ASAM Telematics Standards

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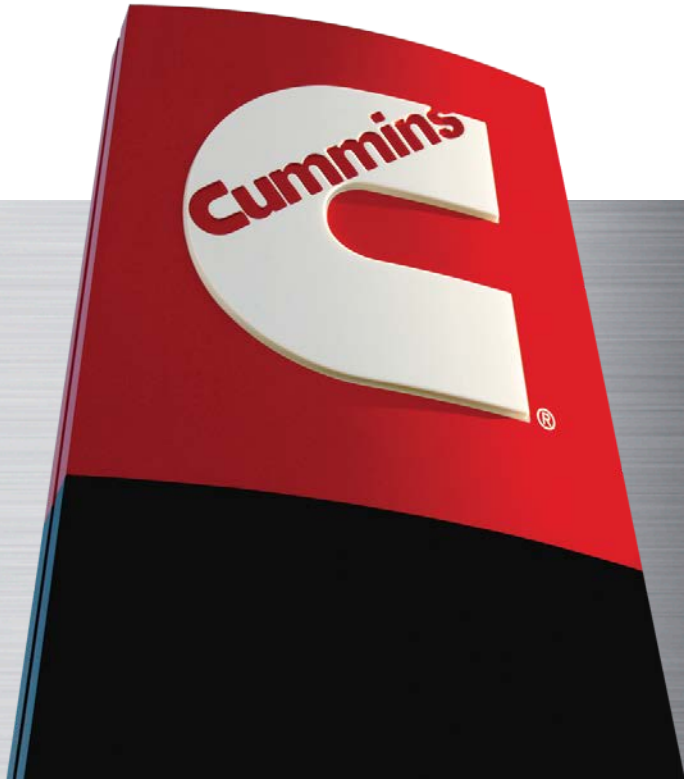
March 8th, 2017



Agenda

- Initial Scope
- Return on Investment
- Problem Example
- First Steps with ASAM
- Status of Two Ideation Groups
- Future plans and needs
- Board view on Telematics

Definition of "Telematics"

~~Active Safety (V2V)~~

~~Infotainment (V2Device)~~

~~Payment Systems (V2X)~~

~~Insurance (V2X)~~

~~Wireless technologies~~

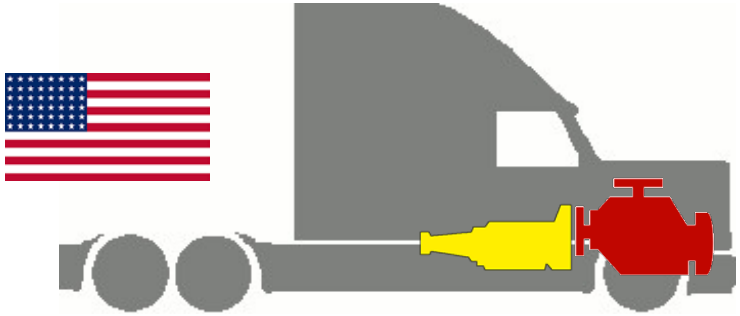
~~Fleet Management (V2I)~~

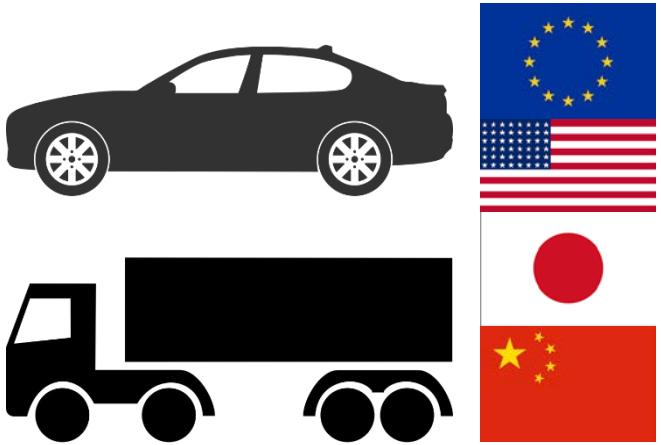
~~Car Sharing (V2I)~~

~~Automated Driving (V2X)~~

~~Improved Traffic Flow (V2X)~~

~~Improved Worksite Organization (V2X)~~





IN SCOPE

GPS / Satellite / Mobile Communications

Manufacturer 2, 3, …
Vehicle Telematics Terminal

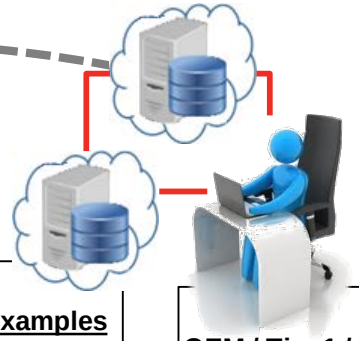
Manufacturer 1:
Vehicle Telematics Terminal

Vehicle network

Body Control Modules
- Behavior
- Diagnostics
- Performance Control
- Safety & Security Control
- …

Trans Control Modules
- Behavior
- Diagnostics
- Performance Control
- Safety & Security Control
- …

