SOVD – Service Oriented Vehicle Diagnostics

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Association for Standardization of Automation and Measuring Systems

Agenda

1	Motivation
2	The SOVD API
3	Access to Classic Diagnostics
4	The Standardization Project



Motivation

HPCs, multiple apps, multiple virtualized OS

Functional contribution of Apps, ECUs and Backend

Seamless integration of UDS based diagnostic Backend

SW-Update changes to installation



Vehicle functionality enhance by OTA updates

Development continues after SOP





Motivation

Why not UDS?

- UDS is still the choice for classic ECUs but will not cover all requirements of future systems
- Not designed to be flexible, Requires static description of content ٠
- Data required for diagnosing SW-based systems does really fit to todays UDS ٠ (byte-) based world
 - Read and filter accumulated and structured logs & traces
 - Read faults and crashes with environment data like stack traces
 - Install and remove apps, Update software
 - Represent and interact with the complex SW structure in the vehicle
 - Apps will typically provide their interfaces already using • standard IT-technology (e.g. http/REST and JSON)





Motivation

What would happen if we do nothing?



Scope of ASAM SOVD

The key task of diagnostics remains

- The key task of diagnostic is to provide a uniform interface to essential data for analyzing and maintaining (ECU) software and hardware throughout development, production and service
- Diagnostic has to be put in place already during development
 - Even more for next generation SW architectures where development does not end with SOP

SOVD API (Next Generation Diagnostics)

No implementation

Remote

- SOTA
- Backend evaluation
- Fleet management
- Remote assistance (also on roadside)
- Activation on functionality as paid by costumer

Proximity

- Workshop / Service
- Manufacturing (e.g. EOL)
- Emission check and ePTI

In-Vehicle

- Monitoring (sporadic errors)
- Predictive maintenance
- Health status access

Identical service for all access possibilities

Content transferred to ISO

Use Case Overview

- Usage of Key Value pairs (Identifier [e.g. type], Value [e.g. structure])
- Data on physical level
- Data contain SI unit
- Provider language en_GB (translation key for client application can be delivered)
- Data looks service independent
 equal

Data evaluation is task of the Consumer !

REST-ish Approach based on HTTP2, TCP/IP, URI and JSON

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Service Meta Template as Base for Service Template

Method:

GET/<entity path>/data/<ResourceName>

Methode description: (described as OpenAPI spec)

Request Header:

Query Parameter:

Parameter Name	Data Type	Convention	Description

Response Body:

Attribute	Data Type	Convention	Description

Basic principle:

- value corresponds with the data type description (xsd schema) and
- value contains simple and complex types (array, structure, union)

Classic Diagnostic Adapter

Easy migration between classical and web-based access

Encapsulation of classical

- Stateful communication
- Signal based communication •
- Usage of diagnostic protocols (e.g. UDS) •
- e.g. an Internal MVCI System

Classic Diagnostic Adapter

VECTOR **ASAM**

AUT@SAR Classic Platform

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management

HPC Diagnostics

UDS, UDS on REST, SOVD

- Static Offline description necessary for interpretation
- High degree of automotive specific stack in each diagnostic client
- Changes to the network Matrix required for adding new entities 1 Adress = 1 Entity
- Adress range for content is "limited"

- Automotive specific stack is centralized
 - Only a small stack on clientside
- API based on physical values
 - No need for an offline description for using the API
- Usage of state-of-the-art technology for security / data transfer and data representation

- Uniform API for accessing Classic / Adaptive and non-AUTOSAR entities in the vehicle
- Possibility to represent the complex SW-Structures in an HPC / the vehicle
- No limitation with respect to addressing and Identifiers

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Schedule

ASAM SOVD Project

 SOVD is the largest group in ASAM apart from simulation (19 participating companies)

Achievements

- Technology decisions mainly fixed
 - REST on HTTP2.0 using JSON structured data, usage of Server-Sent Events for event-based communication
 - OAuth based concept for Authorization
- SOVD API
 - Structure of the API almost fixed
 - Requirements for Services fixed

Participants

OEM's and Tier 1

- BMW
- Daimler
- Porsche
- Audi
- Ford
- GM
- Volvo
- Volkswagen
- Continental
- Bosch
- ZF

Tool Supplier

- DSA
- Softing
- KPIT
- Siemens
- Vector
- RA Consulting
- Tata consultancy
- Luxoft

Thank you for your attention!

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