ASAM SOVD v1.0
Release Presentation

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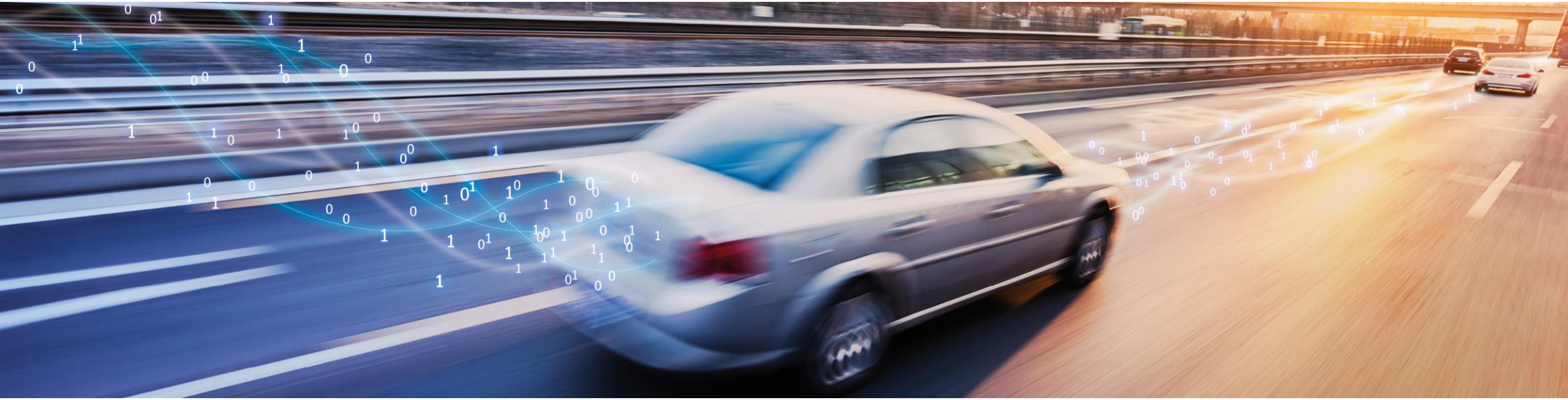

ASAM Association for Standardization of Automation and Measuring Systems

Agenda

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3	New Features
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Introduction

New architectures based on HPCs, multiple OS, the different applications and their dependencies put a major challenge also to diagnostics.

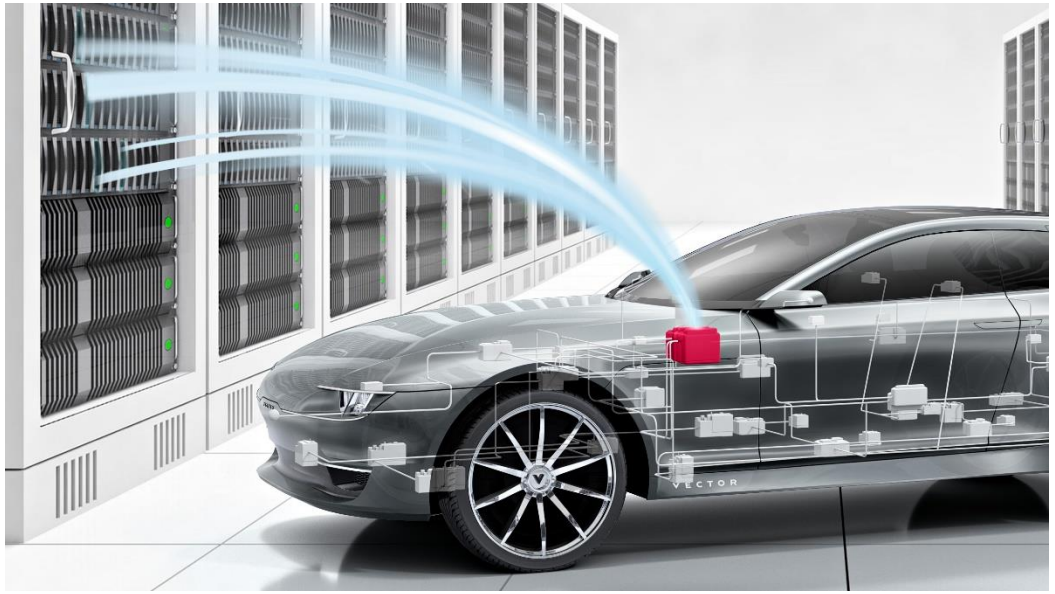
Focus extends from identifying hardware errors to analyzing software issues.

