

	ITU-T PTP Telecom Profile for Frequency (G.8265.1 Annex A)	ITU-T PTP Telecom Profile for Phase/Time (G.8275.1 Annex A)
Objective	Frequency distribution to better than 16ppb (long term fractional frequency offset specified in G.8261.1)	Time distribution to better than $\pm 1.5\mu\text{s}$
Profile Identification		
profileName	ITU-T PTP Profile for Frequency Distribution without timing support from the network (Unicast mode).	ITU-T PTP profile for phase/time distribution with full timing support from the network.
profileVersion	1.2	1.0
profileIdentifier	00-19-A7-00-01-00	00-19-A7-01-01-00
Specified by	ITU-T	ITU-T
Location	www.itu.int	www.itu.int
PTP Options		
Permitted Nodes	Ordinary clocks (i.e. Grandmasters, slave-only clocks).	Ordinary clocks (i.e. Grandmasters, slave-only clocks), boundary clocks.
Prohibited Nodes	Boundary clocks, transparent clocks.	Transparent clocks.
Transport Mechanisms	Both masters and slaves must support IEEE1588-2008 Annex D IPv4/UDP stack. Both masters and slaves may support IEEE1588-2008 Annex E IPv6/UDP stack.	Required: IEEE802.3 Ethernet, as per IEEE1588-2008 Annex F. The use of VLAN tags is not allowed. Other transport mechanisms (e.g. IP/UDP as in Annexes D & E) are for further study.
Multicast or Unicast	Both masters and slaves must support full unicast operation (see details below).	Full multicast operation, using both of the addresses noted in IEEE1588-2008 Annex F. Unicast is not permitted.
BMCA	Static BMCA specified (see below).	Alternate BMCA specified (see below).
Path Delay Measurement	Uses delay_request/response mechanism, if required (i.e. two-way operation). Peer delay mechanism must not be used.	Uses delay_request/response mechanism. Peer delay mechanism must not be used.
PTP Management	Not specified in this version of the profile.	Not specified in this version of the profile.
Message Types	Used: Announce, Sync, Follow-up, Delay_Req, Delay_Resp, Signaling Not used: Pdelay_Req, Pdelay_Resp, Pdelay_Resp_Follow_Up The use of Management messages is for further study.	Used: Announce, Sync, Follow-up, Delay_Req, Delay_Resp Not used: Pdelay_Req, Pdelay_Resp, Pdelay_Resp_Follow_Up The use of Signaling and Management messages is for further study.
One-step and Two-step clock	Master may support either one-step or two-step clocks, or both. Slaves must support both one-step and two-step clocks, without configuration.	Clocks may transmit messages using either one-step or two-step modes. Clocks must be capable of receiving and handling messages from both one-step and two-step clocks, without configuration.
One-way and Two-way Operation	Masters must support both one-way and two-way operation. Slaves may support either one-way or two-way, or both.	Only two-way operation is permitted.
Clock Identity	EUI-64 (as specified in clause 7.5.2.2.2 of IEEE1588-2008).	EUI-64 (as specified in clause 7.5.2.2.2 of IEEE1588-2008).
Security	For further study. IEEE1588-2008 Annex K experimental security protocol is not mentioned.	For further study. IEEE1588-2008 Annex K experimental security protocol is not used.
Unicast negotiation (IEEE1588-2008 clause 16.1)	Mandatory - see details below.	Not used.
Path trace (IEEE1588-2008 clause 16.2)	Not mentioned.	Not used.
Alternate timescales (IEEE1588-2008 clause 16.3)	PTP or ARB timescale used. Alternate timescales are not used.	PTP timescale used. Alternate timescales are not used.
Grandmaster clusters (IEEE1588-2008 clause 17.3)	Not mentioned.	Not used.
Alternate masters (IEEE1588-2008 clause 17.4)	Not mentioned.	Not used.
Unicast discovery (IEEE1588-2008 clause 17.5)	Not mentioned.	Not used.
Acceptable master table (IEEE1588-2008 clause 17.6)	Not mentioned.	Not used.
Cumulative frequency scale factor offset (IEEE1588-2008 Annex L)	Not mentioned.	Not used.
Message Rates		
Sync & Follow-up	1 every 16 seconds to 128 per second.	16 per second.
Delay_request/response	1 every 16 seconds to 128 per second.	16 per second.
Announce	1 every 16 seconds to 8 per second; default 1 every 2 seconds.	8 per second.
