W3C Automotive WG Activities

Next generation specification and VSS

Benjamin Klotz, BMW GROUP | 2 May 2019

GENIVI®

W3C Automotive Working Group

W3C Automotive community: Presentation

Goal: "Bring drivers and passengers a rich Web experience"

W3C Automotive and Web platform business Group (BG)

https://www.w3.org/community/autowebplatform/

- Started in 2013
- ~150 participants
- Big Data task force: doing a gap analysis and work on solutions for the remaining components
- Chairs: Paul Boyes (Invited Expert), Ted Guild (MIT, W3C), WonSuk Lee (ETRI)

W3C Automotive Working Group (WG)

https://www.w3.org/auto/charter-2018

- Started in 2015
- ~80 participants
- Working to make vehicle server and API specifications
- Chairs: Paul Boyes (Invited Expert), Rudolf Streif (Jaguar Land Rover), Patrick Luennemann (Volkswagen)

GENIVI®

W3C Automotive WG in 2018

**A) W3C Vehicle Information Service Specification (VISS)**

Specification of message protocol to provide vehicle information
Use WebSocket as information transport and JSON as message format
(in future, other communication method could potentially employed. e.g.HTTP)
Methods: get, set, subscribe, authenticate, getMetadata, etc.
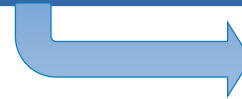
Candidate Recommendation [1]

B) W3C Vehicle Information API Specification (VIAS)

Specification to provide JavaScript API for user's convenience.
Primarily, supposed to implement as JavaScript wrapper library.
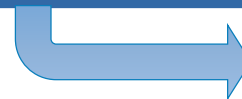
Relegated as Note [2]

C) GENIVI Vehicle Signal Specification (VSS)

Vehicle data model. For compatibility, refer GENIVI's specification.

[1] https://www.w3.org/TR/vehicle-information-service/
[2] https://www.w3.org/TR/vehicle-information-api/

Vehicle signal specification (VSS) in 2018

Attribute
- Weight

Signal
- Raindetection → Intensity

Signal entries
- Type: UInt8
- Unit: percent
- Description: "..."
- Value: restriction or free