SW-analysis requires different type of data

- Logs, traces, process information, stack traces

Diagnostic content in the vehicles will change dynamically, this contrasts with the static approach of UDS.

SW-update will change from transferring individual bits and bytes to controlling a complex update procedure in the vehicle.



Motivation

- SOVD provides a new API for diagnostics
- Usable in application scenarios Remote, Proximity and In-vehicle
- Based on state-of-the-art IT-technologies (HTTP, REST, JSON, OAuth)
- Diagnostic is independent from diagnostic data description files possible
- Whole computation is encapsulated, and a stateless access is possible
- Client Implementation requires no automotive specific stack

New Features

Overview

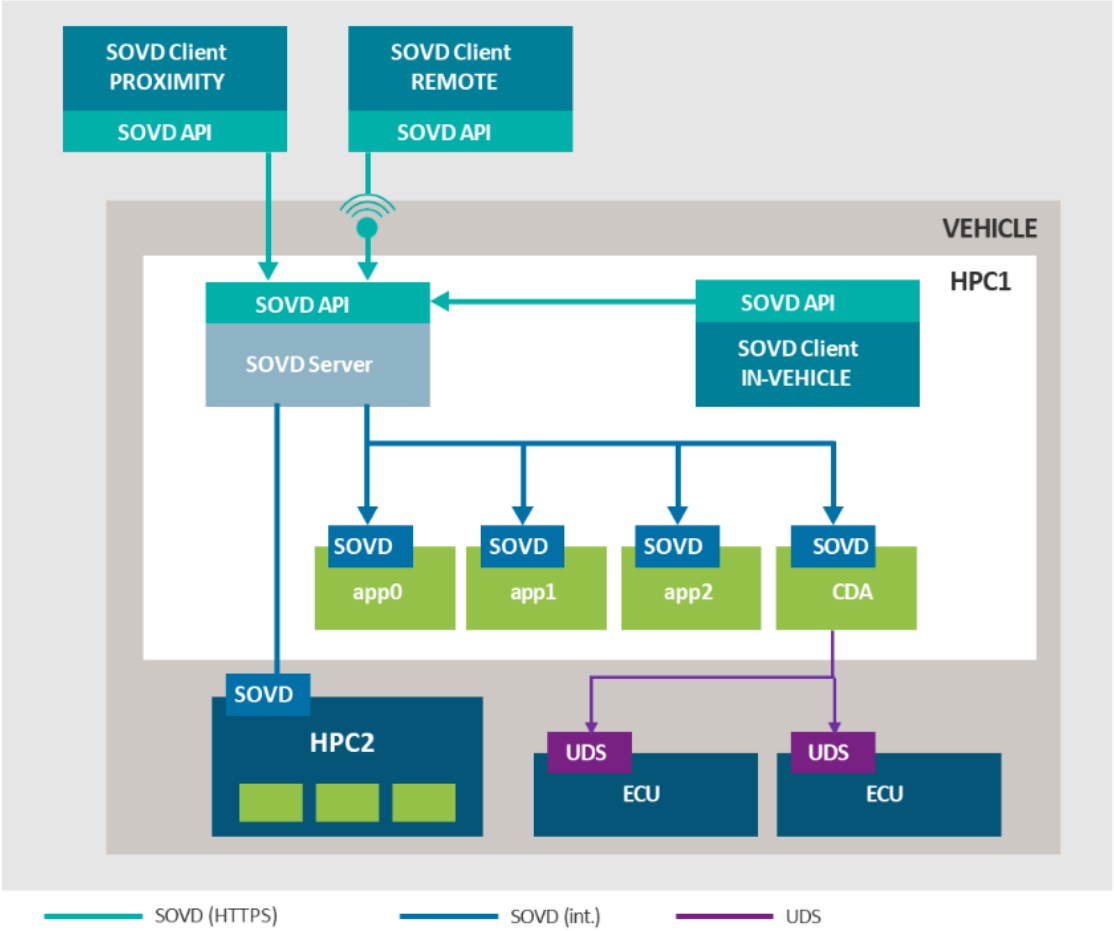
SOVD covers traditional use-cases

- Data access
- Fault information
- Control of internal SW-functions

SOVD covers HPC related diagnostic use-cases

- Vehicle SW-update
- Logging
- Access to system information
- Dynamic discovery of content

