

# ASAM SOVD

Motivation, Standardization, Features, and Tooling

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Jeju



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2	Standardization
3	Features
4	Tooling

# Motivation

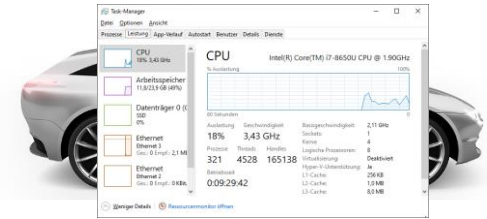
Which challenges are we facing for diagnosing SDV?



new architectures based on HPCs,  
multiple OS, different applications and  
their dependencies



Focus **extends** from identifying  
**hardware errors** to fixing  
**software issues.**



**SW-analysis** requires Logs,  
Traces, Process information,  
Stack-traces



Diagnostic content in the  
vehicles will be **changing  
dynamically**



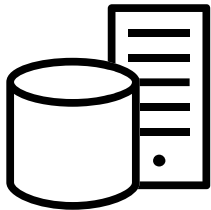
**SW-update** will change to controlling a  
**complex update procedure** in the  
vehicle.

# Motivation

Why not UDS for diagnosing SDV?



Perfectly designed for **classic ECUs**, but not sufficient for **HPCs** and **Apps**



22F10021300223378

Not designed to be flexible,  
requires **static description** of content

Data required for diagnosing **SW-based systems** does not fit to today's UDS (byte-) based world



Log or trace file accumulated for a time span and structured

Supplemental data to analyze an error, e.g. Stack trace or Snapshot data



Information on SW removal/uninstallation, update/installation and update management



Representing complex SW structure and dependencies

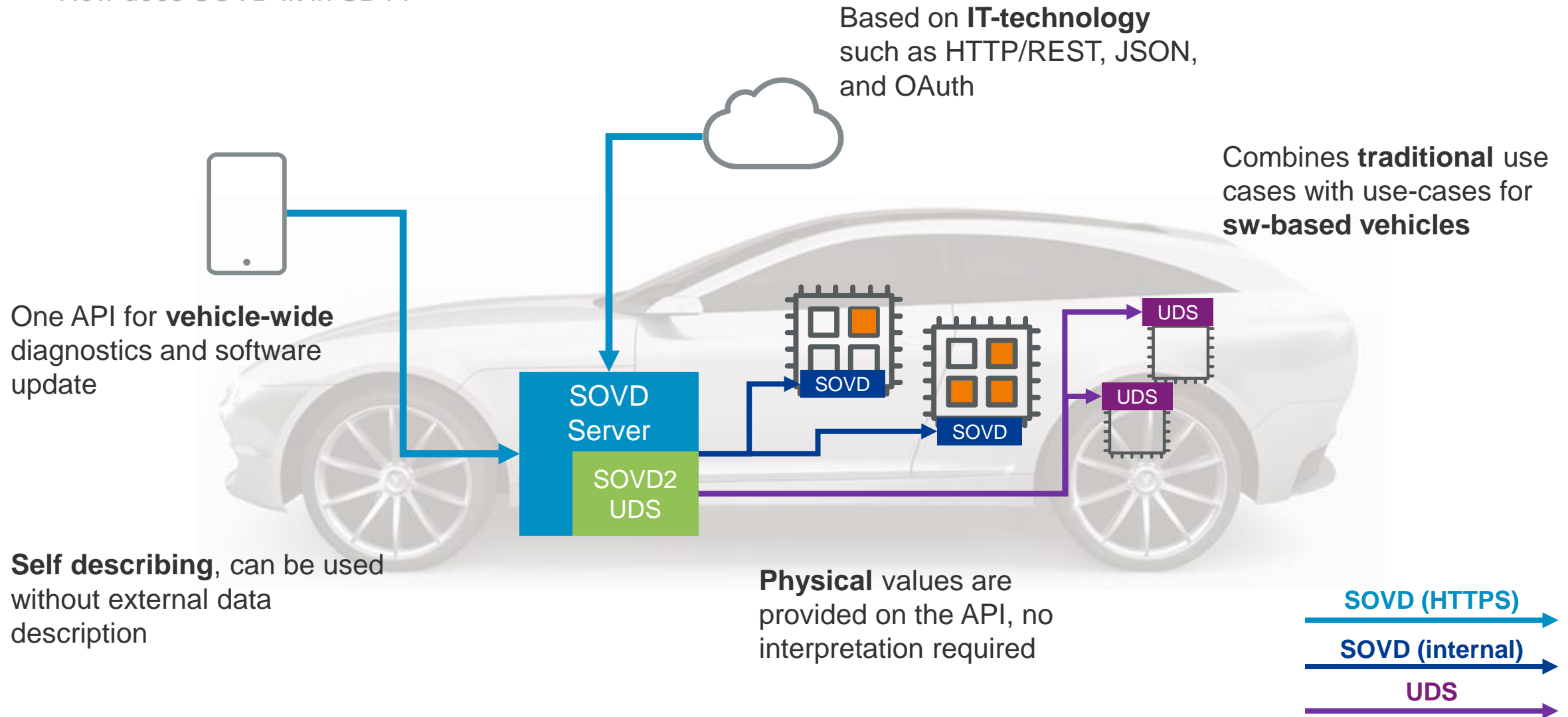
Required to interact with various IT interfaces of Apps

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# Standardization

How does SOVD fit in SDV?



