IEEE P802.1DG Profile Format - Updated

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August 11 IEEE 802.1DG Weekly Call

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IEEE P802.1DG Profile Format

Need:

- Profile(s) is structured in terms that is best understood and usable by Automotive developers and OEM's based on Communication and Application requirements
- A user-friendly profile structure that covers a large majority of the suggested use cases
- A profile structure that enables a user of the standard to quickly understand functional required/necessary, recommended, and optional standards implementation elements
- A profile structure that allows the 802.1DG working group to focus on specific functional standard elements in order to complete this standard in a timely manner

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Proposed Structure:

1.x Overview:

1.1 Scope (per PAR/CSD)
1.2 Purpose (per PAR/CSD)
1.3 Introduction (if required)
1.3.1 Structure of Associated document and why

- Definitions:
  - Automotive Industry
  - IEEE
  - Usage
- Abbreviations
- In-Vehicle Assumptions (examples include)
  - Excludes 802.11 wifi (i.e. .11p (DSRC), .11ax, .11ac)[1]
  - Excludes wireless (i.e. 4g LTE, 5g FP1/FP2)[1]
  - No Ethernet encapsulation
  - Topology use cases (specify #of hops and link types)
  - AEC-Q100 or SAE Temp grades (e.g. Freq stability, EMI environmentals?)
  - ISO 26262 ASIL Safety requirements
  - ISO/SAE 21434 Security requirements (e.g. based on std V-Model)
  - Vehicle Location specifics (i.e. <1sig over a x time period)
  - Equipment requirement assumption (e.g. Oscillator spreadsheet showing ±PPM & freq w/ min-max variation requirements (freq,PPM) per AEC-Q100 temp grade, acceptable bridge residence times (i.e. 10ms), sensor B/W and latency requirements)
  - Ethernet only (do we include integration with AUTOSAR stack e.g. EthTsync?)

[1] NOTE: though not covered by CSD/PAR, I suggest this is an important IVN element to extend 802.1 standards to (e.g. 802.1AS)

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Proposed Structure: (con't)

2.x Conformance Functional Categories – <specific category content is up for discussion>:

2.1 Layer 1 usage??? Based on 802.3-20xx communication interlink partner media (per PAR/CSD)
- a) Required (SHALL)
- b) MAC Control (clause 2)
- c) Recommended (SHOULD)
- d) Optional (MAY)

2.2 LAN Based Fundamentals (reference to 802.1Q-2018 – see example)

2.3 Diagnostics (i.e. Layer 2-UDS, Layer 3-DoIP (ISO 13400), OTA S/W security Authentication based on ASIL compliance)- goes in Overview?

2.4 Time Sync (i.e. hop-to-hop, E2E, GNSS sync, time manager, fast/normalized startup, redundancy, etc)
- 2.4.1 1588 ?
- 2.4.2 802.1AS-2020

2.5 Ingress Packet Inspection/Policing (i.e. 128byte vs. 96byte TCAM H/W inspection and why, IDS/IPS S/W or H/W, latency, classifications, read/write coloring queuing array, etc)
- 2.5.1 802.1Qci-2017 (PSFP)
- 2.5.2 802.1Qcr-2020 (ATS)

2.6 Egress Shaping:
- 2.6.1 802.3br/802.1Qbu-2016 (Frame Preemption)
- 2.6.2 802.1Qbv-2015 (TAS)
- 2.6.3.x 802.1Qav/802.Qat-802.1Qcc/802.Qch (CBS – Note I do not believe "P" in SR is required unless used for .1Qcc) – Section 34/35
- 2.6.4 802.1Qcc
  - 2.6.4.1 Registration and reservation Procedures
  - 2.6.4.1 CNC
  - 2.6.4.2 CUC

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Proposed Structure: (con't)

2.x Conformance Functional Categories – <specific categories are up for discussion>:

2.6 Egress Shaping: (con't)
- 2.6.5 802.1Qcr (ATS)
- 2.6.5 802.1Qdd (RAP)

2.7 Safety/ISO26262 "Common Cause Faults" for system and communications network design (i.e. fault tolerance)
- 2.7.1 802.1Qca (Path Control and Reservation-PCR/Shortest Path Bridging-SPB)
- 2.7.2 802.1CB-2017 (FRER)
  - 2.7.2.1 FRER R-Tag
  - 2.7.2.2 802.1Qdd (dynamic reservations)
- 2.7.3 802.1AX-2020 (Link Aggregation)
- 2.7.4 802.1Qcz (Congestion Isolation)
- 2.7.5 802.1AS-2020 (i.e. BMCA, multiple domain clocks, including .1ASdm)
- 2.7.6 802.1Qcc-2018 (i.e. CNC/CUC)
- 2.7.7 802.1CS (Link-Local Registration Protocol)

NOTE: I do not believe STP, RSTP or HSR is to be used for fault tolerance – we can discuss)

2.8 Security
- 2.7.1 802.1CQ (Multicast and Local Address Assignment)
- 2.7.2 802.1X fundamentals (include LLDP/802.1AB(dh)?)
- 2.7.3 802.1AEcg (MACSec)
  - 2.8.2.1 .1AEcg
  - 2.8.2.2 .1AEdk
- 2.7.4 (IPSec) -??
- 2.7.5 802.1AR (Device Authentication)

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Proposed Structure: (con’t)

2.x Conformance Functional Categories – <specific categories are up for discussion>:

2.9 Other

2.9.1 1722

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Proposed Structure: (example)

2.x Conformance Functional Categories:– (reference 802.1Q-2018 clause 5.2)

2.2 LAN Based Fundamentals – excludes areas that are in another functional classification (i.e. 5.4.1.5):

2.2.1 VLAN Bridge Component: - review of clause 5.4
- Required (SHALL)
- Recommended (SHOULD)
- Optional (MAY)

2.2.2 C-VLAN Bridge conformance - review of clause 5.5, 5.9
- Required
- Recommended
- Optional

2.2.3 Provider Bridge (S-VLAN) conformance - review of clause 5.6, 5-10
- Required
- Recommended
- Optional

2.2.4 Priority-based Flow Control (PFC) conformance – review of clause 5.11, 36.1
- Required
- Recommended
- Optional

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Proposed Structure: (example con't)

Conformant components and equipment – (clause 5.2)

2.x Conformance Functional Categories:– (reference 802.1Q-2018 clause 5.2)

2.2 LAN Based Fundamentals – excludes areas that are in another functional classification (i.e. 5.4.1.5):

2.2.5 MAC Bridge conformance – review clause 5.13, 5.14

- Required
- Recommended
- Optional

2.2.6 TPMR conformance – review clause 5.15, 5.16, 8.5

- Required
- Recommended
- Optional

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