Calnex
Insight and Innovation

PTP Profile Comparison for ITU-T Telecom and IEEE Power Applications

	ITU-T PTP Telecom Profile for Phase/Time (G.8275.1 Annex A)	IEEE PTP Profile for Power Systems Applications (C37.238-2011)
Objective	Time distribution to better than ±1.5µs	Time distribution to better than ±1µs
Profile Identification		
profileName	ITU-T PTP profile for phase/time distribution with full timing support from the network.	IEEE Standard Profile for Use of IEEE 1588 Precision Time Protocol in Power System Applications.
profileVersion	1.0	1.0
profileIdentifier	00-19-A7-01-01-00	1C-12-9D-00-00-00
Specified by	ITU-T	IEEE 1588 Profile for Power System Applications Working Group of the IEEE Power System Relaying Committee and IEEE Power System Substation Committee.
Location	www.itu.int	http://standards.ieee.org
PTP Options		
Permitted Nodes	Ordinary clocks (i.e. Grandmasters, slave-only clocks), boundary clocks.	Ordinary clocks, peer-to-peer transparent clocks, boundary clocks.
Prohibited Nodes	Transparent clocks.	
Transport Mechanisms	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.	IEEE 802.3 Ethernet, as per IEEE1588-2008 Annex F (PTP directly over Ethernet). VLAN tags (IEEE802.1Q) are mandatory, with a default priority of 4, and default VLAN ID of 0. Other transport mechanisms are prohibited.
Multicast or Unicast	Full multicast operation, using both of the addresses noted in IEEE1588-2008 Annex F. Unicast is not permitted.	Full multicast operation, using MAC addresses specified in IEEE1588-2008 Annex F: - Uses MAC address 01-80-C2-00-00-0E for Pdelay messages. - Uses MAC address 01-1B-19-00-00-00 for other messages.
BMCA	Alternate BMCA specified (see below).	Uses default BMCA specified in clauses 9.3.2, 9.3.3 and 9.3.4 of IEEE1588-2008.
Path Delay Measurement	Uses delay_request/response mechanism. Peer delay mechanism must not be used.	Peer delay mechanism.
PTP Management	Not specified in this version of the profile.	Management specified by way of a SNMP MIB: - Grandmaster support for SNMP MIB is mandatory. - SNMP support for other devices is optional. - Ordinary clocks not supporting SNMP must provide the following information: TimeInaccuracy, traceability, offset from GM, alarm if offset from GM reaches a configurable limit.
Message Types	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.	Used: Announce, Sync, Follow-up, Pdelay_Req, Pdelay_Resp, Pdelay_Resp_Follow_Up Not used: Delay_Req, Delay_Resp, Signaling, Management
One-step and Two-step clock	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-step operation is recommended, although two-step operation is allowed. All ingress ports must support both one-step and two-step clocks. All egress ports may support either one-step or two-step clocks, or both.
One-way and Two-way Operation	Only two-way operation is permitted.	All nodes must support two-way operation (implicit in time accuracy goal).
Clock Identity	EUI-64 (as specified in clause 7.5.2.2.2 of IEEE1588-2008).	EUI-64 constructed from EUI-48 (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 used.	Annex K security not used. Other security measures not mentioned.
Unicast negotiation (IEEE1588-2008 clause 16.1)	Not used.	Not used.
Path trace (IEEE1588-2008 clause 16.2)	Not used.	Not used.
Alternate timescales (IEEE1588-2008 clause 16.3)	PTP timescale used. Alternate timescales are not used.	The ALTERNATE_TIME_OFFSET_INDICATOR TLV must be supported by all devices.
Grandmaster clusters (IEEE1588-2008 clause 17.3)	Not used.	Not used.
Alternate masters (IEEE1588-2008 clause 17.4)	Not used.	Not used.
Unicast discovery (IEEE1588-2008 clause 17.5)	Not used.	Not used.
Acceptable master table (IEEE1588-2008 clause 17.6)	Not used.	Not used.
Cumulative frequency scale factor offset (IEEE1588-2008 Annex L)	Not used.	Not used.

Calnex
Insight and Innovation

PTP Profile Comparison for ITU-T Telecom and IEEE Power Applications

	ITU-T PTP Telecom Profile for Phase/Time (G.8275.1 Annex A)	IEEE PTP Profile for Power Systems Applications (C37.238-2011)
Message Rates		
Sync & Follow-up	16 per second.	1 per second.
Delay_request/response	16 per second.	None (uses peer delay mechanism).
Announce	8 per second.	1 per second.
Peer Delay_request/response	None (uses Delay_request/response mechanism).	1 per second.
Signaling	Not used.	Not used.
Management	Not used.	Not used.
PTP Attribute Values Default Data Set		
domainNumber	Default value 24; Configurable range 24 to 43.	Default value 0; Configurable range: 0 to 127.
clockQuality.clockClass	clockClass encoded from the following set: - Grandmaster clocks: 6, 7, 140, 150, 160, 248 - Boundary clocks: 135, 165, 248 - Slave-only clocks: 255	clockClass encoded from the following set: - Grandmaster clocks: 6, 7, 187 - Slave-only clocks: 255
clockQuality.clockAccuracy	Grandmasters traceable to a GNSS-locked PRTC: 0x21 (100ns). All other clocks: 0xFE (unknown).	
clockQuality. offsetScaledLogVariance	Grandmasters traceable to a GNSS-locked PRTC: 0x4E5D All other clocks: 0xFFFF (not computed).	
priority1	Range 128, default value 128.	Grandmaster capable clocks: Range 128, default value 128 Slave-only clocks: Range 255, default value 255
priority2	Range 1 to 255, default value 128.	Grandmaster capable clocks: Range 128, default value 128 Slave-only clocks: Range 255, default value 255
localPriority	New dataset member defined in profile. Range 1 to 255, default value 128.	Not defined in IEEE1588-2008. Feature unique to ITU-T PTP Telecom Profile for Time/Phase (G.8275.1).
Unicast and Multicast Operation		
Full multicast operation	Fully multicast operation.	Fully multicast operation.
Full unicast operation	Not used.	Not permitted.
Hybrid unicast/multicast	Not used.	Not permitted.
Unicast negotiation process	Not used.	Not used.
Best Master Clock Algorithm		
BMCA type	Alternate BMCA (modified default BMCA).	Default BMCA.
State decision algorithm	Based on default state decision algorithm, adding check for new parameter notSlave.	Default state decision algorithm.
Data set comparison algorithm	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).	Default data set comparison algorithm.
Master Selection and Protection		
Protection switching	Uses Alternate BMCA to determine Grandmaster.	Uses Default BMCA to determine Grandmaster.
Additional Protection Features	Not defined in IEEE1588-2008: Features unique to ITU-T PTP Telecom Profile for Frequency (G.8265.1).	Not defined in IEEE1588-2008: Features unique to ITU-T PTP Telecom Profile for Frequency (G.8265.1).
PTSF	Not defined in IEEE1588-2008: Features unique to ITU-T PTP Telecom Profile for Frequency (G.8265.1).	Not defined in IEEE1588-2008: Features unique to ITU-T PTP Telecom Profile for Frequency (G.8265.1).