Signal/Attribute:
- Body
- ADAS
- Cabin
- Chassis
- Drivetrain
- OBD
- Vehicle
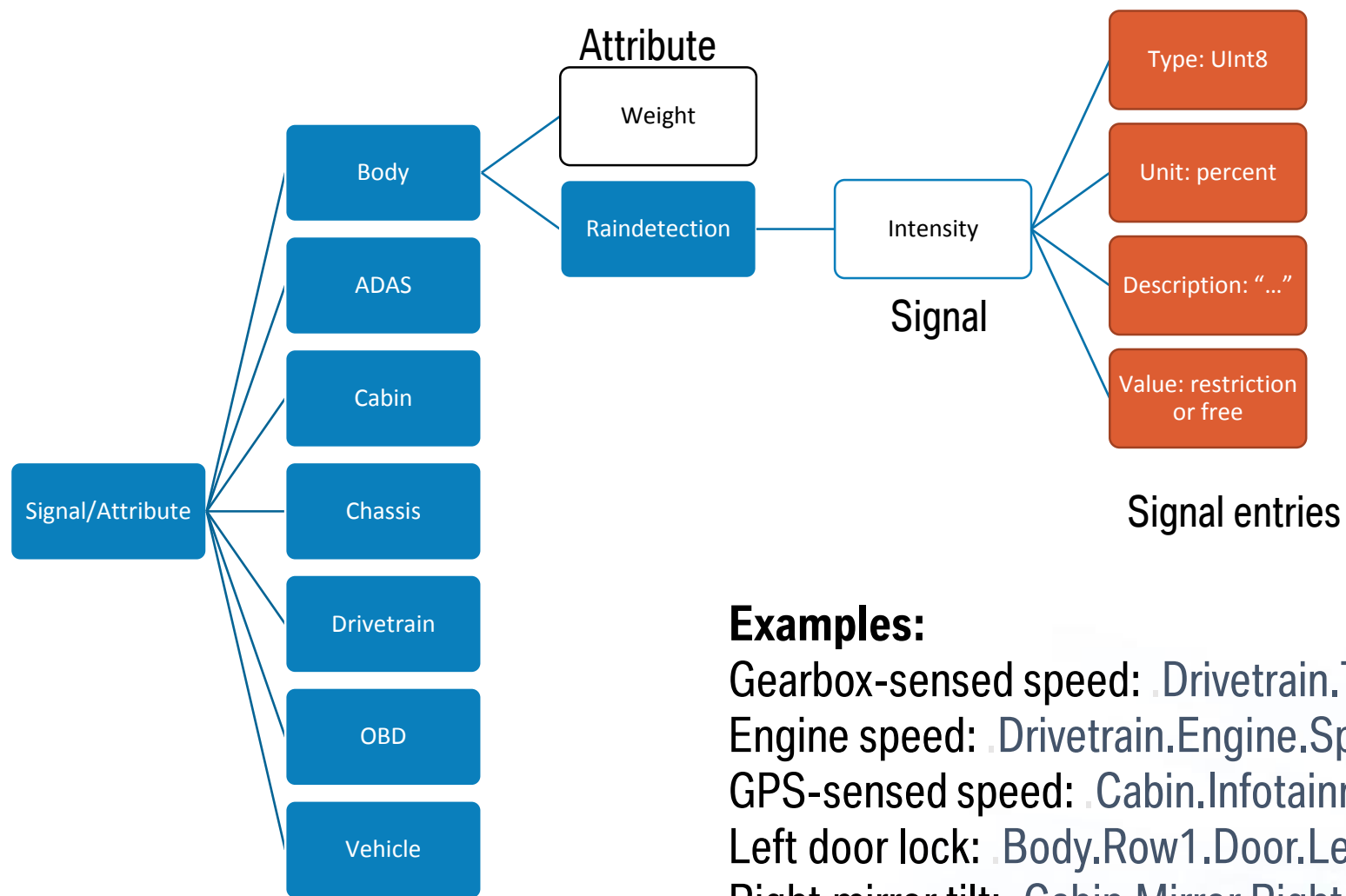
Figure:

- **451 branches**

- **1103 leaves:**
  - 43 attributes
  - 1060 signals: including
    - (700 seat-related),
    - 268 with unit