Engine Control Modules
- Behavior
- Diagnostics
- Fuel Control
- Performance Control
- Safety & Security Control
- …



Fleet Management Examples
- Route management
- Operator support
- Operator training
- Fleet management services
- …

OEM / Tier 1 / TSP Examples
- Monitor performance
- Monitor fuel economy
- Monitor health
- Diagnose problems
- Firmware updates
- Remote troubleshooting
- Adjust customer settings
- Fleet management services
- …

2 way communication ✓	**Definition of protocols and exchanges methods** ✓	**Not a definition of the data itself** ✗

Return on Investment

Efficient, secure data exchange between vehicle, device, and cloud

- Investment efficiency
- Faster cycle time – initial and ongoing
- Enable best OEM and Tier 1/2 capabilities
- Consistent UX
- Foundation for the future of SaaS
- Customer confidence in system-level security
- While protecting proprietary data and intellectual property

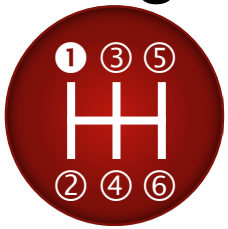
Why ASAM?

- Existing ASAM standards related to data gathering and data exchange
  - ASAM Standards need to be extended for telematics and secure data exchange
- Proven record of success
- The ASAM Community is the right size for fast development
- The ASAM Community has the right technical focus and alignment with the industry
- International support and structure

Problem Statement Example – Remote Firmware Update

- Deliver consistent user experience while performing remote firmware update on multiple smart devices (control modules), provided by different suppliers, in a vehicle network.
- Why does the problem exist?
  - No standard for the smart / control modules
  - Multiple telematics providers (US commercial vehicles case?)
    - OEMs, 3rd party providers and/or custom solutions for mixed fleets
    - No standard for the telematics hardware and user interface
- Possible solutions
  - Develop proprietary methods and require all suppliers to comply
    - Requires long lead time any time new supplier is introduced
  - Develop an industry standard
    - Need to ensure non-competitive scope

Progress history



March 31, 2016

- Cummins and ASAM co-sponsor an exploratory workshop with OEMs and Tier 1/2 suppliers about telematics data exchange standards

- Primary Goal: Evaluate if OEMs and Tier1/2 providers are interested in standardization in the telematics space
  - Explore common non-competitive use cases and document opportunities where collaboration in standardization would reduce cycle time, manpower, or costs
  - Enable consistent user experience while protecting proprietary data and intellectual property
  - Gather problem statements from the participants
  - Start with top 3 problem statements of interest

Attendees

Accenture
Allison Transmission
Bosch
Continental
Control-Tec / Delphi
Cummins Inc.
Daimler Trucks
Eaton
Navistar
PACCAR Inc.
Ricardo
SBD North America
WABCO

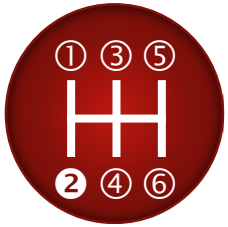
Interested non-Attendees

FEV
HHI
Komatsu
Magna
MTU
Tata Consulting

Outcome of the initial workshop

- Attendees agreed to should pursue this together and expressed interest to invest time to participate and lead efforts.
- Generated a preauthorized list of use cases
- Top 3 use cases:
  - Standard format for exchange of telematics data to enable efficient integration of backend systems and analytics
  - Standardized method for authenticating and authorizing a telematics box to communicate with a controllers
  - Remote Programming (OTA)
- Proposed establishing a steering group(s) to coordinate/prioritize the work going forward – worldwide
- Telematics service providers (TSPs) are important to the success and all required their participation.

Second Workshop



June 14, 2016

- Cummins and ASAM co-sponsor second workshop with OEMs, Tier 1/2 suppliers, and TSPs

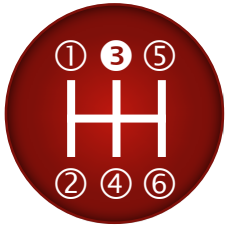
- Significant discussion and participation continued to demonstrate the need for standards and the willingness for cooperation.
  - Group proposed started with 2 projects:
  - Standardized method for authenticating and authorizing a telematics box to communicate with a controllers
  - Standard format for exchange of telematics data to enable efficient integration of backend systems and analytics

OEMs
- Daimler Trucks
- Volvo Trucks

Tier 1/2 Suppliers
- Allison Transmissions
- Continental
- Cummins Inc.
- Eaton
- Navistar
- Tata Consulting
- WABCO

TSPs
- Actia
- Geotab
- KPIT
- Omnitracs
- PeopleNet
- Zonar

Current status



- Two workgroups formed
  - Authentication and Authorization - Embedded Interface
  - Cloud Interfaces