- SOVD encapsulates UDS but does not replace it

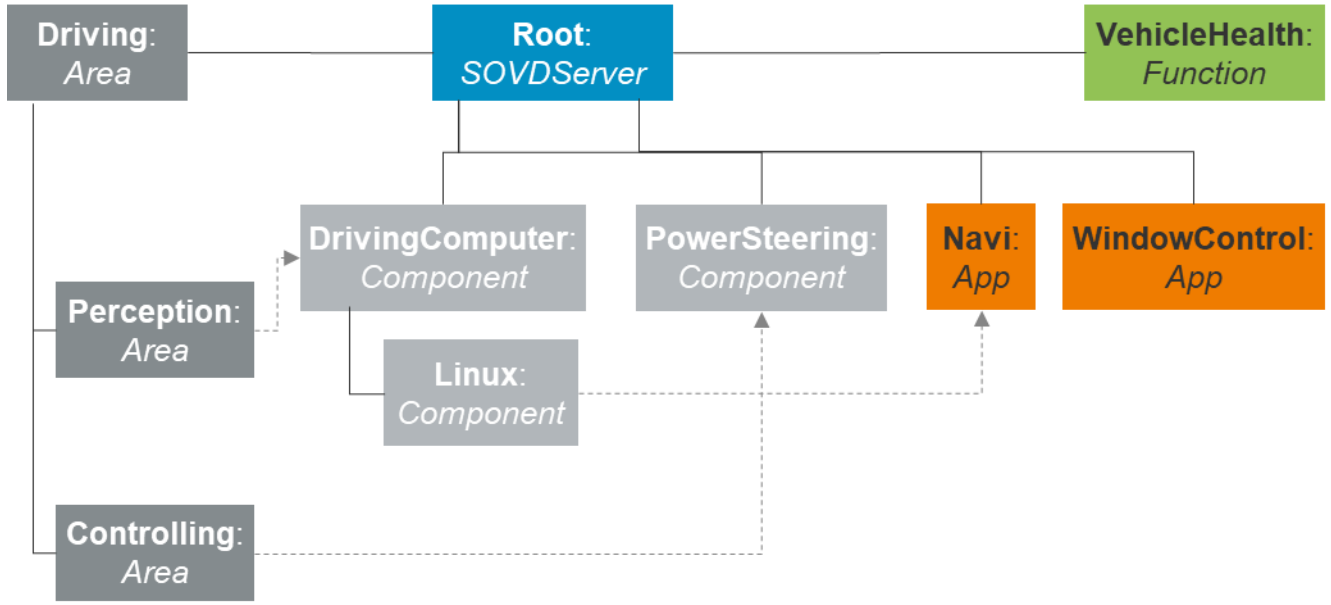


New Features

Capability Discovery

Discovering of entities and resources

- Discovery of contained entities
- Query sub-entities of an entity
- Query related entities of an entity
- Query entity capabilities
- Areas represent a topological view on the entities, capable to represent both domain and zone-oriented architectures



Access to capability description content

- Query an online capability description
- Query schema information for content processing