# Standardization

ASAM, ISO, AUTOSAR



SOVD v1.0: Released 07/22

- ▶ Core SOVD Functionality
- ▶ Core Diagnostic Features

SOVD v1.1: Release 12/24

- ▶ Enhanced Use-Cases for SW-Diagnosis, Asynchronous Data Access

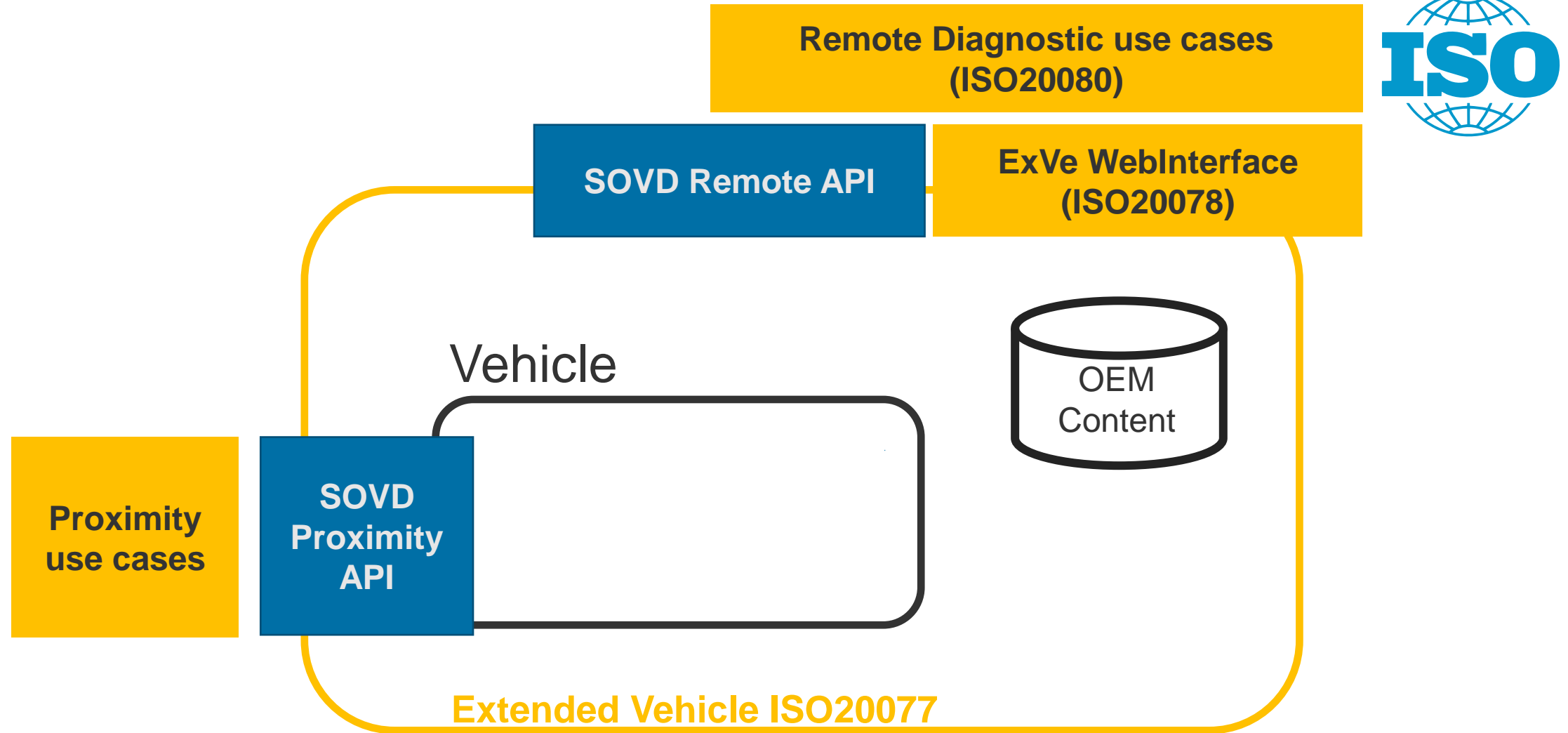
ISO Activities started in May 2023, release Planned for Mid 2025

- ▶ Alignment of definitions, terminology and use-cases with ExVe (SC31/WG6)
- ▶ No changes to the API envisioned

- ▶ Explanatory + initial Version of SOVD Support included in R22/11
- ▶ Concept will be detailed further with R23/11

# Standardization

ISO activities with SOVD





# Standardization

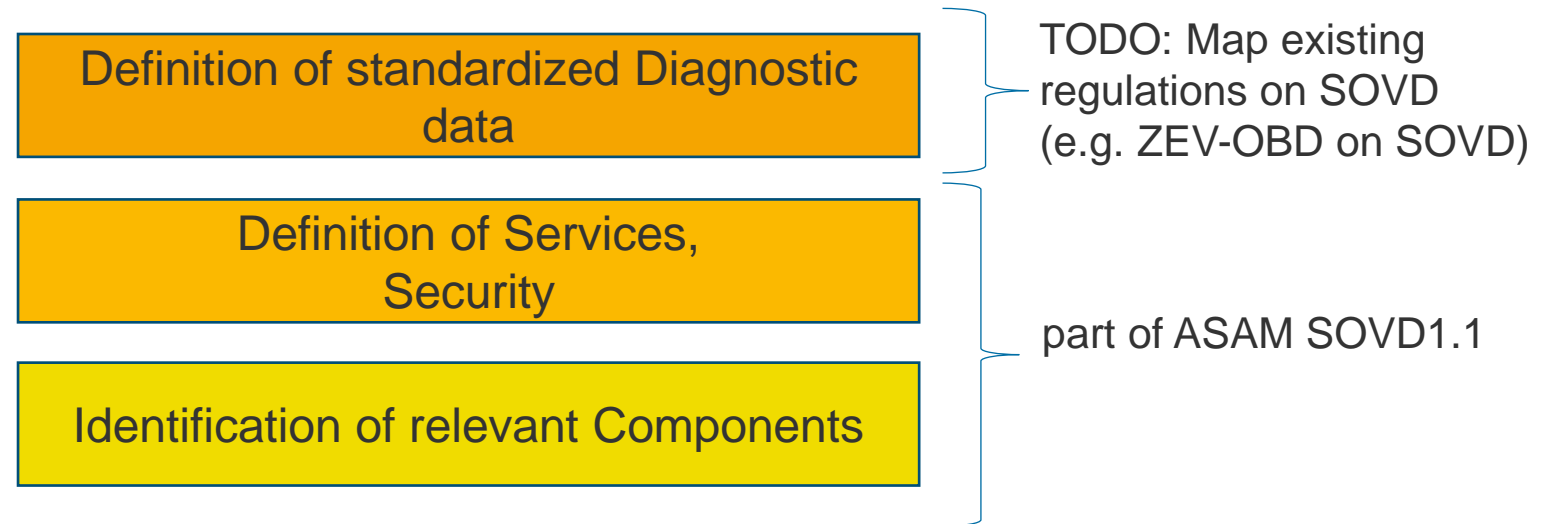
SOVD as basis for legislative use cases



SAE J1979-2 (OBDonUDS)

SAE J1979-3 (ZEVonUDS)

ISO 20730 (ePTI)



# Contents

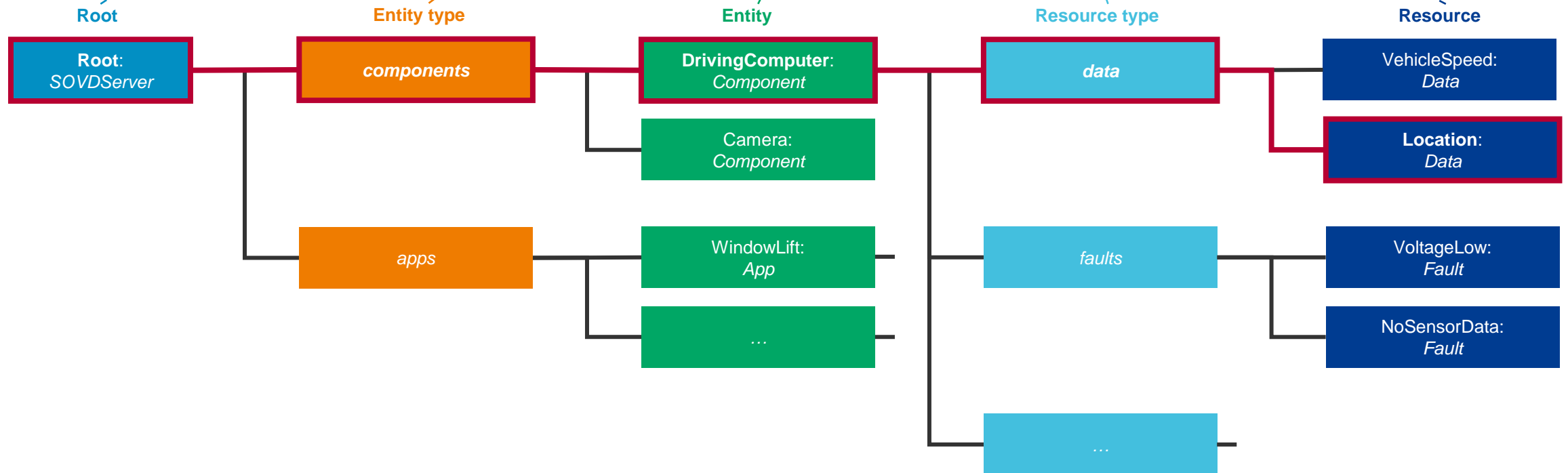
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# Features

