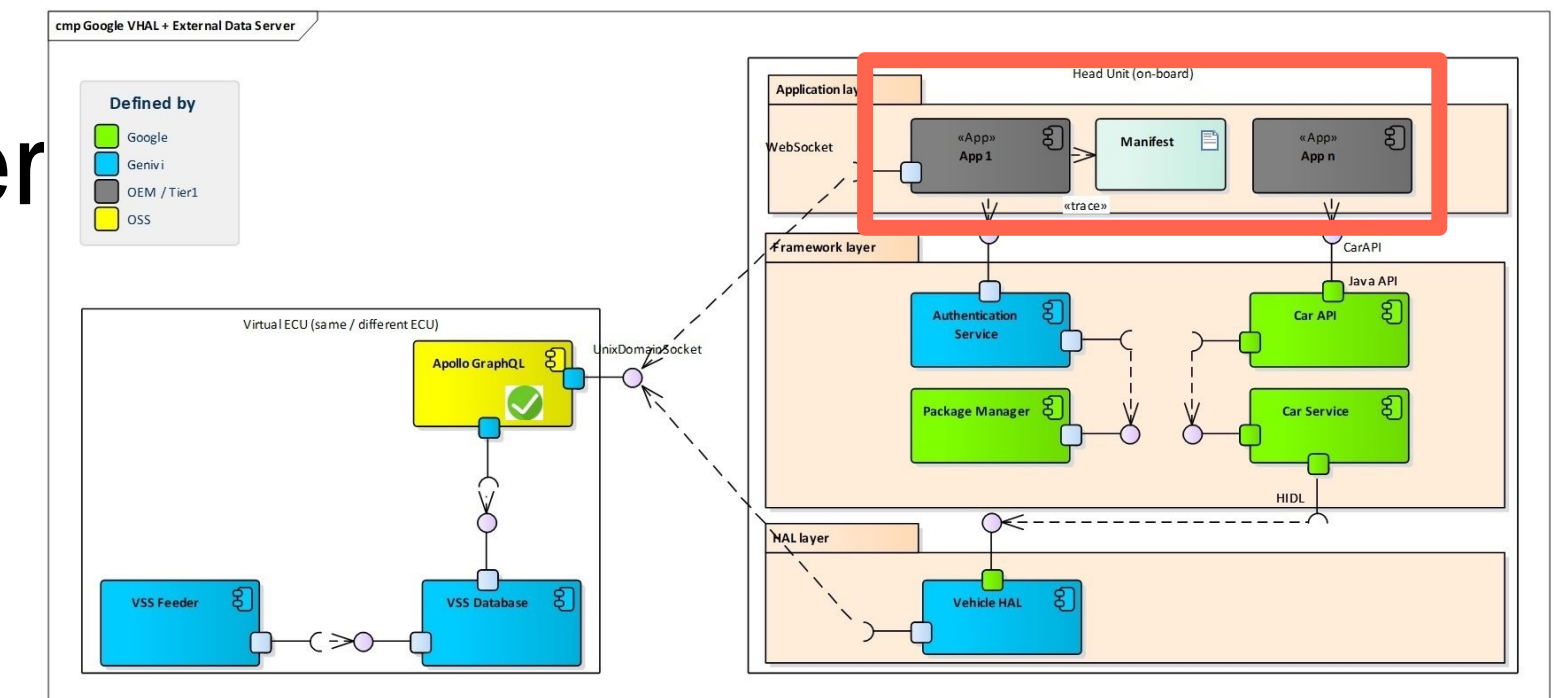
# Application Layer



## 2 applications:

- Application is directly using GraphQL to connect to the server and uses Authenticator Service to generate the token with permissions bundled.
- KitchenSink that uses standard Android API

## Focus



## Proof-of-Concept

<b>Technology</b>	Android APP
<b>Language</b>	Java/Kotlin
<b>Source</b>	<a href="#">GitHub</a>
<b>Status</b>	<b>WIP</b>