New Features

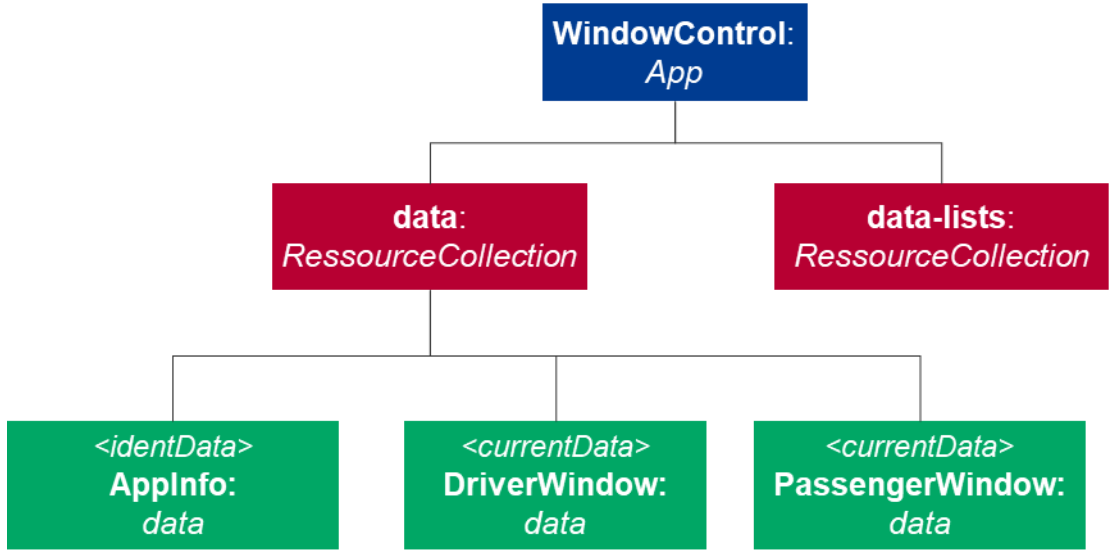
Data Resource Read / Write Access

Methods

- Retrieve the list of data available for an entity
- Data is categorized according to its semantic
  - E.g. currentData, identData, storedData, sysInfo
- Read/write access to data
- Possibilities to group data

- Possibilities to create aggregated data sets on entity level

- Periodic / Trigger Based data access is planned for v1.1



New Features

Fault Handling

Methods

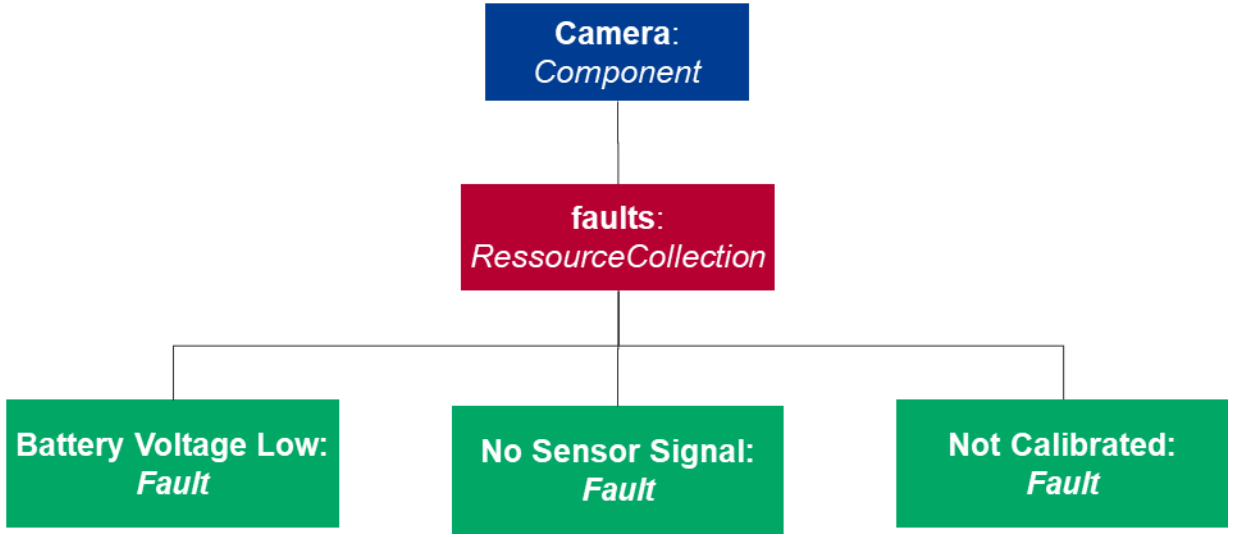
- Read faults from an entity
- Read details for a fault
- Delete all faults of an entity
- Delete single fault of an entity