SOVD Request

SOVD Request

GET <https://sovd.io/components/DrivingComputer/data/Location> HTTP/1.1



# Features

SOVD Response

SOVD Request

```
GET https://sovd.io/components/DrivingComputer/data/Location HTTP/1.1
```

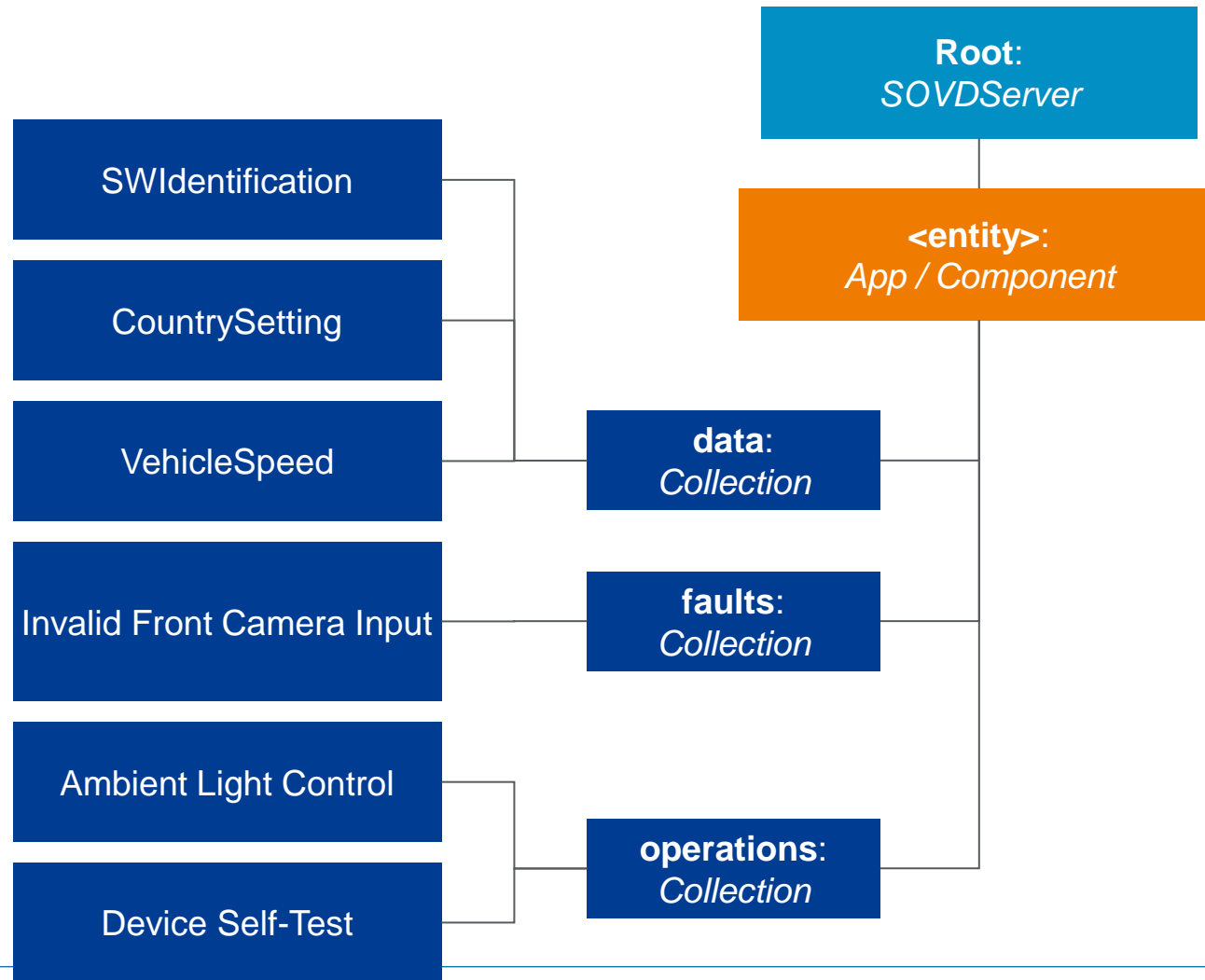
SOVD Response

```
HTTP/1.1 200 OK
Content-Type: application/json;charset=UTF-8

{
  "id": "Location",
  "data": {
    "latitude": 48.82390,
    "longitude": 9.09733,
    "height": 1007,
  }
}
```

