

Proposal on FTS and PTS

Tim Frost, Calnex Solutions Ltd.



Compliance with IEEE Standards Policies and Procedures

Subclause 5.2.1 of the *IEEE-SA Standards Board Bylaws* states, "While participating in IEEE standards development activities, all participants...shall act in accordance with all applicable laws (nation-based and international), the IEEE Code of Ethics, and with IEEE Standards policies and procedures."

The contributor acknowledges and accepts that this contribution is subject to

- The IEEE Standards copyright policy as stated in the *IEEE-SA Standards Board Bylaws*, section 7, <http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#7>, and the *IEEE-SA Standards Board Operations Manual*, section 6.1, <http://standards.ieee.org/develop/policies/opman/sect6.html>
- The IEEE Standards patent policy as stated in the *IEEE-SA Standards Board Bylaws*, section 6, <http://standards.ieee.org/guides/bylaws/sect6-7.html#6>, and the *IEEE-SA Standards Board Operations Manual*, section 6.3, <http://standards.ieee.org/develop/policies/opman/sect6.html>

**IEEE [WG 1914.1]
[WG Name]
[WG Chair Name and Email]**

Proposal on FTS and PTS

Date: 2019-01-15

Author(s):

Name	Affiliation	Phone [optional]	Email [optional]
Tim Frost	Calnex Solutions Ltd.	+44 7825 706952	tim.frost@calnexsol.com

Current text

The text agreed on the teleconference, Friday 11th January 2019
(changes in red were made on the call):

The following PTP profiles are applicable to NGFI network time distribution:

- a) PTP Profile with Full Timing Support (FTS): ITU-T G.8275.1 PTP Telecom Profile for Phase/Time Synchronization with Full Timing Support from the Network.
- b) PTP Profile with Partial Timing Support (PTS): ITU-T G.8275.2 PTP Telecom Profile for Phase/Time Synchronization with Partial Timing Support from the Network.

For NGFI-I networks, FTS shall be supported and PTS is optionally supported.

For NGFI-II networks, at least one of FTS and PTS shall be supported.

Issues with text

The text represented the agreement with the AT&T proposal from [tf1_1901_cai_tazi_FTS_PTS_way_forward_1.pdf](#):

- For NGFI-I (fronthaul), ITU-T G.8275.1 (FTS) is mandatory while ITU-T G.8275.2 (PTS) is optional
- For NGFI-II (midhaul), the standard specifies the requirement as it is today (either G.8275.1 or G.8275.2 shall be supported)

This proposal was agreed on the call (11 Jan).

While accepting the agreement, there are three issues with the current text:

1. The PTP profile itself doesn't define the architecture. All elements of the architecture are required to deliver the expected performance.
2. The PTS architecture doesn't target the same level of performance as the FTS architecture. FTS targets both Category C ($\pm 1.5\mu\text{s}$) and B ($\pm 130\text{ns}$), while PTS only targets Category C.
3. The PTS architecture is still under development at ITU, as are the FTS network limits for higher accuracy (Category B) applications.

Proposed new text:

The following PTP-based architectures are applicable to NGFI network time distribution:

- **Full timing support (FTS) architecture**, operating over Ethernet networks, and consisting of boundary or transparent clocks supported by SyncE at every node. The following ITU-T recommendations apply:
 - The PTP profile defined in G.8275.1
 - The network limits defined in G.8271.1
 - The PRTCs defined in G.8272 and G.8272.1
 - The SyncE and enhanced SyncE clocks defined in G.8262 and G.8262.1
 - The Telecom Boundary Clock (T-BC) defined in G.8273.2
 - The Telecom Transparent Clock (T-TC) defined in G.8273.3
 - The Telecom Time Slave Clock (T-TSC) defined in G.8273.2
- **Partial timing support (PTS) architecture**, operating over IP networks, consisting of time distribution over networks where not every node will contain a boundary or transparent clock. The following ITU recommendations apply:
 - The PTP profile defined in G.8275.2
 - The network limits defined in G.8271.2
 - The PRTCs defined in G.8272
 - The Partial Timing Support clocks to be defined in G.8273.4

The FTS architecture, using Class C and D clocks defined in G.8273.2, and the enhanced SyncE clocks defined in G.8262.1, targets both Category C (TAE $\leq 3\mu\text{s}$), and Category B (TAE $\leq 260\text{ns}$) applications.

(Note: The network limits for Category B applications are still under development as of January 2019)

The PTS architecture targets Category C applications.

(Note: The clock specifications for PTS clocks are still under development as of January 2019)

For NGFI-I (fronthaul) networks, the FTS architecture shall be supported, and the PTS architecture may optionally be supported.

For NGFI-II (midhaul) networks, at least one of the FTS or the PTS architectures shall be supported.