Query parameters

- Status, based on key value pair
- Severity

Access to environment data for a single fault code

- OEM specific key value pairs

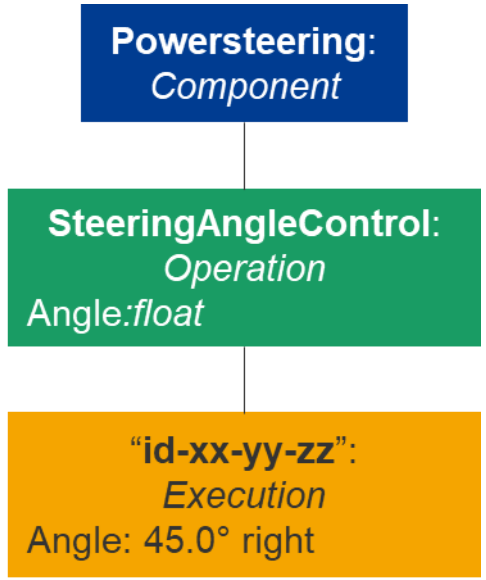


New Features

Control of Operations

Operations (SW-internal functions, actuators)

- List available operations
- Initiate the execution (potentially multiple)
- Monitor the status, adjust the execution
- Terminate the execution
- Support for synchronous and asynchronous execution

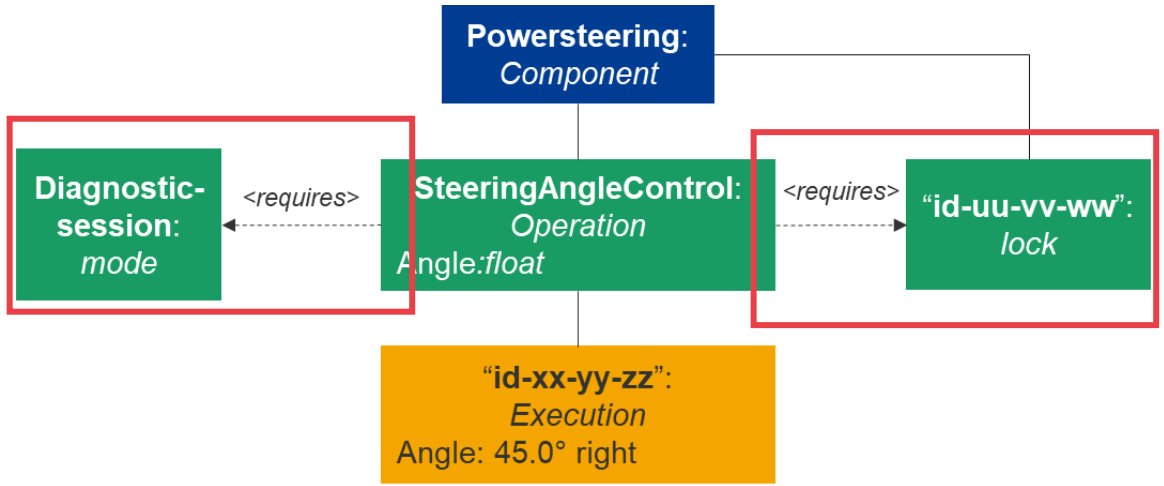


New Features

Control of Target Modes / Parallel Access to Resources

By design, REST is a stateless protocol and therefore also provides parallel access to resources.

Yet the vehicle behind the SOVD API is not always stateless with support for parallel access.