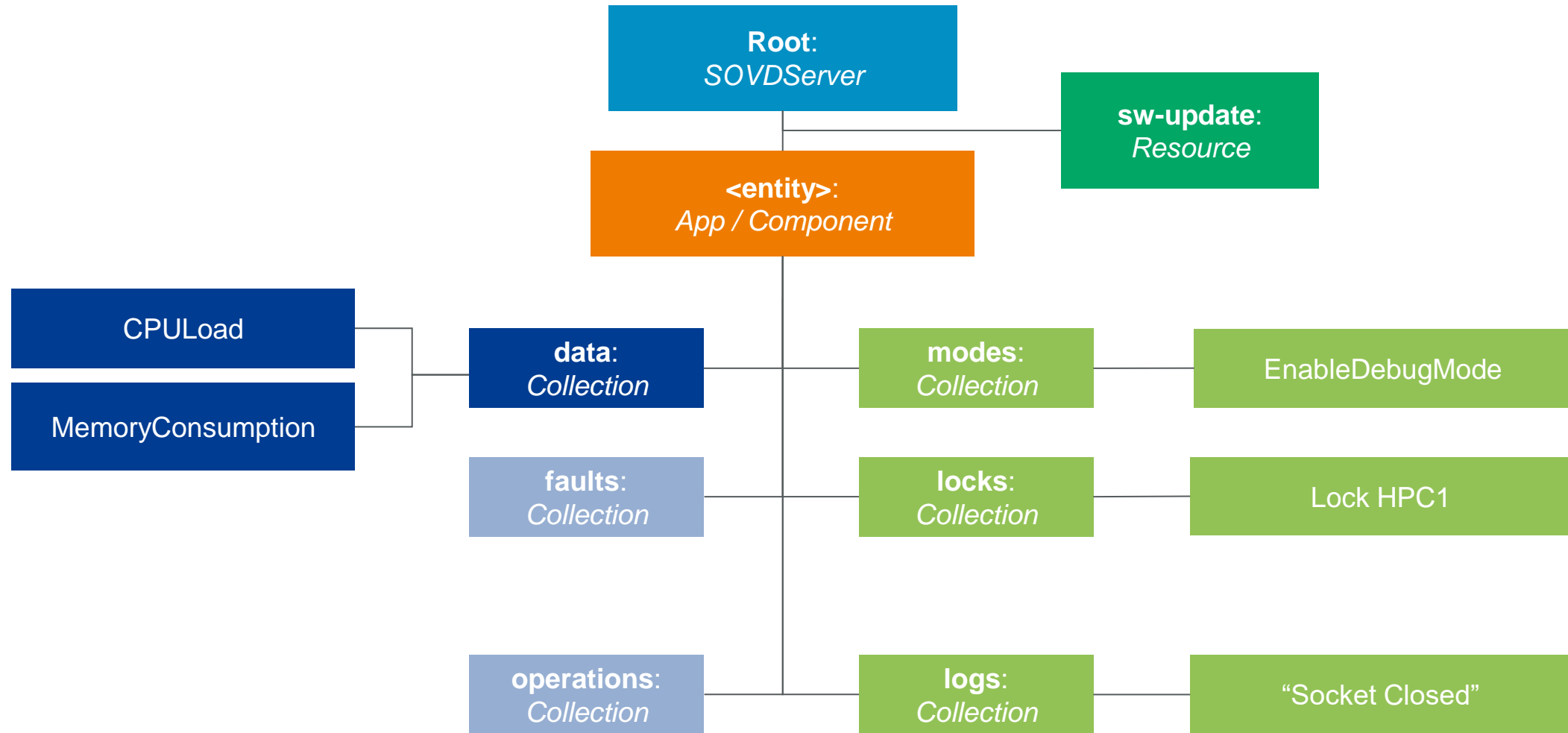
# Features

SOVD features for traditional use-cases



# Features

SOVD features for future SDV



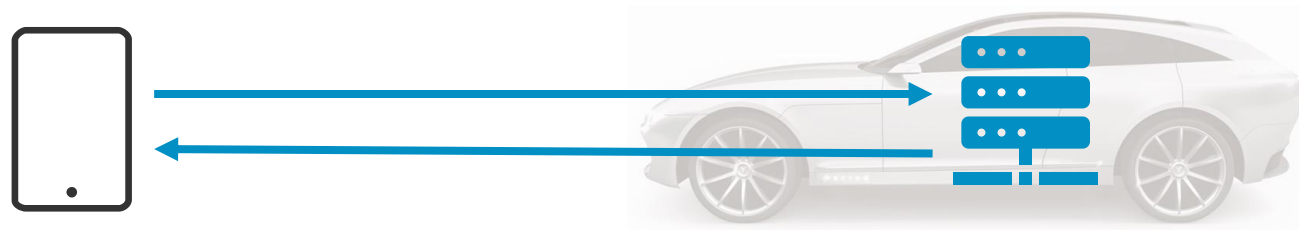
# Features

## Capability Discovery and Capability Description

- Capability Discovery allows the direct access to a vehicle without the need of a database

Component	URL
ABS_ESP	<a href="http://localhost:34568/Vehicle/v1/components/abs_esp">http://localhost:34568/Vehicle/v1/components/abs_esp</a>
CCU	<a href="http://localhost:34568/Vehicle/v1/components/ccu">http://localhost:34568/Vehicle/v1/components/ccu</a>
DCM	<a href="http://localhost:34568/Vehicle/v1/components/dcm">http://localhost:34568/Vehicle/v1/components/dcm</a>
ECM	<a href="http://localhost:34568/Vehicle/v1/components/ecm">http://localhost:34568/Vehicle/v1/components/ecm</a>
FEM	<a href="http://localhost:34568/Vehicle/v1/components/fem">http://localhost:34568/Vehicle/v1/components/fem</a>

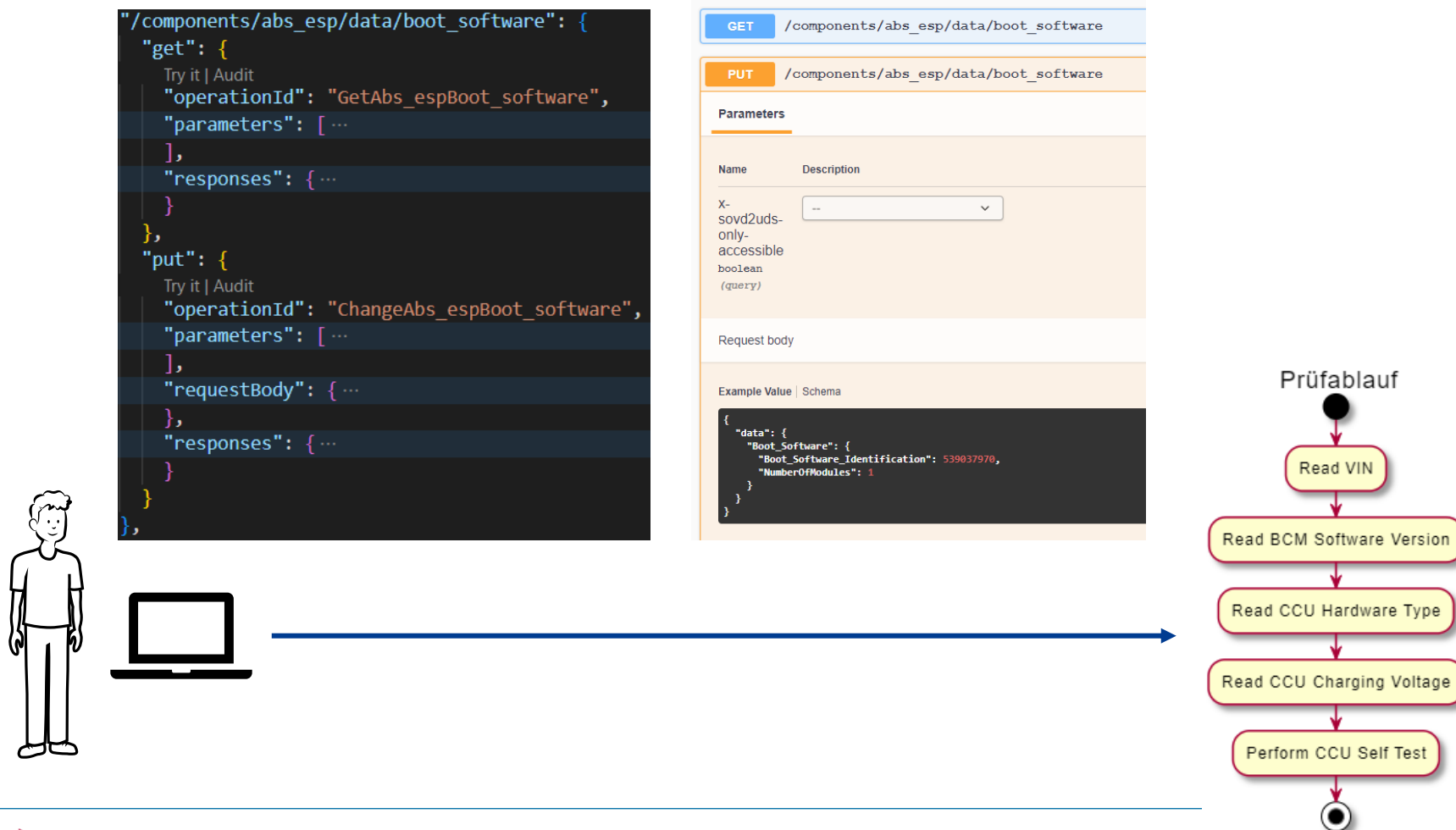
```
"paths": {  
  "/components/dcm/data/boot_software": {  
    "get": {  
      "operationId": "GetDcmBoot_software",  
      "parameters": [...],  
      "responses": {...},  
    },  
    "put": {  
      "operationId": "ChangeDcmBoot_software",  
      "parameters": [...],  
      "requestBody": {...},  
      "responses": {...},  
    }  
  }  
}
```