Examples:
Gearbox-sensed speed: .Drivetrain.Transmission.Speed
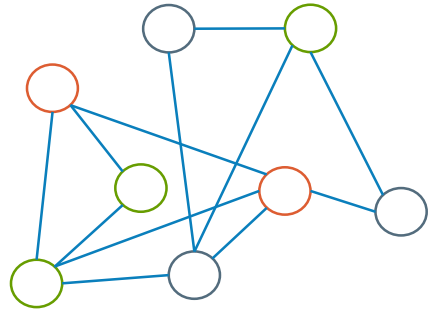Engine speed: .Drivetrain.Engine.Speed
GPS-sensed speed: .Cabin.Infotainment.Speed
Left door lock: .Body.Row1.Door.Left.IsLocked
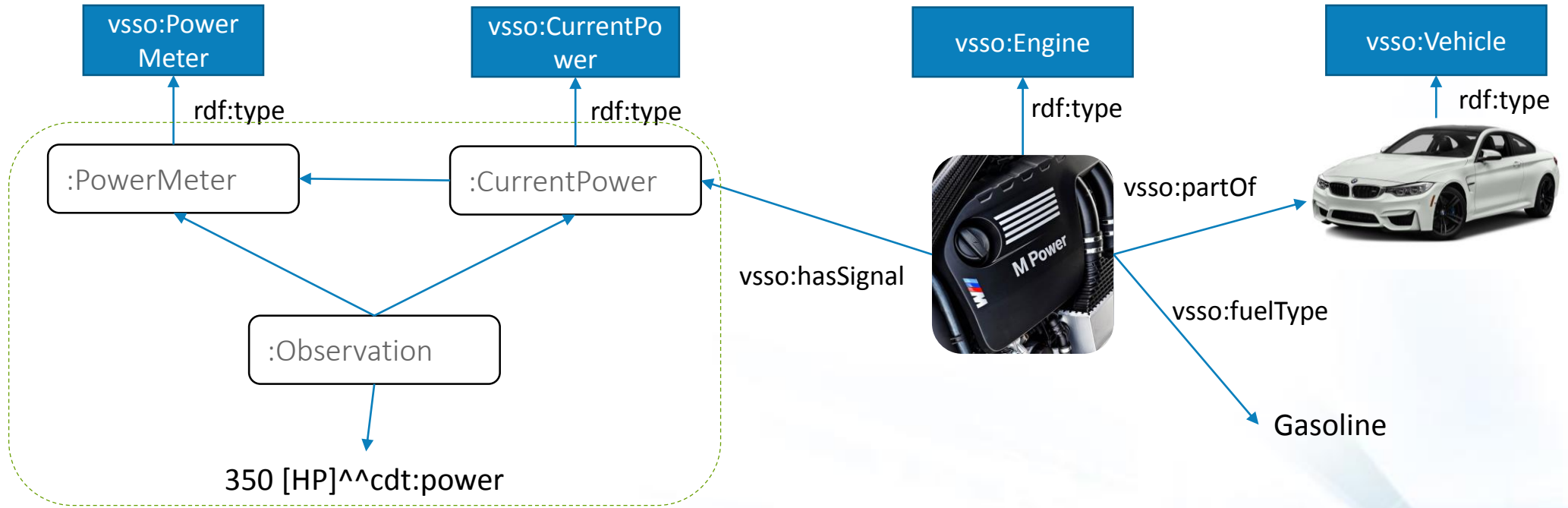Right mirror tilt: .Cabin.Mirror.Right.Tilt

Recent updates

VSSo: VSS ontology [3]

Graph representation of formal models of:

- Vehicles and their branches
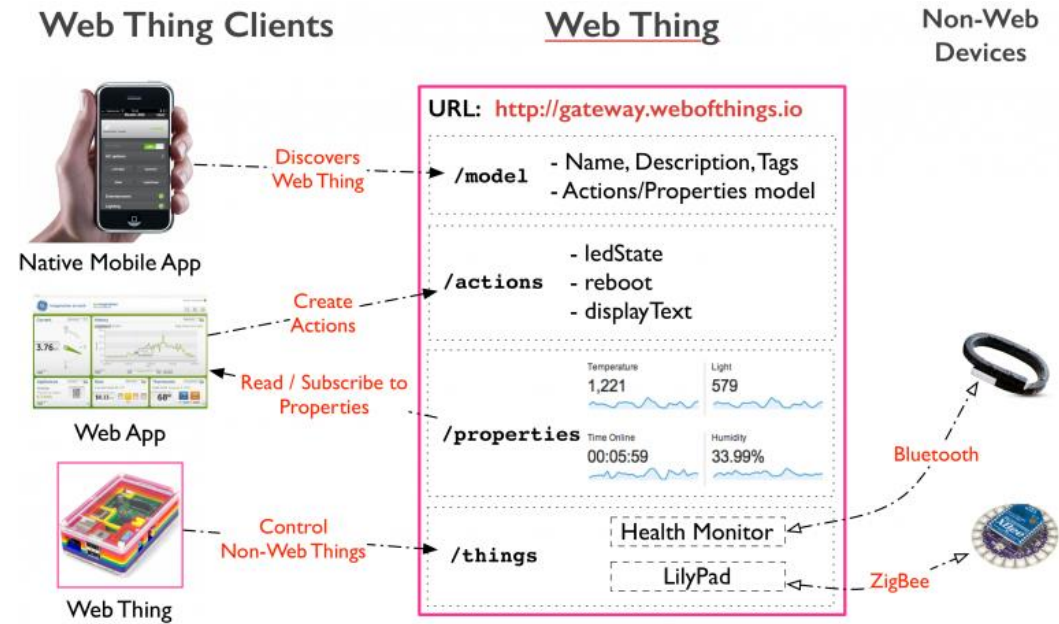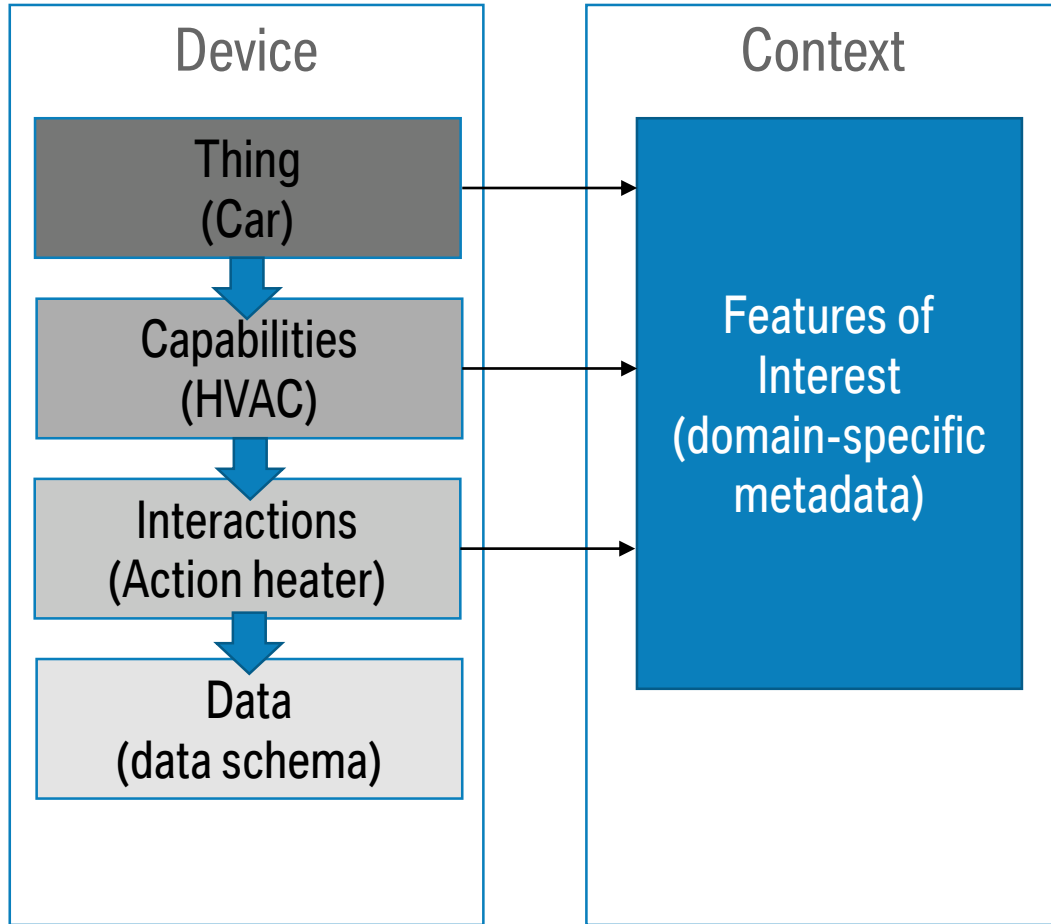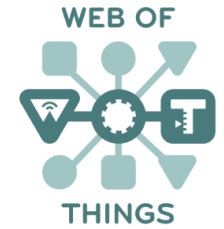- Sensors, actuators, signals and attributes

SOSA pattern [4]:
- Sensor,
- Observation,
- Sample,
- Actuator

[3] http://automotive.eurecom.fr/vsso
[4] https://www.w3.org/TR/vocab-ssn/

Usage in the Web of Things [5]

Device

Thing (Car)
↓
Capabilities (HVAC)
↓
Interactions (Action heater)
↓
Data (data schema)

Context

Features of Interest (domain-specific metadata)