Peer Delay_request/response	None (uses Delay_request/response mechanism).	None (uses Delay_request/response mechanism).
Signaling	As required for unicast negotiation.	Not used.
Management	Not used.	

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PTP Attribute Values		
Default Data Set		
domainNumber	No default value; Configurable range 4 to 23.	Default value 24; Configurable range 24 to 43.
clockQuality.clockClass	clockClass value is derived from G.781 SSM values, according to Table 1 of G.8265.1. Masters must encode clockClass using this table according to the quality of their input reference. Slaves must use clockClass to select master to synchronize to.	clockClass encoded from the following set: - Grandmaster clocks: 6, 7, 140, 150, 160, 248 - Boundary clocks: 135, 165, 248 - Slave-only clocks: 255
clockQuality.clockAccuracy	Not used. Should be set to 0xFE (unknown) if not traceable to a time source.	Grandmasters traceable to a GNSS-locked PRTC: 0x21 (100ns). All other clocks: 0xFE (unknown).
clockQuality.offsetScaledLogVariance	Not used.	Grandmasters traceable to a GNSS-locked PRTC: 0x4E5D All other clocks: 0xFFFF (not computed).
priority1	Not used.	Range 128, default value 128.
priority2	Not used.	Range 1 to 255, default value 128.
localPriority	Not defined in IEEE1588-2008. Feature unique to ITU-T PTP Telecom Profile for Time/Phase (G.8275.1).	New dataset member defined in profile. Range 1 to 255, default value 128.
Unicast and Multicast Operation		
Full multicast operation	Not required by this profile.	Fully multicast operation.
Full unicast operation	Both masters and slaves must support full unicast operation.	Not used.
Hybrid unicast/multicast	For further study; see Appendix I for more details. Not required in first version of the profile.	Not used.
Unicast negotiation process	Both masters and slaves must support unicast negotiation (IEEE1588-2008 Clause 16.1). Masters must reject any request it can't completely fulfil, rather than grant less than the requested message rate or duration.	Not used.
Best Master Clock Algorithm		
BMCA type	Static BMCA.	Alternate BMCA (modified default BMCA).
State decision algorithm	Masters must implement static BMCA, with state BMC_MASTER, and state decision code M1. Slaves must implement static BMCA, with state BMC_SLAVE, and state decision code S1.	Based on default state decision algorithm, adding check for new parameter notSlave.
Data set comparison algorithm	Slaves select a master from a locally-provisioned list of grandmasters using the following criteria: - grandmaster not in PTSF state (Packet Timing Signal Fail), e.g. loss of sync or announce service, (or optionally, unusable timing signal). - lowest clockClass (SSM QL) value. - local priority value.	Based on default data set comparison with following changes: - moves check on GM clockIdentity to end. - removes check on GM priority1 values. - adds check for new parameter localPriority value (after GM priority2).
Master Selection and Protection		
Protection switching	A slave must switch to an alternative grandmaster under one or more of the following conditions: - clockClass (QL value) degraded to a higher value (i.e. lower quality) than an alternative master. - PTSF-lossSync or PTSF-lossAnnounce conditions on the current master. - (optional) PTSF-unusable on the current master (by configuration). If no master is acceptable (e.g. all in PTSF condition), the slave must enter holdover or free-run.	Uses Alternate BMCA to determine Grandmaster.
Additional Protection Features	Additional parameters relating to Protection Switching: - Temporary master exclusion from list of acceptable masters (by configuration). - Wait to Restore time after original master becomes traceable (delay time by configuration). - Non-reversion (implies reversion to original master is default; by configuration). - Forced Traceability, master can force clockClass to a given value (by configuration). - QL hold-off, delaying change of QL value to downstream devices (delay time by configuration). - Output squelch when no traceable master available (by configuration).	Not defined in IEEE1588-2008: Features unique to ITU-T PTP Telecom Profile for Frequency (G.8265.1).
PTSF	Three PTSF (Packet Timing Signal Fail) conditions defined: - PTSF-lossAnnounce (no announce messages received for longer than announceReceiptTimeout). - PTSF-lossSync (no sync messages received for longer than syncReceiptTimeout attribute, or no delayResponse messages received for longer than delayRespReceiptTimeout attribute). - PTSF-unusable (unable to achieve the required performance target, e.g. due to high PDV).	Not defined in IEEE1588-2008: Features unique to ITU-T PTP Telecom Profile for Frequency (G.8265.1).