



DENSO

Crafting the Core

ISO Extended Vehicle (ExVe)

**COVESA All Member Meeting –
Cloud and Connected Services (CCS)**

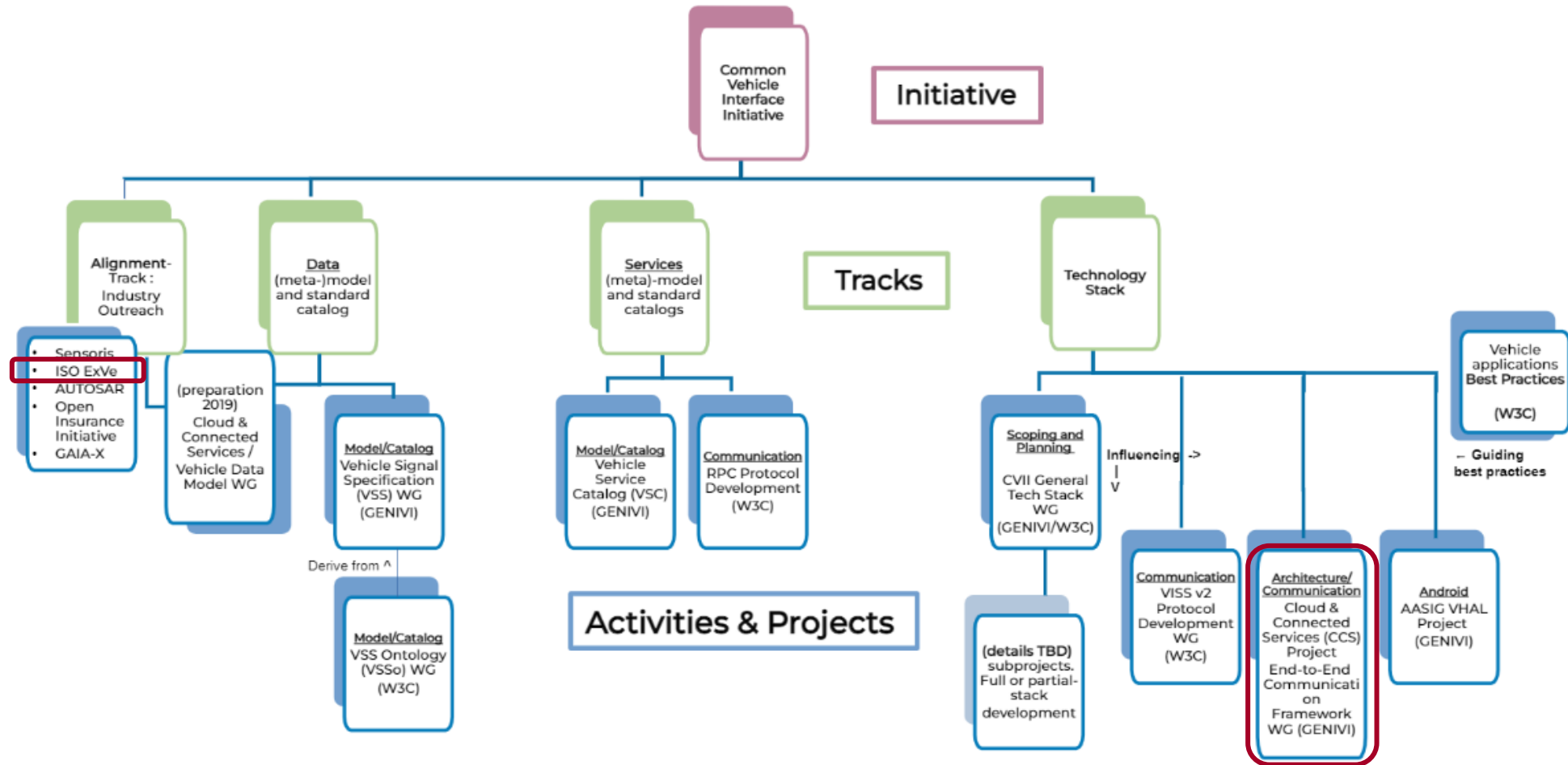
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ISO ExVe within GENVI CVII

- Same vision: Support multi-brand services with independent vehicle data descriptions