# Features

## Capability Discovery and Capability Description

- Capability Description is used for the development during production and for the after-sales use case

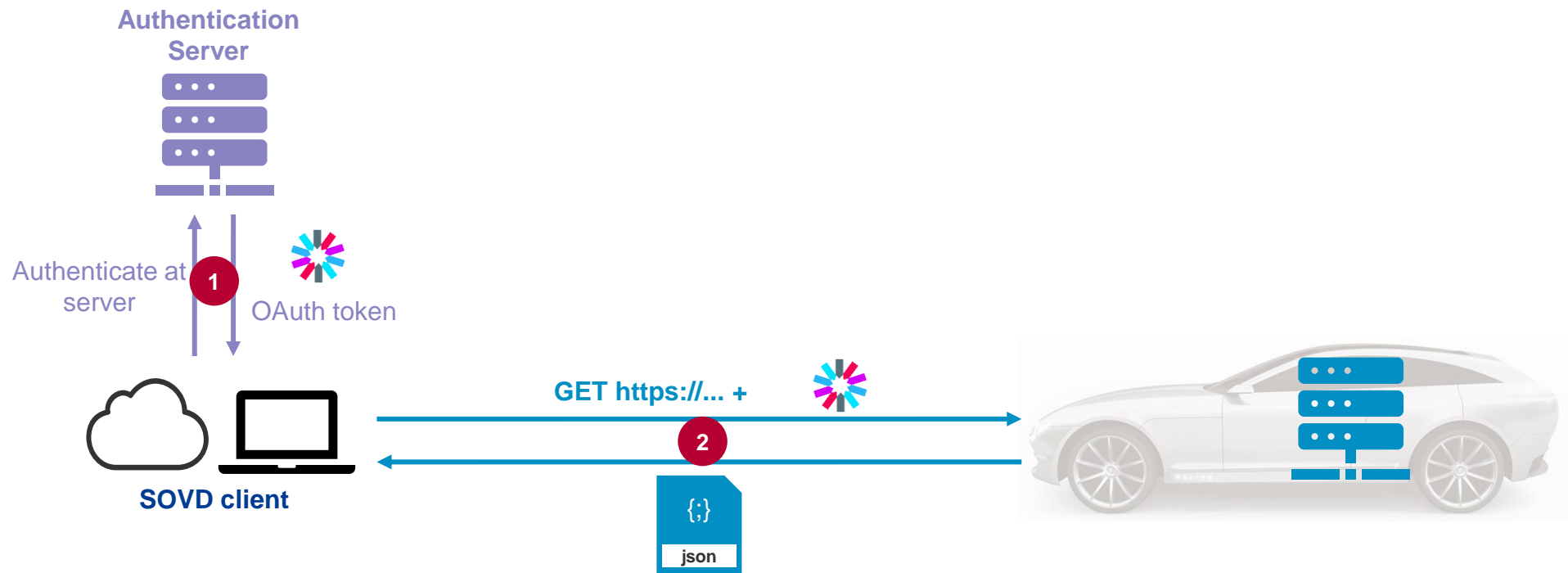




# Features

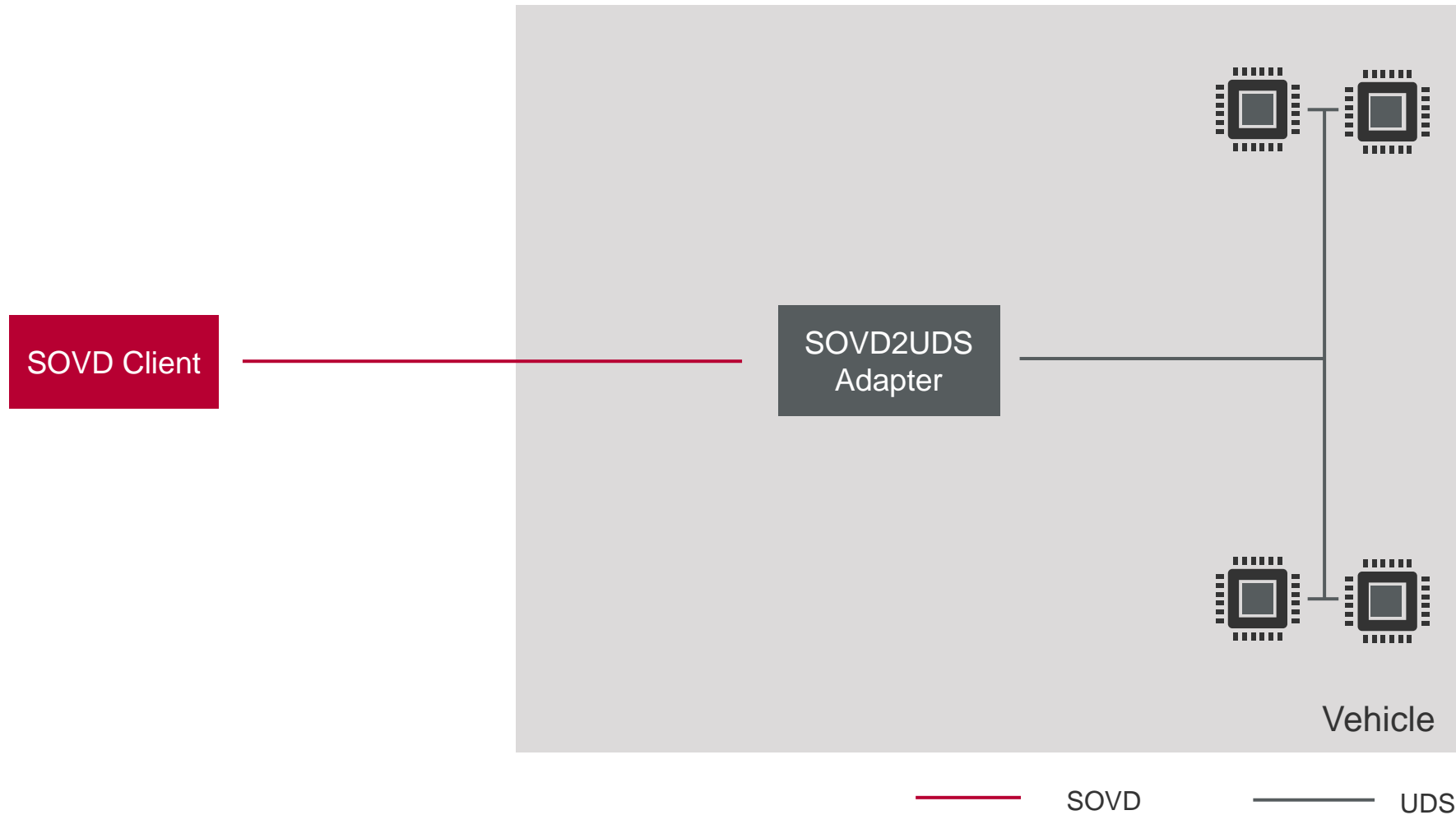
## Authentication and Authorization

- ▶ Step 1: Authenticate at backend server → Result: OAuth token
- ▶ *Alternative for proximity use case: Obtain OAuth token via SOVD API*
