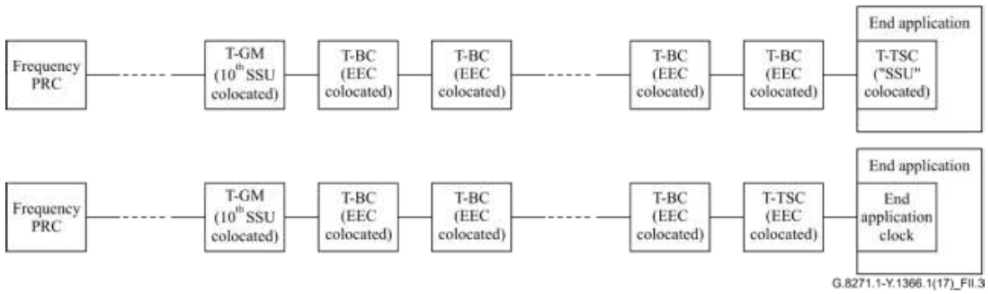
ITU-T Study Group 15

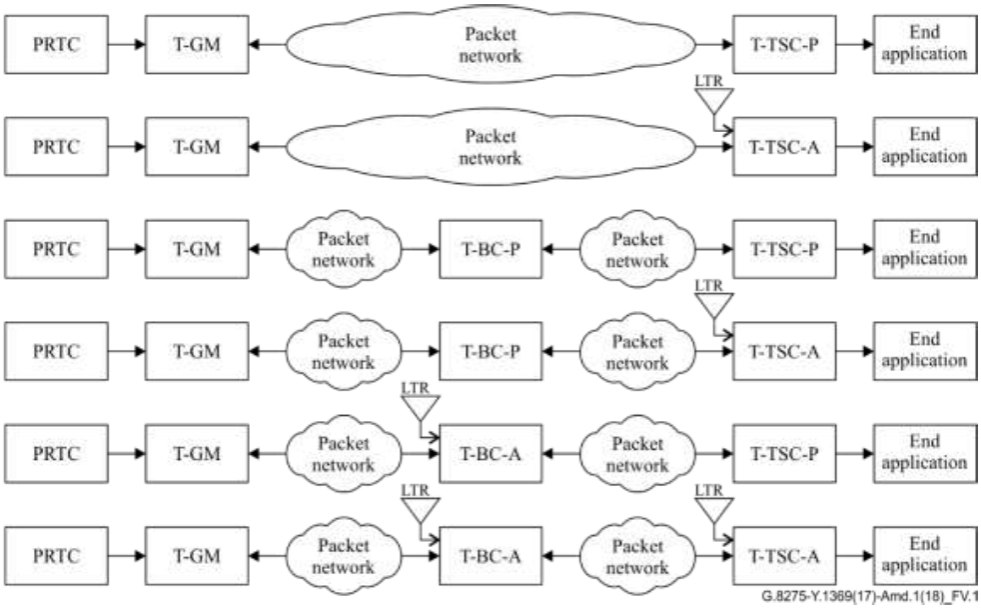
G.8275.1, G.8275.2 PTP Profiles for time sync

- IEEE 1588 profiles for the distribution of phase and time in telecom environments
- Profiles define what aspects of the IEEE 1588 standard are applicable for a given application

G.8275.1 Networks



G.8275.2 Networks



1. ITU-T G.8275.1 – Precision time protocol telecom profile for phase/time synchronization with full timing support from the network

2. ITU-T G.8275.2 – Precision time protocol telecom profile for phase/time synchronization with partial timing support from the network

G.8275.1 defines the PTP profile for time distribution where all network elements contain PTP clocks (full timing support) and G.8275.2 defines the PTP profile for time distribution where only a subset of network elements contain PTP clocks (partial timing support).
For G.8275.1, the key aspect of the full timing support is that PTP and physical layer frequency synchronization (e.g., Synchronous Ethernet) are used together to meet the end to end and individual clock performance characteristics. PTP message rates are defined taking advantage of an accurate and stable frequency.
For G.8275.2, the key aspect of the partial timing support is that it does not require PTP support in every network element. This allows for deployments where G.8275.1 cannot be deployed.
G.8275.1 defines transport of PTP in Ethernet, OTN, FlexE and MTN networks.
G.8275.2 defines transport of PTP in networks supporting IPv4 or IPv6.
There are many similarities within these two profiles. Both support grandmaster (T-GM), boundary (T-BC, T-BC-A, TBC-P) and slave only clocks (T-TSC, T-TSC-A, T-TSC-P).
The profiles use a common alternate best master clock algorithm (aBMCA) that differs from the default BMCA of the IEEE standard. It supports multiple active grandmaster clocks. Given paths to two T-GM of equal quality, the aBMCA selects the shorter path. Additional controls have been added: masterOnly, notMaster, and slaveOnly to provide override to the aBMCA and control the direction of timing flow in the network.
The profiles also add support for various packet timing signal fail conditions and actions as well as the use of the synchronizationUncertain functionality. These are important to detect and avoid abnormal communication issues in the PTP clock network.
The PTP clockQuality attribute is very important for identifying the best source clock within the aBMCA. The profiles provide detailed procedures for how a clock determines its quality level and sets its own clockQuality values.
Within each profile, Annex A provides the complete definition of a PTP profile as requested by the IEEE 1588 standard. It includes profile version identification, default and ranges for all PTP dataset attributes, state of optional features, clock identity format, aBMCA and messaging aspects.

G.8275.2 profile includes support for a clock using a local PRTC input while at the same time running a PTP slave port as a backup time source. These are the T-BC-A and T-TSC-A clocks of the profile.