Web Thing Clients — **Web Thing** — Non-Web Devices

Native Mobile App

Discovers Web Thing

Create Actions

Read / Subscribe to Properties

Web App

Control Non-Web Things

Web Thing

URL: http://gateway.webofthings.io

/model — Name, Description, Tags — Actions/Properties model

/actions — ledState — reboot — displayText

/properties
Temperature 1,221 — Light 579
Time Online 00:05:59 — Humidity 33.99%

/things — Health Monitor — LilyPad

Bluetooth

ZigBee

Source: Building the Web of Things: book.webofthings.io
Creative Commons Attribution 4.0

[5] https://www.w3.org/WoT/

Next generation vehicle server specification

Charter from May 2018 to June 2020:

➡ Specify a next generation vehicle server: "Gen2"
- Separated transport and API
- Protocols: both HTTP(S) and WebSocket
- Service-oriented
- RESTful
- Data model: VSS2

Drafting specs [6] ➡ not yet at a First Public Working Draft.
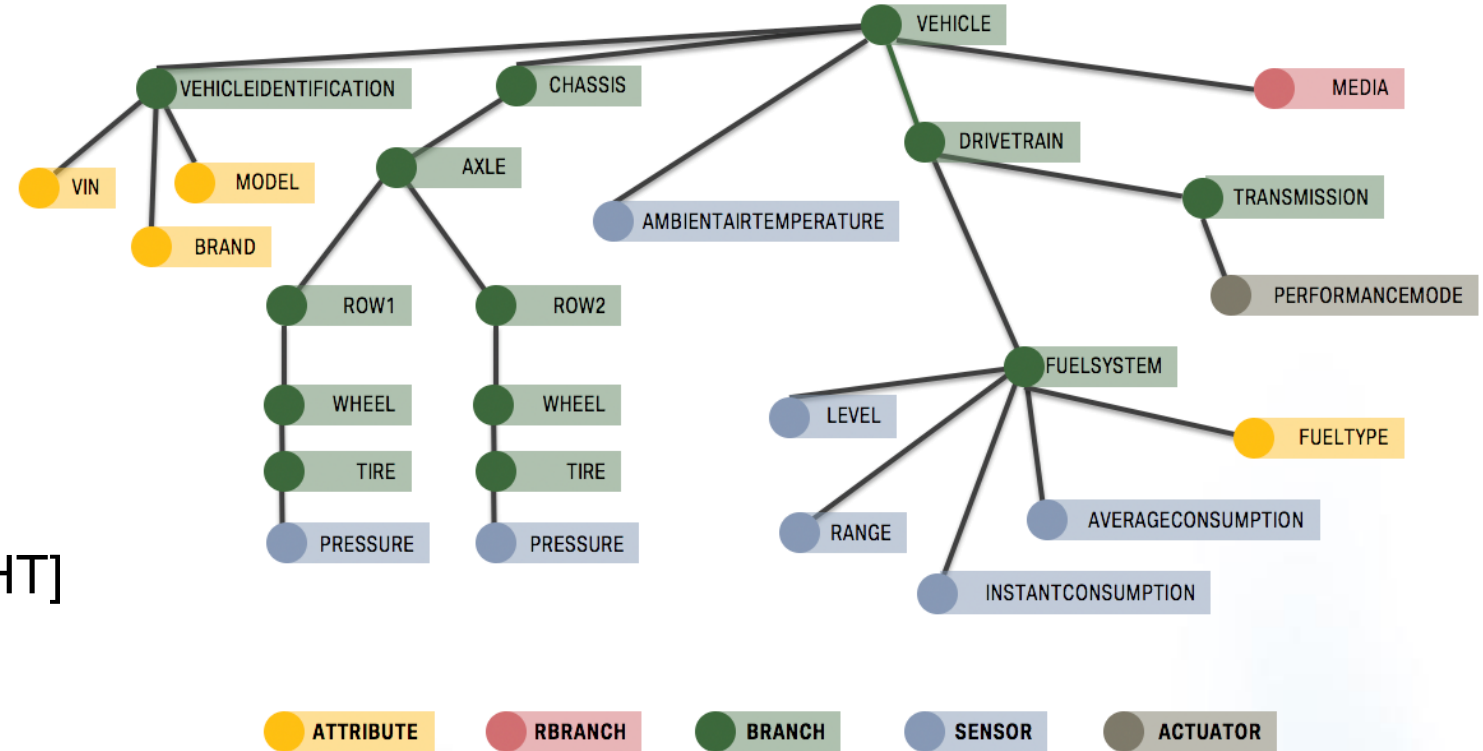