- ▶ Step 2: Client uses OAuth token to prove that he is entitled to perform SOVD method



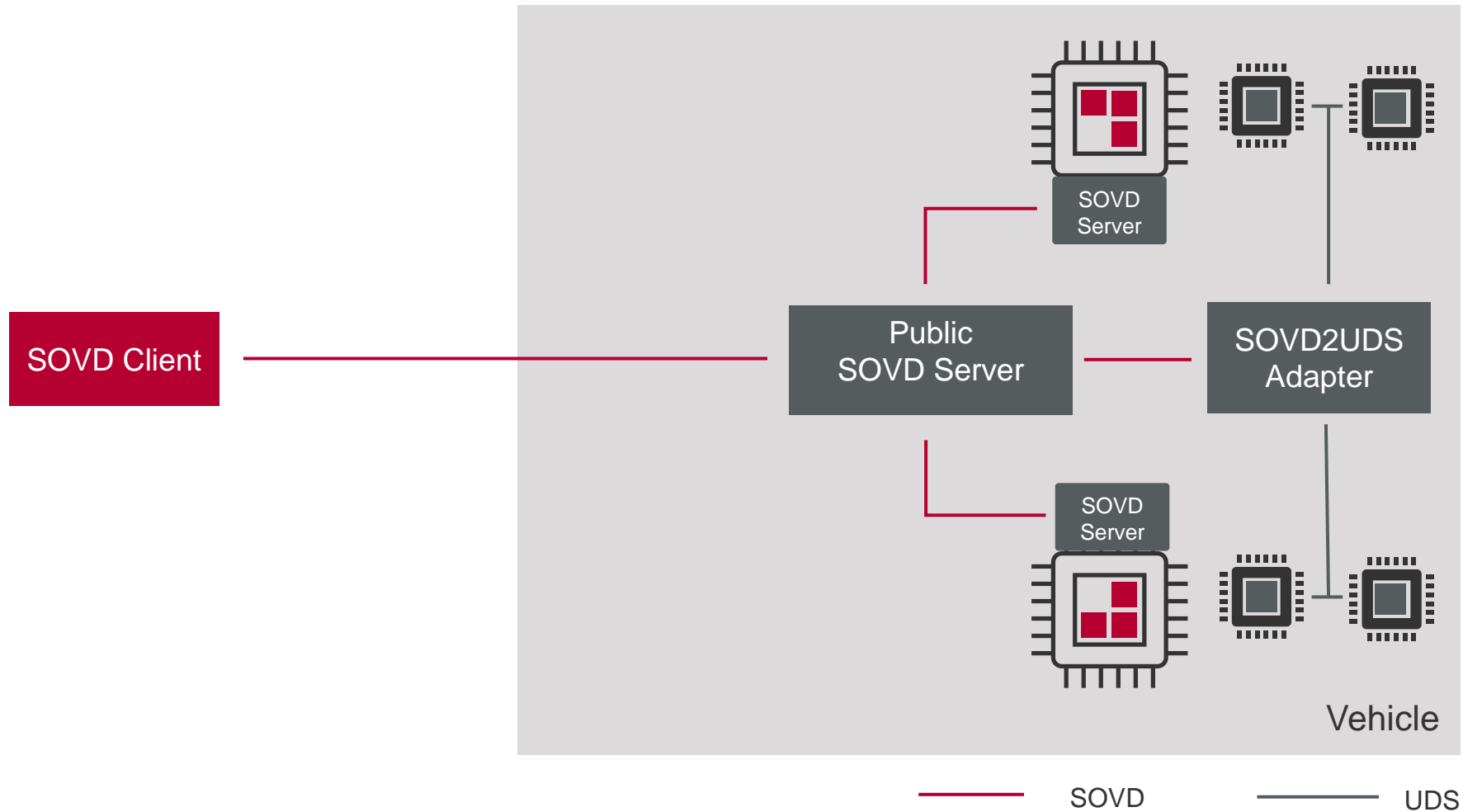
# Features

Scaling usage – UDS components in vehicle



# Features

Scaling usage – Mixed setup of SOVD native and UDS components in vehicle

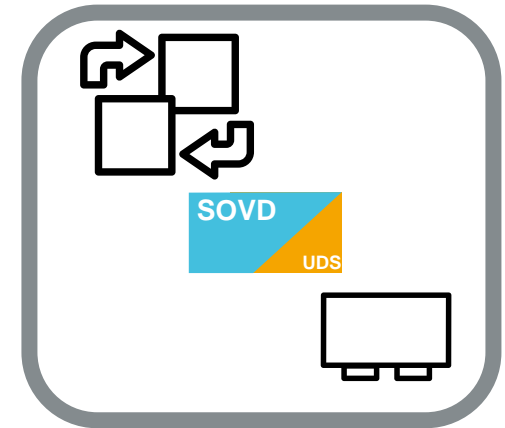
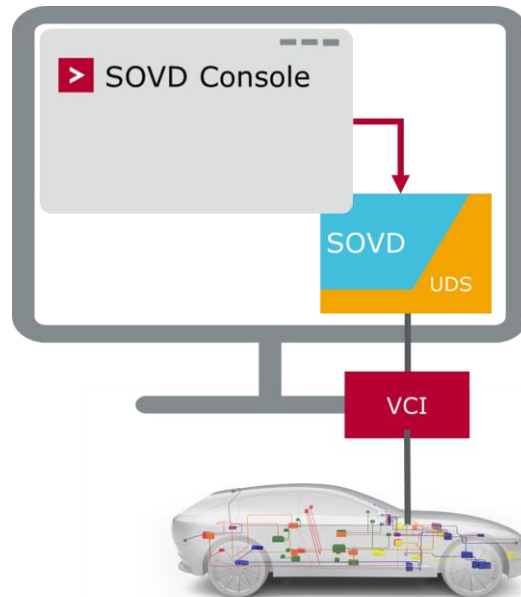
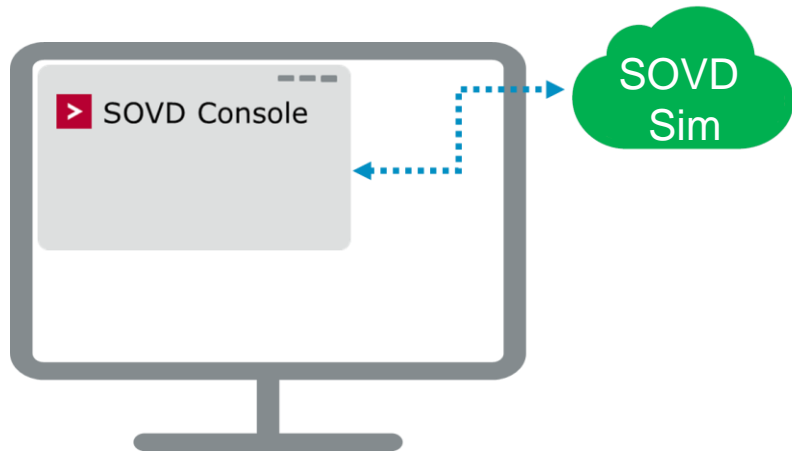