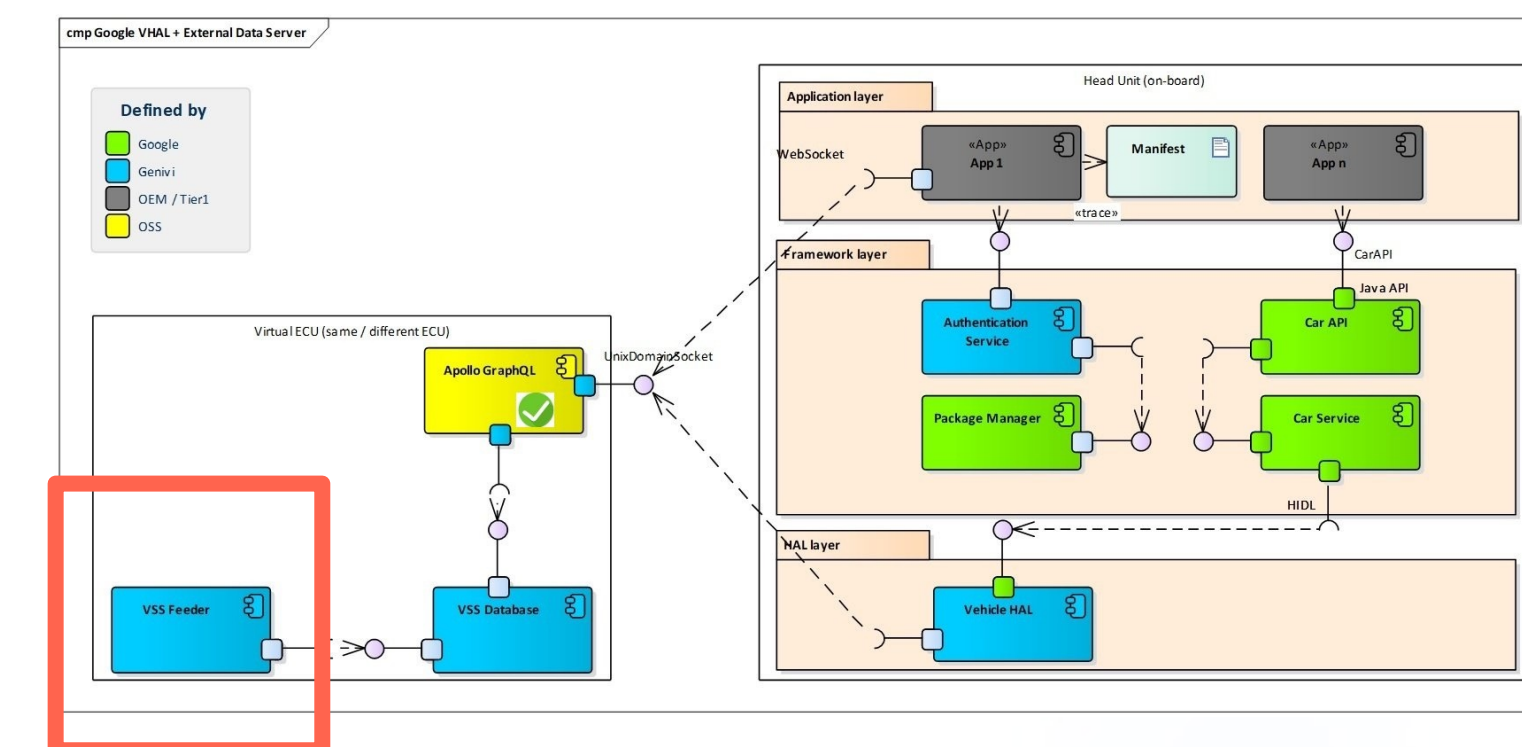


# Non-Android In-Vehicle Components Status

# In-vehicle VSS feeder

- vss-feeder writes the signals from OpenDS into SQLite file, and the other components read from the file. I.e. the database "API" is SQL
- Note: SQLite database schema was not (yet) aligned with CCS project schema)

## Focus



## Proof-of-Concept

<b>Technology</b>	NodeJS
<b>Language</b>	JavaScript
<b>Source</b>	<a href="#">GitHub</a>
<b>Status</b>	<b>WIP</b>