Open source implementation [7]
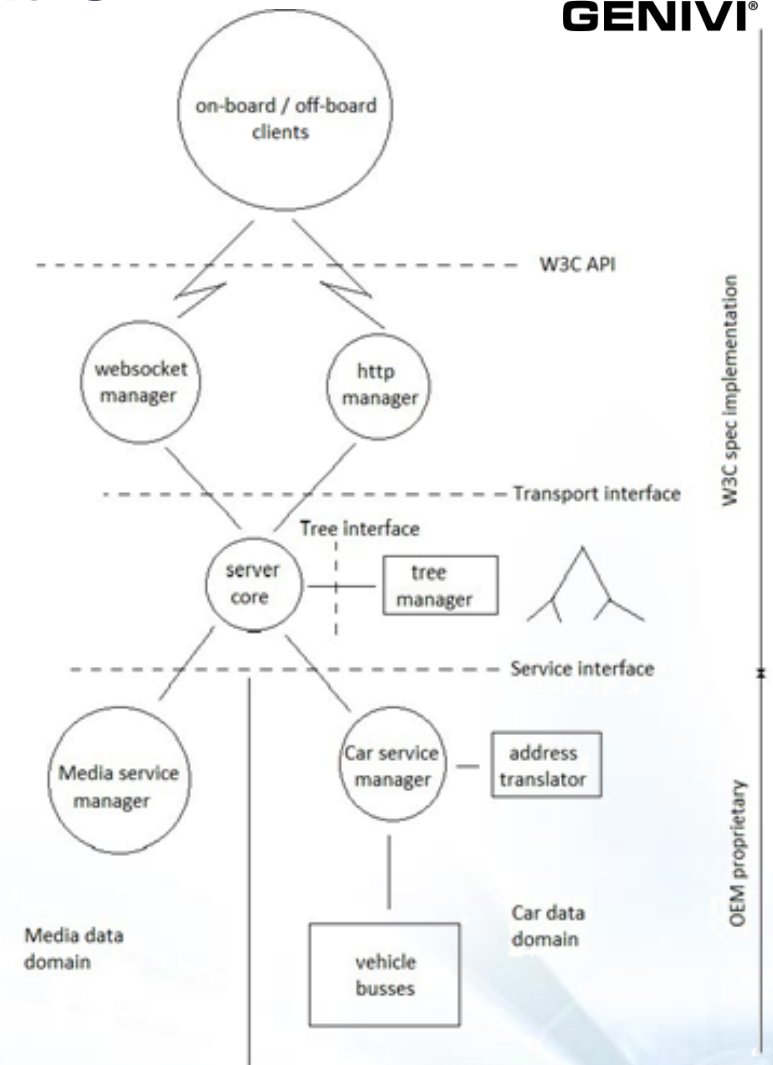
[6] https://github.com/w3c/automotive/tree/gh-pages/spec
[7] https://github.com/MEAE-GOT/W3C_VehicleSignalInterfaceImpl

VSS 2.0

- A unified tree combining:
  - Static attributes
  - Sensors
  - Actuators
- Simpler position models:
  - Observe wheels in Row[1,2]
  - Get window position in [LEFT,RIGHT]
- Rbranch:
  - Resource branch
  - Adapted for collections

Conclusion

Goal: "Bring drivers and passengers a rich Web experience"

- VISS on the path to be a recommendation

- VSS as a common specification for GENIVI and the W3C

- Good practices from the Web of Things

- Next generation vehicle server in development

- Open source implementation

- New version of VSS adapted for the next generation of automotive services

GENIVI®

Thank you!

Visit GENIVI:

http://www.genivi.org

http://projects.genivi.org

Contact us:

help@genivi.org

GENIVI®