
ETHERNOVIA
VIRTUALIZING VEHICLE COMMUNICATION

IEEE P802.1DG

Outline for Draft 1.4

to be ready for TG Ballot before January 2022 Interim

(start ballot by week of Dec. 20th 2021)

Exclusions for Draft 1.4!

- Wireless links of any sort (cellular, wifi, …)
- Ethernet encapsulation (USB, APIX, …)
- Environmental Specifications (AEC Q100, temp., EMC, EMI, …)
- Layer 1 details
- Link Aggregation
- TPMR specifics
- Smart Charge Communication
- OBD to Tester (ISO 13400) details
- Robo-Taxi specifics
- Profile definitions or requirements

Focus on Information not Requirements

- The new draft will focus on discussions and concepts
- Only descriptive, no normative language will be added
- Lessons-Learned from and parallels with:
  - AVnu
  - IEEE P60802
  - AutoSAR

Outline

- Definitions and Abbreviations
  - Automotive Terminology (NM, UDS, …)
  - Time-Related Terminology (align w/ Autosar)
- Limitations
  - Availability of GPS, cellular, …
  - power consumption
  - accessibility
  - start-up times (FMVSS111)
  - assembly line and repair
- Topologies (judge and justify network sizes)
  - Domain
  - Star
  - Zonal
  - Daisy Chain

ECU model

- the role Middleware
- Safety and Security boundaries
- Switch/Bridge Management
  - VLAN for security
  - Safe Switch management
  - Discussion of Monitoring
- Considerations for Small-ECUs (camera, display, microphone)
- Considerations for Compute-Platforms (hypervisor)
- Power Modes
- Diagnostics Modes
- “Birth Certificate” - protection from fraud or theft
- Start-Up times

Traffic Types

- Detailed description from contribution
- Reduction to 3 basic types:
  - cyclic/periodic
  - event based
  - reliable data transport

Safety & Security

- Discussion of Differences
- Safety
  - Discussion of CRC32(-P4)
  - Safety at network layer vs. at application layer
  - discussion on redundancy (CB, 1AS, spanning tree)
- Security
  - Discussion on differences between SecOC, IPsec, TLS, MACsec (start-up, number of keys, multicast, …)
  - Discussion of possible key exchange protocols (IKE, UDS, MKA, …)
  - VLANs
  - ACLs and Policing
  - Authentication, Authorisation and Privacy
  - Link-up detection (802.1X) benefits and limitations
  - Attack models

Shapers

- Goals of shaping in the automotive context
  - dangers of retransmission
- Discussion of Shapers - configuration effort
  - TAS modes
  - Qci dependencies
  - 1722 relation
- Discussion of combination of Shapers (CBS+TAS, ATS+TAS)
- Discussion of combination with Pre-Emption (CBS+preemption, ATS+preemption, TAS+preemption)
- Priority vs. WRR or other selection

Policing

- Definition
- Strict policing on high-prio and high-BW
- Risks of retransmission

Protocols

- SRP - sub-protocol complexity, security issues
- LLDP - supported TLVs
- DoIP - ISO 13400
- RAP
- Automotive NM
- SOME/IP
- Address Assignment (DHCP, MAAP, P802.1CQ, …)
- DLT, XCP

Configuration

- Central vs. Distributed
- Dynamic vs. Static
  - semi-static (from a list)
  - defined learning
- YANG vs. ARxml
- Discussion of Service-Discovery
- Role of UDS

Error Reporting

- Metering and counters
- Yang and UDS

Time-Synchronisation

- Discussion of traceability to TAI/UTC (availability)
- Discussion of accuracy (audio, …)
- Discussion of failure modes (e.g. from AVnu profile)
- Discussion of CMLDS in Domains
- Discussion of differences to Autosar
- Supported TLVs and control messages
- Discussion Rate-Ratio from Sync or pDealy (start-up time)

(IEEE1588-2019, subclause 7.2.1, p.72 / 802.1AS-2020, 8.2.1, p.48)

Max Turner
Utrechtseweg 75
NL-3702AA Zeist
The Netherlands
+49 177 863 7804
max.turner@ethernovia.com


THANK YOU
ETHERNOVIA
VIRTUALIZING VEHICLE COMMUNICATION