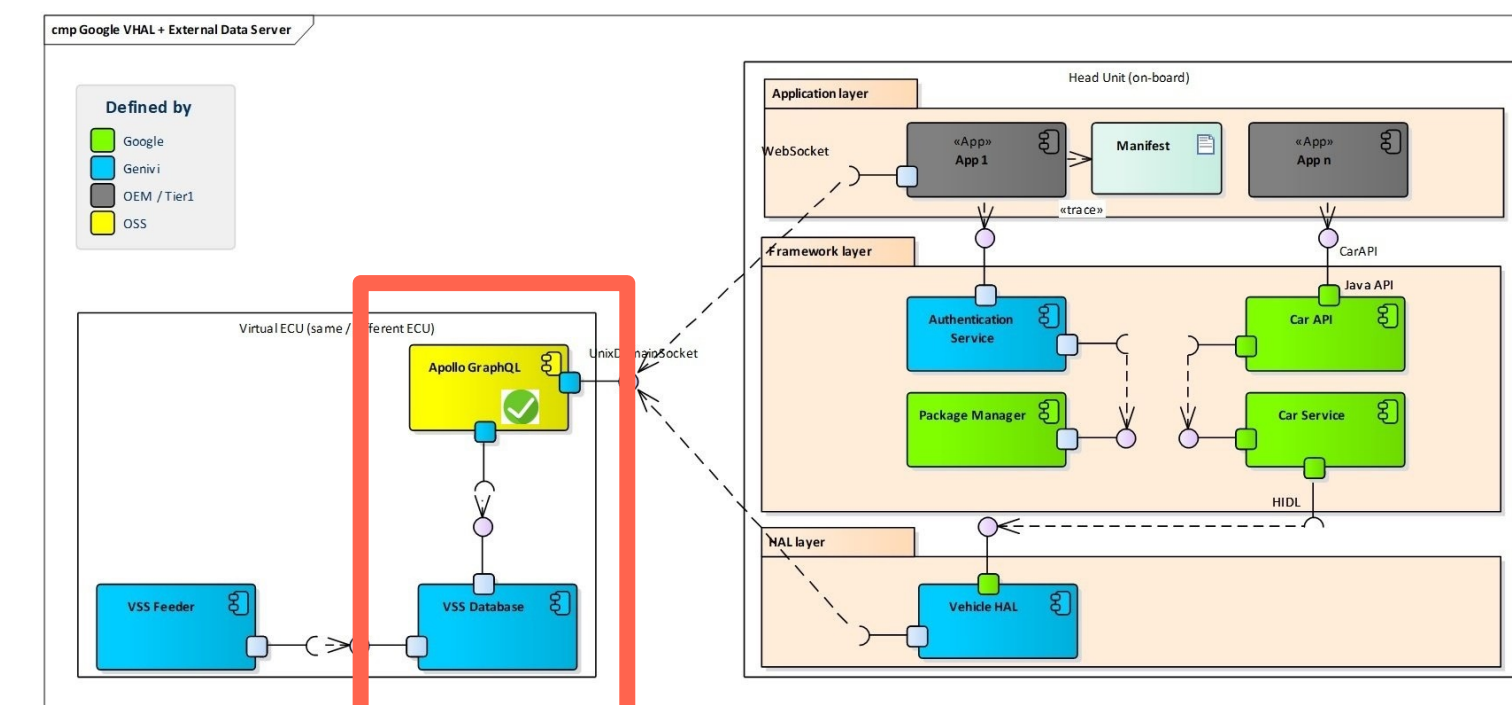
# In-vehicle VSS database

- Access realized by Apollo GraphQL
- Resolve requested data for the APP from the VSS data structure in SQL
- Internal resolvers fetch the data from SQLite.

## To be done:

- Implement the permissions enforcement in the data server

## Focus



## Proof-of-Concept

Technology	NodeJS
Language	TypeScript
Source	<a href="#">GitHub</a>
Status	<b>WIP</b>

# Conclusions and future plans



# Conclusions

- No GraphQL client library found for native services
- „Real time” subscription needed
- Development moved to Android 10, what about 11?

# Future plans

- Implement the permissions enforcement in the data server
- Implement the output of the discussion about the token security
- Updating the property values - usecase needed!
- Restructure the source repositories

# Repository structure

- For Android components: AOSP + local\_manifests
- Additional repository for „Genivi” flavoured devices containing the product configuration
- Unify branching strategies for maintaining multiple Android version
- For non-Android components: centralized repository with sub-repositories (VSS feeder + Apollo GraphQL)

**DEMO**







# Contributing

- Weekly telcos:  
Tuesdays – 17:00 CET (US friendly time) – Vehicle Data APIs / VHAL
- Android Automotive Project Wiki :  
<https://at.projects.genivi.org/wiki/x/XgA4Ag>

# Thank you!

**Visit GENIVI:**

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<http://projects.genivi.org>

**Contact us:**

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