

# Scalable Synchronization Networks (SCSN) Problems and Analysis

draft-hjxl-scsn-ps-00

draft-jiang-scsn-gap-analysis-00

L. Han, L. Geng                      China Mobile♪

Y. Jiang, X. Liu, J. Xu              Huawei♪

D. P. Venmani                         Orange Labs♪

# Backgrounds

---

- GPS/GNSS signal is not always available, especially for small cells; on the other hand, a dedicated SDH sync network is not cost effective;
- Packet networks are becoming mainstream mobile backhaul solution, it is important to converge sync within the same packet network, and distribute high precision freq/timing in the same infrastructure;
- IEEE 1588v2 and SyncE are widely implemented but deployments are usually in small scale;
- With the deployment of 4G network and 5G is on the horizon, the size of the mobile network and its backhaul network will both increase greatly, large scale sync networks will become inevitable.
- Detnet also requires a high precision synchronization supports, which may also cover a great number of nodes.

# SCSN Problems

---

- Problem spaces
  - Synchronization is resorted to manual provisioning and configuration, it is very onerous and error-prone to set up synchronization distribution paths with complex parameters for a large network;
  - Traditionally, synchronization network maintenance is manually done with hop by hop trouble shooting, which is even more complex, time-consuming and inefficient for a large network;
  - It may pose as a challenge to recover from sync faults in a large network

# SCSN Gap Analysis

---

- ITU-T
  - Physical layer frequency sync, such as SDH, Ethernet (syncE)
  - PTP profiles for telecommunications
  
- IEEE
  - IEEE 1588 WG published 1588-2008/PTPv2, synchronization methodology, datasets and state machine; Revision is in progress, 1588-2017?
  - IEEE 802.1AS defines a PTP profile for time-aware bridges
  
- IETF
  - NTP WG published NTPv4, potential accuracies of microseconds
  - TICTOC WG is progressing on 1588 over MPLS, and PTP profile for enterprises

**These specifications will be fundamental for SCSN, but no SDO is addressing these problems yet!**

# SCSN Topics

---

- Some potential SCSN topics
  - Scalability issues in configuration, to develop PCE-like protocols or I2RS-like mechanisms for the configuration of synchronization paths
  - OAM tools, to trace and identify the actual path for sync distribution, and locate a fault in any synchronization path
  - SCSN resiliency mechanism, how to recover from faults in synchronization networks

# Discussions

---

- Is there any interest in solving these SCSN problems in the IETF?
- What topic should we focus on?
  - Scalability issues in configuration
  - OAM
  - Resiliency
  - Any other mechanisms to help the deployment of synchronization networks

***Thank You***