Source: GENIVI Alliance

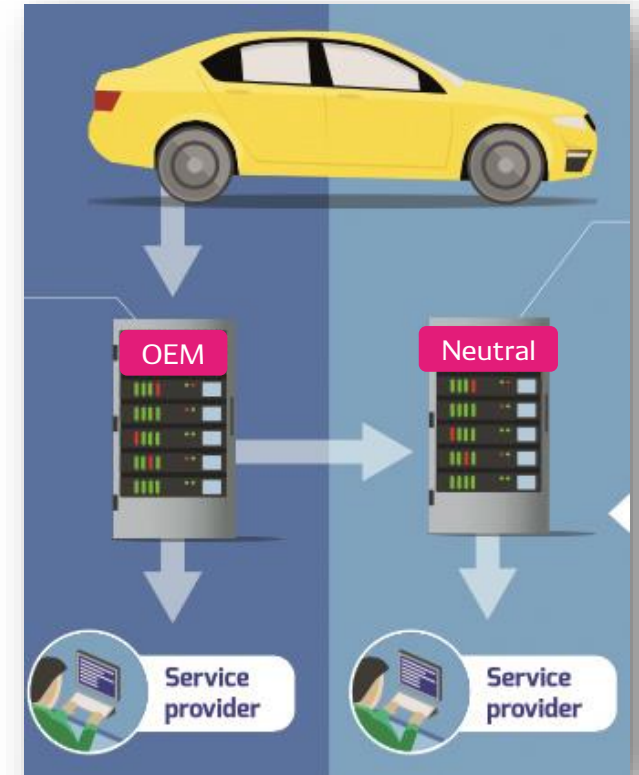
Extended Vehicle (ExVe)

In scope

- providing a system design, guidelines and requirements to allow external parties retrieval of OEM vehicle data through web services
- ... and theoretically other interfaces, e.g. OBD, FMS, ExVe time critical I/F
- supporting data access to registered, authenticated and authorized parties
- server based API

Out scope

- specific hardware system
- In-vehicle data collection
- **specific vehicle data set, data model or data ontology**



Source: <https://www.cardatafacts.eu/vehicle-data-available-service-providers/>

Players on the pitch

* Active members in ISO 20078 2nd Ed. highlighted



Necessity for an open and standardized access to an in-vehicle data approach is recognized beyond all major OEM & Tier-1



Implementations

Mercedes-Benz /developers

Experimental Connected Vehicle API 1.0

Tryout URL: <https://api.mercedes-b...>
 Production URL: <https://api.merced...>

An experimental Connected Vehicle API that... simulator.

Schemes: HTTPS

Overview, Details, Specification, Docs

Why choose

When you choose to work with HIGH MOBILITY you are working with developers who know where you're coming from.

Become part of an engaged community

We are car data pioneers
 We're the team who first built connected car apps for Jaguar Land Rover and Fiat Chrysler Group and has been an innovation partner for many others. Now it's your turn to work with us!

BMW GROUP THE NEXT 100 YEARS

Innovation

HOW CAR DATA WORKS.

ZIP ARCHIVE
 B2B INTERFACE

BMW GROUP DATA CENTER

Ford Dev

Home > Ford Connected Vehicle API

Early Access to Ford Connected Vehicle APIs Offered to FordDev Community!

FordDev is excited to announce the availability of the first Ford Connected Vehicle APIs to our global community. These APIs will allow developers to integrate remotely with Ford and Lincoln connected vehicles directly through the embedded modem.

These new APIs are a tremendous step forward in the evolution of the Ford Connected Vehicle ecosystem. Ford has enabled developers to connect drivers when they're in the vehicle through the use of our popular Applink APIs (built on the open source SDL platform) since 2013, and now we're adding the ability to access the vehicle remotely to create features and experiences beyond the vehicle and into the daily lives of Ford owners.

CARUSO dataplace

HOME SUCCESS STORIES PRICING DEVELOPER ZONE ABOUT & CONTACT

MARKETPLACE LOG IN

otonomo

Guides API Reference Log In

v1.1 > Guides > Otonomo Full Attributes List

Increasing number of ExVe-APIs by OEMs and service providers are available

(Not all examples provided will be fully ISO 20078-compliant)

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Discover everything you need to know about our simplified and powerful API, how we protect personal data, which data items we offer, and how to consume our data. Check out our [Developer Portal](#) to integrate in-vehicle data into your solutions. In case you have any questions, we would be happy to hear from you.



Audi

Alte Modelle Elektromobilität Beratung & Kauf Service & Zubehör Audi Welt

Extended Vehicle Data

Überblick Fahrzeugnutzer Serviceprovider Onboarding Guide Nutzungsbedingungen

API GUIDES

Attribute names are determined according to three tiers:

1. *Category* – the frame of reference. For example: Vehicle, Mobility, Environment, Driver
2. *Element* – a component of the category. For example: Engine (in the Vehicle category), Speed (in the Mobility category)
3. *Specific* – a description of the element. For example: Temperature (of the Engine), Average (of the Speed)

Each data attribute is a unique trio, separated by two underscores ("_").

