

P802.1DF Status Update

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Standard Status

- Current Status
 - > D0.1 release on 2020 Dec
 - > 37 comments received and solved, most on imprecise terms (E.g. definition of Service level agreements(SLA))
- Risks: Use cases and requirements should be confirmed from more telecom experts.
 - Invited Telecom colleagues from China Unicom/China Mobile/China Telecom to speak on use cases and requirements, and pre-standard demonstrations.
 - Invite liaison letters from ITU-T SG13 to communicate and share standard drafts on requirements of large scale networks.

Interests and Progress Outside IEEE

Requirements discussion in IETF DetNet

Requirements are widely discussed and is in WG draft ,
<Requirements for Scaling Deterministic Networks >
<https://datatracker.ietf.org/doc/draft-ietf-detnet-scaling-requirements/>

- Tolerate Time Asynchrony
- Support Large Single-hop Propagation Latency
- Accommodate the Higher Link Speed
- Be Scalable to The Large Number of Flows and Tolerate High Utilization
- Tolerate Failures of Links or Nodes and Topology Changes
- Prevent Flow Fluctuation
- Be Scalable to a Large Number of Hops with Complex Topology
- Support Multi-Mechanisms in Single Domain and Multi-Domains

Requirements discussion in ITU-T Q6 SG13

ITU-T Y.3121 <Quality of service requirements and framework for supporting deterministic communication services in local area networks for IMT-2020> is released in January 2023

- Support intra-domain QoS in one domain;
- Support E2E QoS across multiple domains (e.g. 5G + TSN);
- Support the awareness of the QoS objectives of applications;
- Recommended to provide at least one of QoS metrics (e.g., latency, jitter, and network bandwidth)
- Need to interpret application QoS metrics and map to the network QoS metrics.
- Map Application QoS metrics to deterministic communication services. And network QoS metrics.

Challenges and Chances

- **Scalability** is the most challenging factor, complex schedule/configuration is not good for large scale network ,either for time synchronization cost or for complex schedule;
- **Lack of end-to-end** guarantee solution across multiple network segments (e.g. 5G + TSN);
- **Lack Of differentiated/Flexible level of SLA services** and management capability
 - Urgent traffic (Alarms, protocol packets) - low latency
 - Periodic traffic (Sampling data) - bounded low latency
 - Bursty traffic (Camera) - bounded medium latency
 - Best effort traffic (IT applications) - best effort

-- P802.1Qdv Enhancements to CQF is improve scalability on networks with large number of flows.

Discuss

- PAR Extension

Why:

TSN features were originally designed for small- to medium-scale bridged networks. Concerns on the scalability of TSN networks caused low participation in IEEE P802.1DF by telecom experts. Recent work to enhance Cyclic Queuing and Forwarding (IEEE P802.1Qdv) promises to improve the scalability of TSN. This should increase participation by telecom experts sufficiently to make progress on IEEE P802.1DF.

Actions to complete include subsequent Task Group balloting to reach technical completeness, followed by Working Group balloting and Standards Association balloting

Thank you.

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