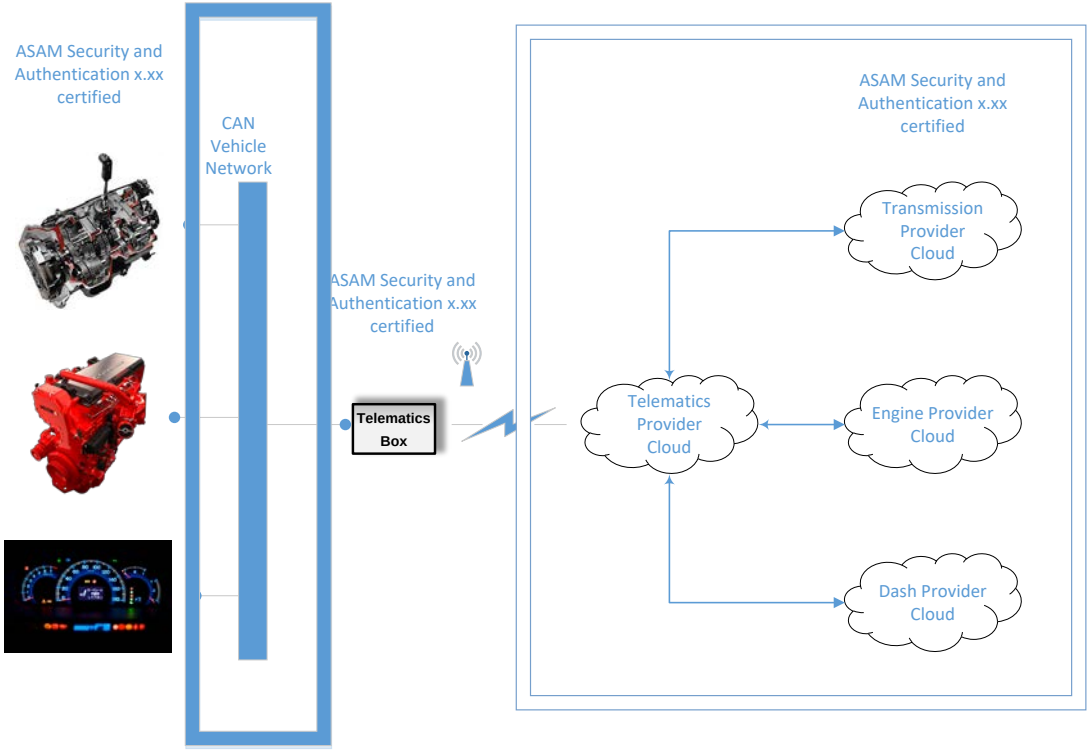
- Many meetings have taken place, approximately every other week
- Investigations into other Standard Development Efforts
- Goal: mid-May 2017: Proposal Workshop
  - Drive international participation
  - In alignment with other Standards Organizations
  - Globally meaningful and useful standards

Authentication and Authorization – Embedded Interface

Datalink interfaces to authenticate and authorize Telematics unit(s) and ECMs in a vehicle network for the exchange of manufacturer specific data

- Authenticate – Identify
- Authorize – Provide different access levels depending on credentials

Participants	
Allison Tranmission	KPIT
Bosch	Omnitracs
Cummins	TCS
Geotab - PL	Wabco
	Zonar



Cloud Interfaces

- Scope: Develop a standardized set of interfaces for telematics devices to cloud communication to enable interoperability between multiple device brands and clouds.

- Impact: Enables plug-and-play functionality between many TSPs and OEM/Tier1/Tier2s.

Participants

Bosch - PL
Cummins
Geotab

Experience to date

- Time required to align people with ASAM Process
- Time required for people to build trust
- Time consumed in developing scope and documenting use cases

- ASAM Office alerted group to similar activities in ISO/SAE Committee:
  - ISO TC22/SC31/WG2 – Authentication and Authorization of Service Tools
  - Ideation group reviewed available documentation and identified various use cases that are NOT covered
  - Additionally, Geotab met with Mark Zachos (SAE, DGTechnologies)
    - Confirmation that the uses cases identified were indeed not covered
    - Confirmed that ISO TC22/SC31/WG2 did not want to address these additional use case
  - Direction: ASAM workgroup is to proceed with their original vision
    - Where possible collaborate with SAE and ISO workgroups

Future plans and needs

- Drive OEM participation
- Invite regions to review the list of use cases (“the charter”)
  - Do the use cases apply to EU, Asia …?
  - Are there other use cases to be added to the priority list
- Coordinate the activities between regions
- Investigate activities in ISO TC22/SC31/WG6 (Extended Vehicle) and ISO 204 Secure Vehicle Interface

Board view on Telematics

- New domain for ASAM – incorporating best of CAT and AE
  - Opportunity for integration of new systems with existing tools
- Beginning new domains is difficult
  - New experts, not experienced with ASAM processes or expectations
  - Must drive support from management levels to technical levels
  - Must have clear business reasons for driving efforts in an existing consortium
  - Participants must not only be technical experts, but also understand activities in other global Standard Development Organizations
- Impact on ASAM infrastructure and processes
  - Need Ideation phase to bring new people into ASAM process, further develop use cases, get global market relevance
  - Need central file exchange tools for collaboration between North America, Europe, and Asia
  - Need to have valid global business and technical use cases defined, with at minimum one solution documented

Questions?

THANK YOU