Some examples:
 Vehicle_Engine_Temperature - The current temperature of the vehicle's engine
 Environment_External_Temperature - The current air temperature level outside of the vehicle (ODB-II-PID:46) in Celsius.
 Mobility_Speed_Value - The vehicle's current speed in Km/h (ODB-II-PID:0D)

Categories description

category	description
vehicle	Current status of the vehicle parts
mobility	Vehicle movement characteristics. e.g speed, acceleration
metadata	data about our data. e.g the time a data point was sampled
manufacturer	manufacturer specifications. e.g make, model, year, recommended tire pressure
location	Location data, e.g longitude, altitude
maintenance	current maintenance issues. e.g DTCs, time to next service

ISO 20078 Overview

20078-1: ExVe **Content** (terms and definitions, resource types, overview protocol stack)

20078-2: ExVe **Access** (HTTP, URLs, REST)

20078-3: ExVe **Security** (roles, OAuth 2.0/OpenID connect)

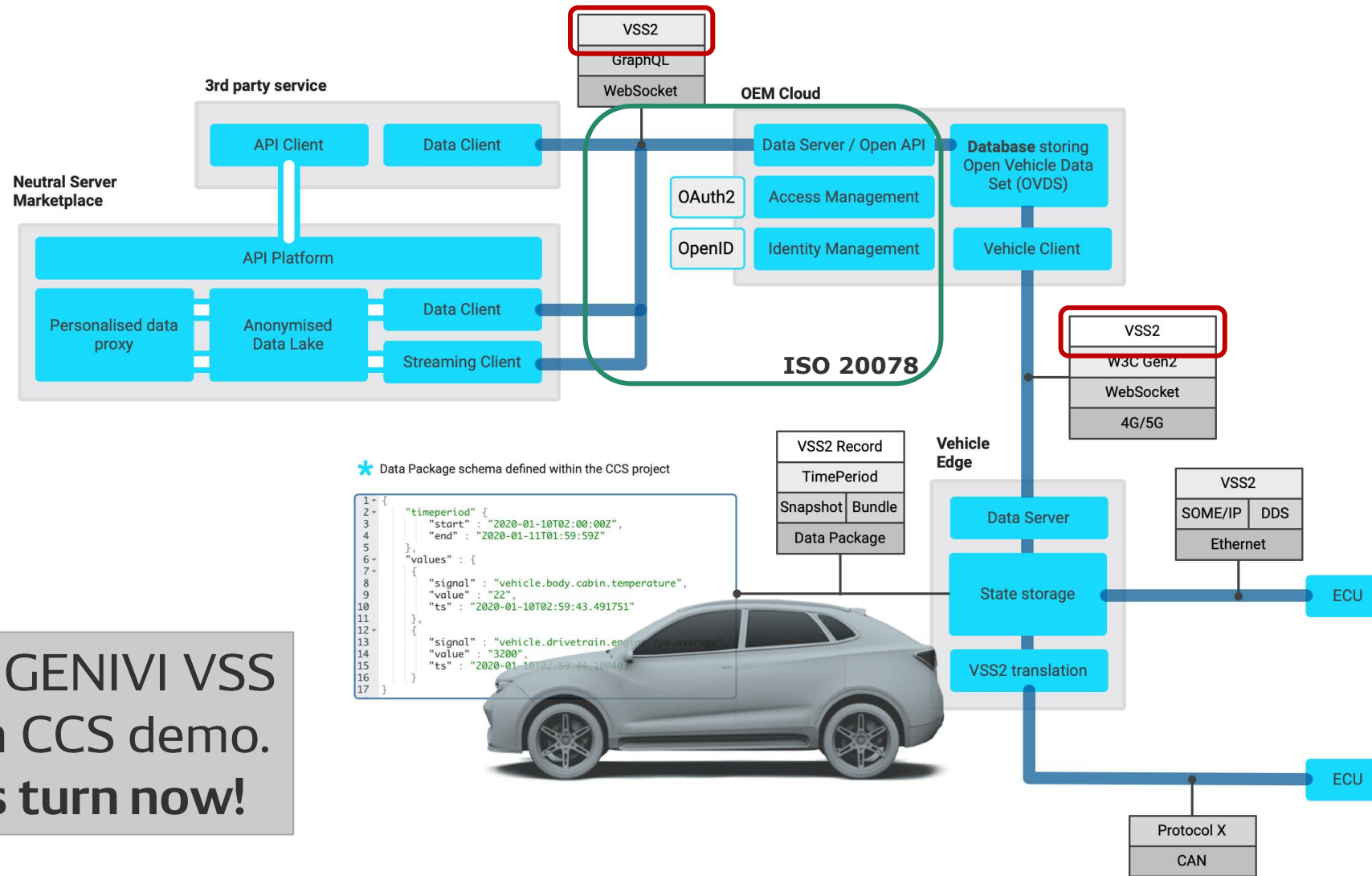
20078-4: ExVe **Control** (preconditions and logical processes)

