Annex F

(informative)

PTP profile included in this standard

F.1 General

The specification in this standard of synchronized time transport over a full-duplex point-to-point link includes a PTP profile. The information contained in a PTP profile is described in 20.3 of IEEE Std 1588-2019. This annex summarizes the PTP profile for transport of timing over full-duplex point-to-point links. This PTP profile is also used in the transport of timing over CSN when a CSN clock reference is not present (see Clause 16). This PTP profile is not used in the transport of timing over IEEE 802.11 links and IEEE 802.3 EPON links; both these transports use native timing mechanisms to assist in the synchronized time transport.

F.2 Identification

The identification values for this PTP profile (see 20.3.3 of IEEE Std 1588-2019) are as follows:

> PTP Profile:
> IEEE 802.1AS PTP profile for transport of timing
> Profile Name: IEEE 802.1AS PTP profile
> profileNumber: 0
> primaryVersion: 2
> revisionNumber: 0
> profileIdentifier: 00-80-C2-00-02-00

NOTE—In the above profileIdentifier (see 20.3.3 of IEEE Std 1588-2019):
   a) 00-80-C2 (first three octets) is the OUI owned by the IEEE 802.1 Working Group (it identifies the organization that specifies the PTP profile);
   b) 00 (fourth octet) is a number that identifies the PTP profile, among all profiles specified by the organization that owns the OUI (or, in general, OUI or CID) of item a);
   c) 02 (fifth octet) is the primary version of this PTP profile; and
   d) 00 (sixth octet) is the revisionNumber of this PTP profile.

This profile is specified by the IEEE 802.1 Working Group of the IEEE 802 LAN/MAN Standards Committee.

A copy can be obtained by ordering IEEE Std 802.1AS-2020 from the IEEE Standards Organization.[19]

This PTP profile is a revision of the PTP profile included in IEEE Std 802.1AS-2011, i.e., major changes have been made to the profile relative to Version 1.0. Therefore, the primaryVersion is changed to 2, with revisionNumber 0.

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[19] IEEE publications are available from The Institute of Electrical and Electronics Engineers (https://standards.ieee.org).

F.3 PTP attribute values

The ranges and default values for time-aware system and PTP Instance attributes covered by this profile are as follows:

a) A domain whose domain number is 0 is present. A domain whose domain number is in the range 1 through 127 can be present (see 8.1).

b) The default logAnnounceInterval (see 10.7.2.2) is 0. The value 127 is supported.

c) The default logSyncInterval (see 11.5.2.3) is –3. The value 127 is supported.

d) The default logPdelayReqInterval (see 11.5.2.2) is 0. The value 127 is supported.

e) The default announceReceiptTimeout (see 10.7.3.2) is 3.

f) The default values of priority1, for different media, are specified in 8.6.2.1, Table 8-1. The value of priority1 for a PTP Instance that is not grandmaster-capable is 255.

g) The default value of priority2 is 248 (see 8.6.2.5).

h) The default observation interval for offsetScaledLogVariance is equal to the default sync interval, i.e., 0.125 s (see 8.6.2.4).

F.4 PTP options

a) The BMCA of this standard is the default BMCA according to the specifications of 9.3 of IEEE Std 1588-2019.

b) The following options of 17.7 of IEEE Std 1588-2019 are invoked:

1) The FAULTY state is not used.

2) The UNCALIBRATED state is not used.

3) The LISTENING state is not used

4) The PRE_MASTER state, and PRE_MASTER qualification are not used.

5) The foreign master feature is not used.

c) The management mechanism is the mechanism specified in Clause 14 and Clause 15.

d) The path delay mechanism is the peer-to-peer delay mechanism (see Clause 11).

e) The transport mechanism is full-duplex and point-to-point, and it uses attribute values described in Annex E of IEEE Std 1588-2019 for IEEE 802.3 Ethernet. Specifically, the address, EtherType, and subtype are specified in 11.3.4, 11.3.5, and 11.3.6.

f) A PTP Instance that contains one PortSync and one MD entity is an Ordinary Clock. A PTP Instance that contains more than one PortSync and more than one MD entity is a Boundary Clock.

g) Each port of a time-aware system measures the frequency offset of its neighbor, at the other end of the attached link, relative to itself (see Clause 11). The frequency offset, relative to the Grandmaster Clock, is accumulated in a standard organization TLV that is attached to the Follow_Up message if the PTP Port is two-step and the Sync message if the PTP Port is one-step (see 11.4.4.3). The standard organization TLV also carries information on Grandmaster Clock traceability and phase and frequency change due to the most recent Grandmaster PTP Instance change. The physical adjustment of the frequency of the LocalClock entity (i.e., physical syntonization) is allowed but not required.

NOTE 1—This feature is similar to the cumulative frequency transfer method specified in 16.10 of IEEE Std 1588-2019; however, it is not the same feature and uses a different TLV from the one used in the IEEE 1588 feature. This feature existed in the 2011 edition of the present standard and is retained for backward compatibility and also because the TLV of this standard carries additional information that is not carried in the IEEE 1588 feature [see item g) in this subclause].

h) A standard organization TLV is defined to allow a PTP Port to signal to its neighbor PTP Port that it is capable of invoking gPTP (see 10.4 and 10.6.4.4).

i) The path trace feature of 16.2 of IEEE Std 1588-2019 is used (see 10.6.3.2.8).

j) A standard organization TLV is defined that allows a port of a time-aware system to request that its neighbor slow down or speed up the rate at which it sends Sync/Follow_Up, peer delay, and/or Announce messages (see 10.6.4.3).

k) The acceptable master table feature of IEEE Std 1588-2019 is used with IEEE 802.3 EPON links to ensure that the OLT is master and ONUs are slaves.

NOTE 2—This feature is used with EPON links and therefore could be considered to be outside the PTP profile (because EPON links are not part of the PTP profile). It is included here because it is one of the optional features described in IEEE Std 1588-2019.

l) The profile isolation feature of IEEE Std 1588-2019 is not explicitly used; however, the PTP profile specified in this standard is isolated from other PTP profiles because it uses sdoId 0x100 (see 8.1).

m) A time-aware system can have more than one gPTP domain (see 8.1).

n) The Common Mean Link Delay Service specified in 16.6 of IEEE Std 1588-2019 is required if more than one domain is implemented and is optional if one domain (with domainNumber 0) is implemented (see 11.2.17).

o) The security mechanism of 16.14 of IEEE Std 1588-2019 and security annex (Annex P) of IEEE Std 1588-2019 are not used.

p) The external port configuration feature of 17.6 of IEEE Std 1588-2019 is optional in the present standard.

q) Except for items g) through p) in this subclause, the optional features of Clause 16 and Clause 17 and the optional annexes of IEEE Std 1588-2019 are not used.

F.5 LocalClock and PTP Instance performance requirements

The LocalClock performance requirements are as specified in B.1. The PTP Instance performance requirements are as specified in B.2.