

802.24 – 802.1 TSN Joint Session

January 2017 Meeting

Atlanta, GA, USA

PSCC Liaison Report

- The PES PSRC and Substation SCC have been reorganized and will become the PSCC (Power Systems Communications and Cybersecurity) committee. (Effective Jan 2017)

- I attended the PSCC meeting and met with the leadership.
 - Chair: Mike Dood (Schweitzer Engineering Laboratories)
 - Vice Chair: Ken Fodero (Schweitzer Engineering Laboratories)
 - Secretary: Craig Preuss (Black and Veatch)
 - Established liaison between PSCC and 802.24 / 802.1
 - PSCC will provide review and comments on TSN white paper (and further activities in their scope)
 - PSCC is interested in know about relevant activities in IEEE802 – would like a short report after 802 Plenaries.

Power Systems Communication and Cyber Security Committee

– Subcommittee P

- P1 Revision of IEEE Std profile for the use of IEEE 1588 Precision Time Protocol
- P2 Electric Power Systems Communications – Distributed Network Protocol (DNP3)
- P3 Exchanging information between networks implementing IEC 61850 and IEEE Std 1815 (DNP3)
- P5 Recommended Practice for Network Communications in Substations (P1516)
- P6 Configuring Ethernet LAN Infrastructure
- P7 Review of C37.94 (Optical Fiber Interfaces Between Teleprotection and Multiplexer Equipment)
- P8 Standard mapping between C37.118 and IEC 61850-90-5
- P11 Transitioning to Cloud Computing, SDN, and NFV at electric power utilities

Power Systems Communication and Cyber Security Committee

Subcommittee S

- S2 Serial SCADA Protection Protocol (P1711.1)
- S3 Interoperability of IPSEC within utility control systems
- S4 Secure SCADA Communication Protocol (P1711.2)
- S5 Extensions to Cyber Security Requirements for substations P&C Systems

PSRC (Power Systems Relaying and Control Committee)

H Subcommittee – Relay Communications Subcommittee

- H11 Synchrophasor Standards Working Group
- H32 Performance Requirements for teleprotection over Ethernet
- HTF41 Revision of IEEE 1646 Communications Delivery time performance requirements

Plans for TSN white paper

- IEC TC 57 Collaboration
- TSN specified in 61850 through IEC
 - IPV6 is also being adopted into 61850
 - OPC Foundation, ODBA are adopting TSN (and also use 61850)
 - IEC TC57 is developing profiles for use of TSN.
 - Profiles for application domains.

Outline of TSN white paper

- Describe why TSN is needed in a utility
 - Define what “realtime” means in the context of specific grid use cases and applications
- Describe how TSN works
 - Don’t focus on the standards themselves, but focus on basic capabilities.
 - Goal of low latency vs maximum worst case latency, and leading to zero congestion loss.
 - A new optimization, compared to best-effort packet world.
 - It is not just low latency, but bounded, deterministic worst case latency. That enables the application.
 - Shifting paradigm from acting on the packet to acting when the packet says to act.
 - Secondarily, ability to guard against equipment failure.
 - Informational material : 802.1Qbu, 802.3br, 802.1Qbv, 802.1Qat, 802.1Qca, CB, Qcc, Qch, Qci, Qcn, Qcr, AECg
 - Discuss 802.1CM and BA, as an example of industry profiles for the use of TSN
- Understand IEC 61850 activities and relationships
 - How standardized APIs are integrated into 61850
- What is the set used for grid applications? Relate to IEC TC57 Profiles
 - Harmonization of TC65 (automation) with TC57 profiles
- Explain relationships to time synchronization in 802.1AS
 - Profiles of IEEE 1588
- Relationship to IETF DETNET
 - DETNET works over a routed network.
- What is the opportunity for wireless standards to leverage? DETNET could take advantage.

Next Steps

- How to collaborate between meetings
 - Use both 802.1 reflector and 802.24 reflector
- Initial Draft
 - Tim will post previous slide as document on 802.24 Mentor, and post a link on the reflectors.
 - Text contributions to the outline are requested