ISO 20078 technology stack

Transport Protocol	HTTP 1.1 (or later version) over TLS 1.2 (or later version)
Service Design	RESTful
Data format	JSON (recommended)
	XML
Authorization	OAuth 2.0 (or later version) compatible framework
End User Authentication	An OpenID Connect 1.0 (or later version) compatible framework

Source: ISO 20078-1

GENIVI Cloud & Connected Services framework



Usage of GENIVI VSS proven in CCS demo. It's ISOs turn now!

ISO ExVe and GENIVI VSS

Ideal: Integration of VSS spec (*.yaml OR *.json, *.graphql, ...)

Option: Extend the ExVe web interface with a reference to VSS through tagging or mapping

Tagging (inside JSON body)

- „vehicleId“ : {„value“:„WDB96340310150924“, „ref“:„VSS.VehicleIdentification.VIN“}

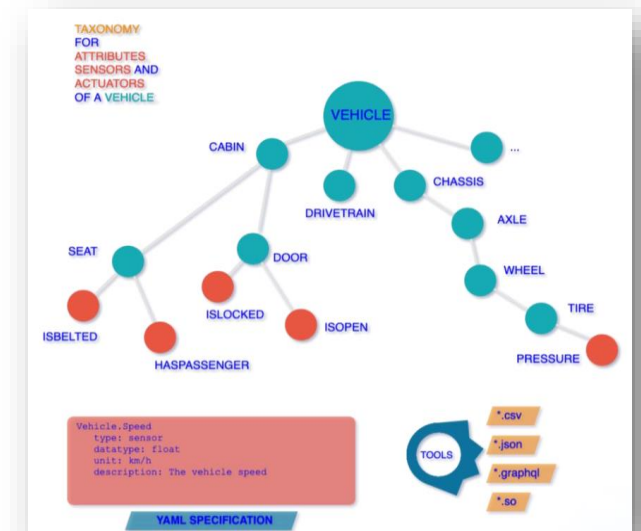
Mapping (outside JSON body)

- „vehicleId“ : {„value“:„WDB96340310150924“}
- „VSS.VehicleIdentification.VIN“ : „vehicleId“

ISO ExVe: Our quest for a data model

- ISO ExVe does not provide a useable data model – **yet?**
- ISO TC22/SC31/WG6 informal sub-group “data and functions description”
- Scope: Development and integration of a common data model / data description & potentially data catalog
- ISO requirements
 - *Data structure* → relationship between data items
 - *Data types* → reference vs. event vs. stream; actuator vs. sensor; ...
 - *Meta data* → description; units; precision; ...
 - Machine processable; adaptable

Covered by GENIVI VSS?



Add-on: EU regulation on In-Vehicle data upcoming?

- EU Commission started investigation on the necessity of a regulation for access to in-vehicle data
- Inception impact assessment ongoing (Target: EoY21)
- First draft planned for Q2/2022
- Discussed measures include
 1. Availability of data and functions catalogue ?
 2. Standardization of data and functions ✗
 3. Minimum functions and minimum dataset(s) ✗
 4. ...

European Commission

Log in English Search

Law

In-vehicle generated data – EU rules for services based on access to car data

Have your say > Published initiatives > In-vehicle generated data – EU rules for services based on access to car data

In preparation

UPCOMING

Roadmap

FEEDBACK: UPCOMING

Public consultation

Consultation period
Third quarter 2021

FEEDBACK: UPCOMING

Commission adoption

Planned for
Second quarter 2022

FEEDBACK: UPCOMING

About this initiative

Summary

Modern vehicles have features that allow a wide range of data that they generate when driving to be collected.

This initiative sets the conditions for accessing and using such in-vehicle generated data. It aims to enable clear and competition-friendly EU rules for services that are based on access to car data, for example:

- repair and maintenance
- car sharing
- mobility as a service
- insurance.

Topic
Single market

Type of act
Proposal for a regulation

Roadmap

FEEDBACK: UPCOMING

Type
Inception impact assessment
[More about roadmaps](#)

Have your say!

[EU rules for services based on access to car data \(europa.eu\)](#)



- Standardized data & functions
- Common service catalog

• Future regulation?



- CVII
- Standardization
- Industry consortia

DENSO

Crafting the Core