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)
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

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`
- 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

[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
- Native Mobile App
- Web App
- Web Thing

Web Thing
- URL: http://gateway.webofthings.io
- /model1
  - Name, Description, Tags
  - Actions/Properties model
- /properties
  - temperature 1.2°C
  - humidity 53.99%
- /actions
  - ledState
  - reboot
  - displayText
- /things
- Health Monitor
- LilyPad

Non-Web Devices
- Bluetooth
- ZigBee

Source: Building the Web of Things book, webofthings.io
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[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


Open source implementation [7]

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
Thank you!

Visit GENIVI:
http://www.genivi.org
http://projects.genivi.org

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