Target modes

- Retrieve list of all supported modes of an entity
- Explicit control of entity states via their defined modes

Locking

- Goal: avoid parallel usage of entities in certain sequences
- Acquire a lock on an entity
- Release an acquired lock on an entity

New Features

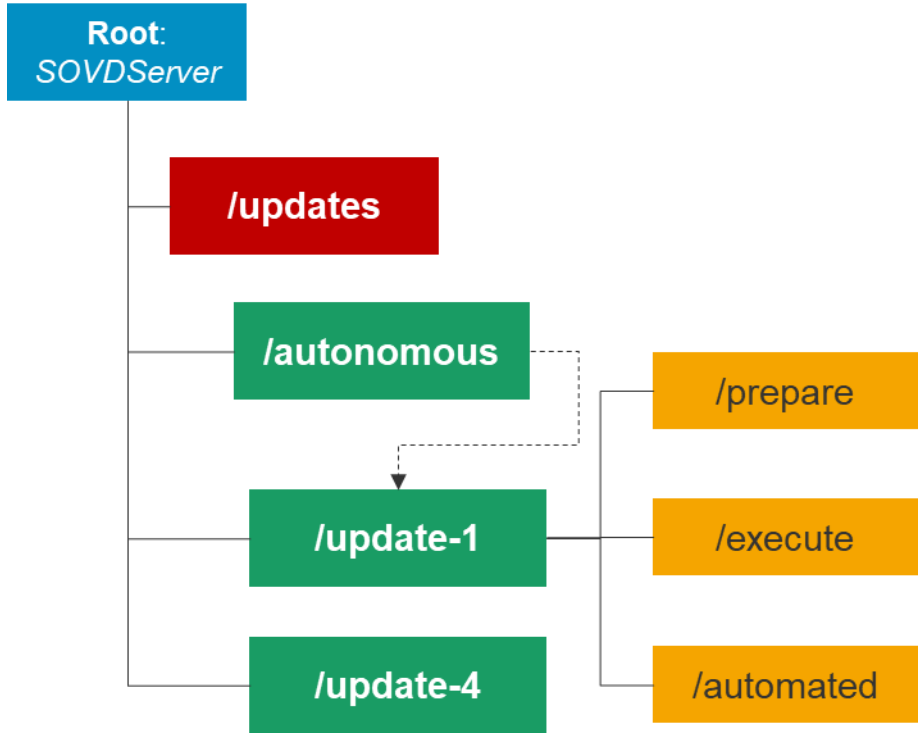
Software Update

Basics

- It is assumed that there is a central component in the vehicle which performs the software update
- ASAM SOVD provides an API to trigger this central software update component
- Update procedure itself is not subject to ASAM SOVD

Methods

- Retrieve list of all updates provided by the entity
- Get details of update
- Automated installation of an update
- Prepare installation of an update
- Execute installation of an update
- Get status of an update
- Delete update package from a SOVD server
- Register an update at the SOVD server



New Features

Logging

Basics

- Access to aggregated log information
- Evaluation by software experts
- Transport as bulk-data possible

Methods

- Retrieve list of all log information
- Configure SOVD logging
- Retrieve the current SOVD logging configuration
- Reset SOVD Logging configuration to default

Supported Context Types

- RFC 5424 (syslog protocol)
- AUTOSAR diagnostic log and trace

Request:

```
HTTP GET
{base_uri}/components/DrivingComputer/logs/entries
```

Response:

```
HTTP 200 OK
{
  "items": [
    {
      "timestamp": "2021-07-20T00:00:04.387819Z",
      "context":
      {
        "type": "RFC5424",
        "host": "Linux",
        "process": "systemd",
        "pid": 1
      },
      "severity": "info",
      "msg": "Closed D-Bus User Message Bus Socket",
    },
    {
      …
    }
```

Relation to Other Standards

- The API follows the REST principles (*R. T. Fielding; "REST: Architectural Styles and the Design of Network-based Software Architectures," PhD dissertation, University of California, Irvine, 2000*)
- It uses JSON (IETF RFC 8259) for encoding the transmitted data.
- SOVD is designed to work with HTTP/1.1 (IETF RFC 2616) but for achieving the best communication performance HTTP/2 (IETF RFC 7540) is recommended
- The SOVD API utilizes the OpenAPI (OpenAPI Specification v3.1.0) specification to define the API as well as the diagnostic capabilities of the vehicle.
- The authentication and authorization of clients builds upon OpenID Connect and OAuth 2.0 (IETF RFC 8693, IETF RFC 6749 and IETF RFC 6750)
- ASAM data types are mapped to JSON types.

Deliverables

Documents

- ASAM_SOVD_BS_V1-0-0.pdf

Supplementary Files

- OpenAPI definition of the standard (as yaml files)