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# Tooling

Explore SOVD today



SOVD Demonstrator  
(<http://console.sovd.io>)

Get familiar with SOVD / API

SOVD Starter Kit

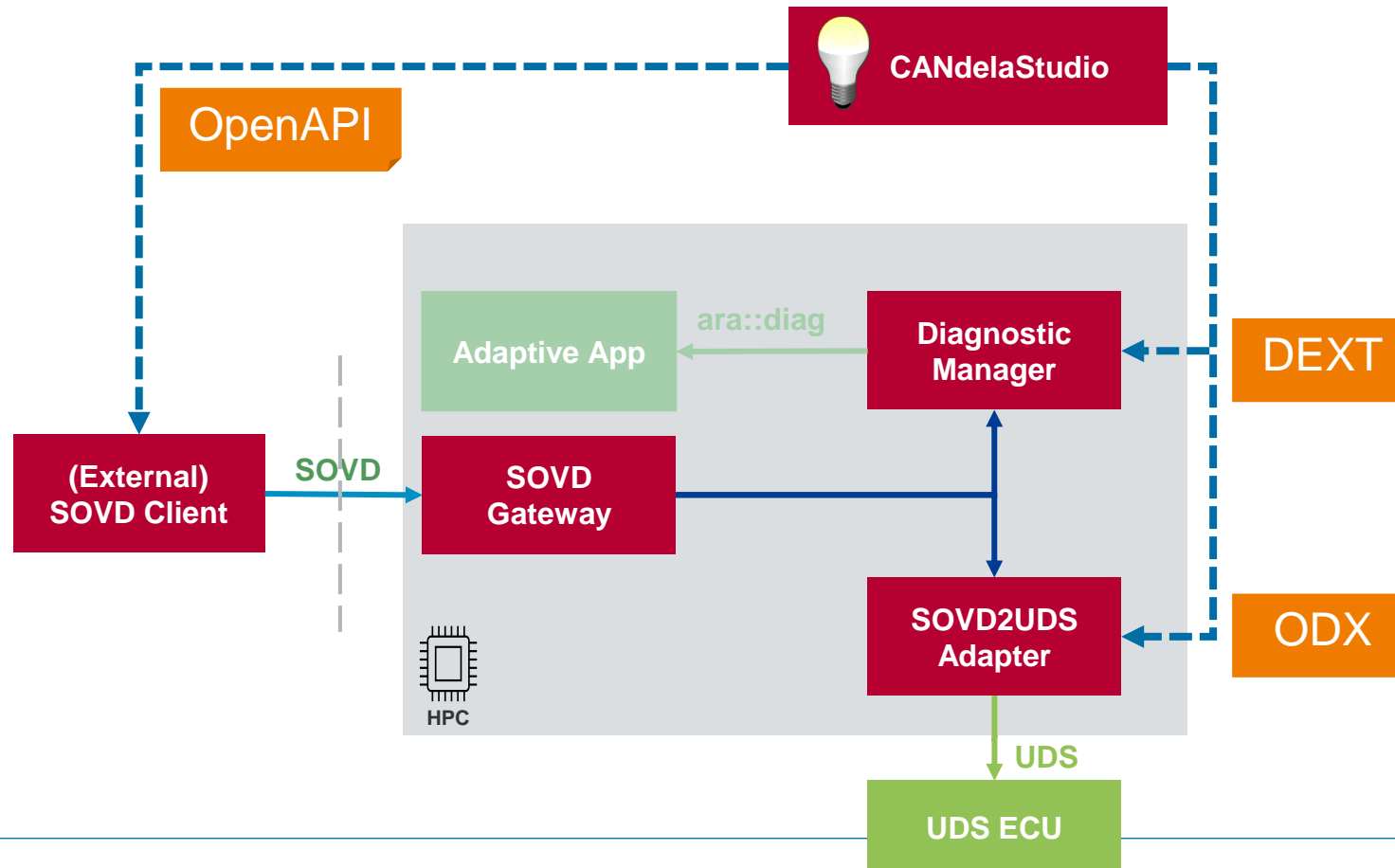
Evaluate SOVD  
with UDS based vehicles

SOVD Guided  
Evaluation project

Jointly evaluate SOVD for a  
set of ECUs

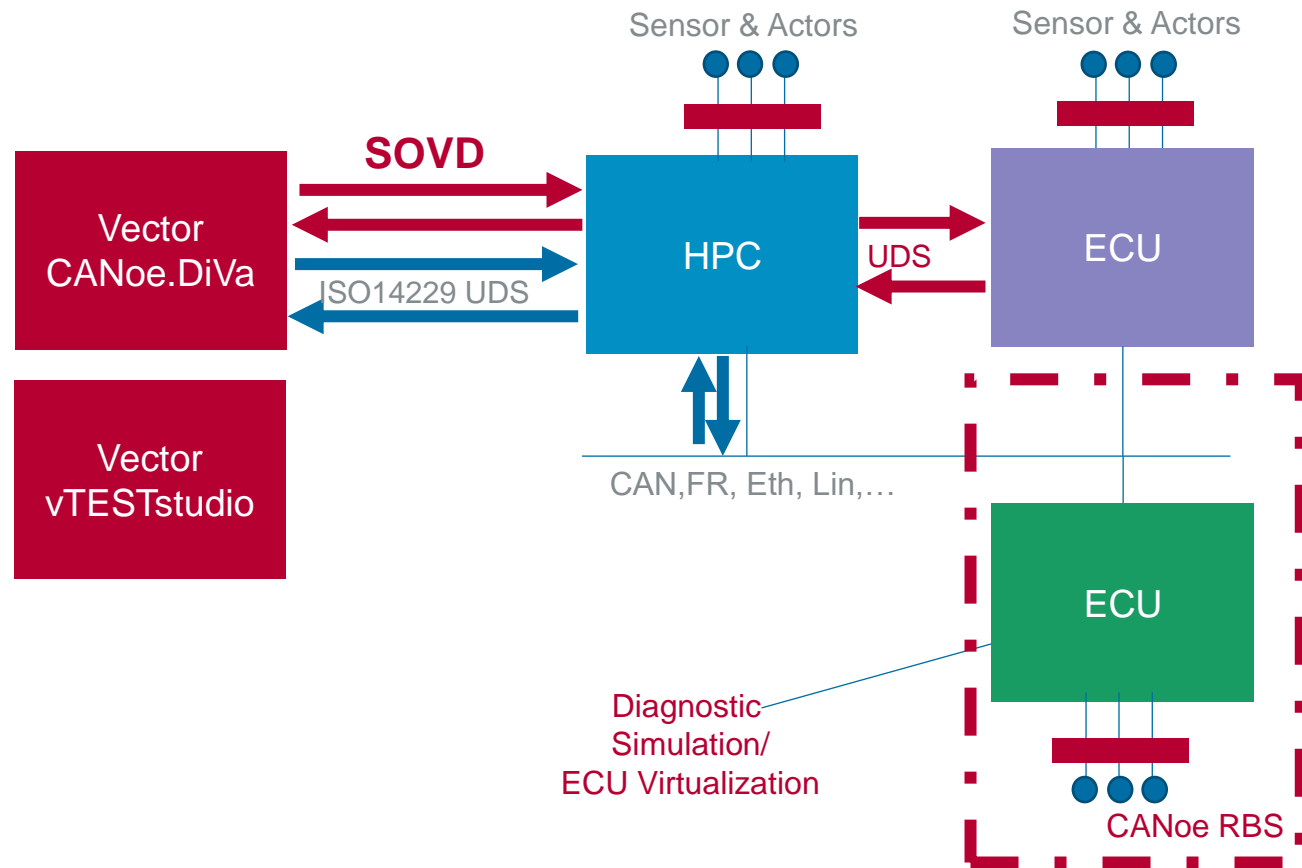
## SOVD usage scenarios – CANdelaStudio specifying SOVD

## Common Source for OpenAPI, DEXT & ODX



# Tooling

SOVD test setup – CANoe.DiVa for SOVD development



- ▶ Communication
- ▶ Completeness
- ▶ Functionality
- ▶ SW Update
- ▶ Disconnect
- ▶ Security
- ▶ Safety
- ...
- ▶ Implementation of SOVD -> UDS routing
  - consistency, data interpretation, routing, parallel access
- ▶ Self Description
  - Capability Discovery, consistency checks
- ▶ New SOVD Applications
  - Log & Trace
- ▶ ...

# Tooling

## AUTOSAR SOVD reference architecture

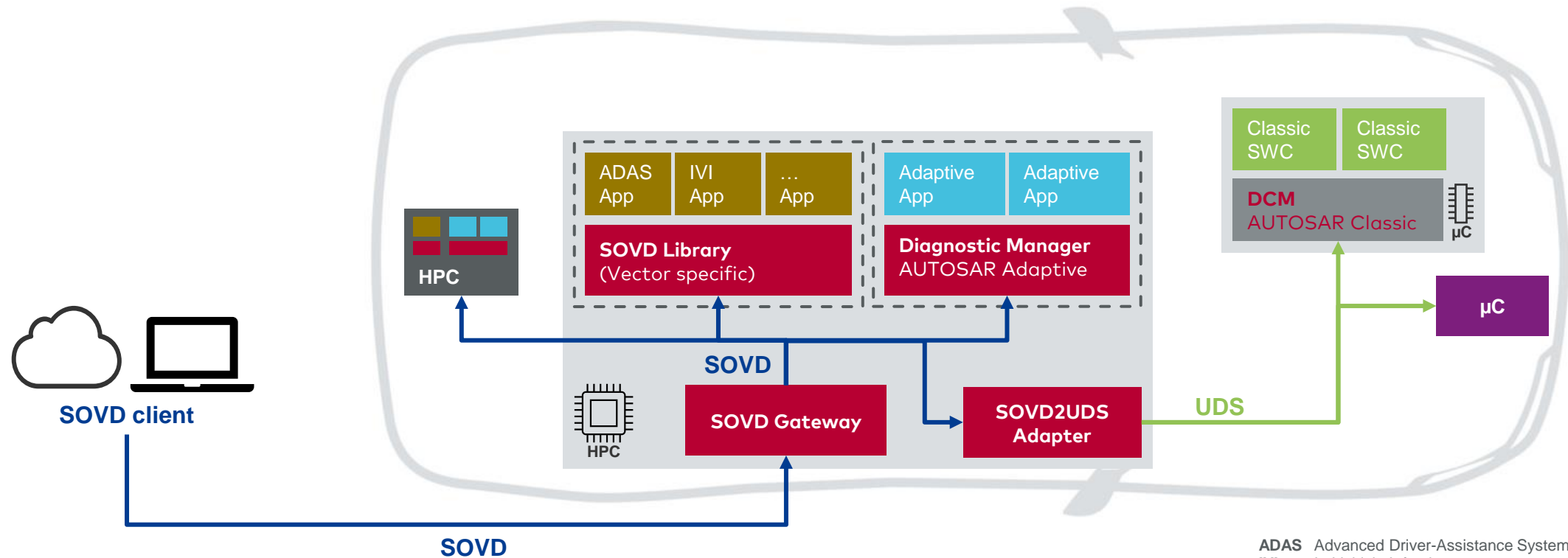
1. **SOVD Gateway**
2. **Diagnostic Manager SOVD Extension**
3. **SOVD2UDS Adapter**
4. **SOVD Library**

as **SOVD** edge node

for **AUTOSAR Adaptive** applications

for integrating **MICROSAR** or **generic** UDS ECUs

for **Non-AUTOSAR** applications



**ADAS** Advanced Driver-Assistance Systems  
**IVI** In-Vehicle Infotainment  
**UDS** Unified Diagnostic Services (ISO 14229-1)



# Tooling

Vector portfolio

## Authoring

Specify the SOVD API  
of your vehicle

## Diagnostic & SW-Update Clients

Conveniently use the SOVD API  
of your vehicle

## Diagnostic Workflow

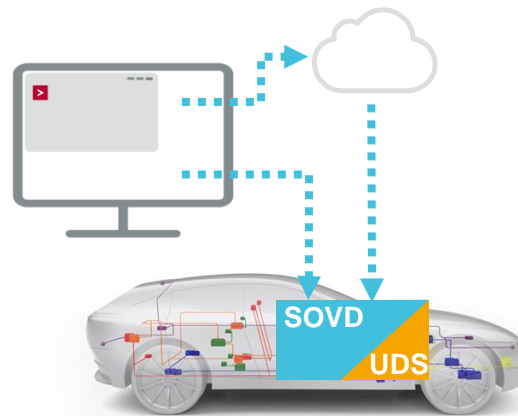
Helping you to introduce SOVD  
in your processes

## Testing

Testing and validation of SOVD  
components in development

## In-Vehicle Implementation

Implement SOVD  
in your vehicle



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