



syn1588®

Version 1.9 – April 2020

Abstract

This application note describes the IEEE1588 profiles that are available as well as their support status by the syn1588® PTP Stack. This application notes also gives an overview of syn1588® products that support the corresponding profiles as well as an overview of hardware and software requirements for operating with a particular PTP profile.

Note: The tables below lists the profile specifications, but the syn1588® PTP Stack is not limited to these values.

PTP Profiles supported by syn1588® PTP Stack

Profile Name	PTP Stack Profile Name	M/S	Standard	Transport Protocol	Network Communication (*)	VLAN ID (*)
Default Profile	default	Both	IEEE1588-2008 Annex J.3	IPv4, IPv6, Layer2	Multicast	N/A
Default Peer2Peer Profile	default_p	Both	IEEE1588-2008 Annex J.4	IPv4, IPv6, Layer2	Multicast	N/A
Power Profile	power	Both	C37.238 2011	Layer2	Multicast	0
Power Profile	power_s	S	C37.238 2011	Layer2	Multicast	0
Power2 Profile	c37_238	Both	C37.238 2017	Layer2	Multicast	0
Power2 Profile	c37_238_s	S	C37.238 2017	Layer2	Multicast	0
Power3 Profile(**)	power3	S	IEC/IEEE61850-9-3	Layer2	Multicast	N/A
SMPTE Profile	smpte	Both	ST 2059-2	IPv4, IPv6	Multicast, Hybrid, Unicast	N/A
SMPTE Profile	smpte_s	S	ST 2059-2	IPv4, IPv6	Multicast, Hybrid, Unicast	N/A
Telecom Profile	telecom	M	G.8265.1	IPv4, IPv6	Unicast	N/A
G8275_1 Profile	G8275_1 (replaces: telecom2)	M	G.8275.1 v2.1	Layer 2	Multicast	N/A

G8275_1 Profile	G8275_1_s (replaces: telecom2_s)	S	G.8275.1 v2.1	Layer 2	Multicast	N/A
G8275_2 Profile	G8275_2	M	G.8275.2 v1.1	IPv4	Unicast	N/A
G8275_2 Profile	G8275_2_s	S	G.8275.2 v1.1	IPv4	Unicast	N/A
802.1as Profile	802.1as	Both	IEEE 802.1as		Multicast	N/A
802.1as Profile	802.1as_s	S	IEEE 802.1as		Multicast	N/A
Enterprise Profile ^(**)	Tbd.	Both	IETF draft	IPv4, IPv6	Multicast, Hybrid	N/A

Note (*)

The default network communication and VLAN ID supported by the respective profiles are listed here. One may override the profile settings by adding the appropriate parameters while invoking the syn1588[®] PTP Stack application.

Note ()**

This profile is not implemented yet but considered to be implemented within one of the next releases

Profile Requirements in Detail

E2E Default Profile

It is the Delay Request – Response Default PTP Profile.

Features	Modes/Range/Description
Standard	IEEE1588-2008 Annex J.3
Profile identifier	00-1B-19-00-01-00
Network Protocol	Layer3 IPv4 and IPv6
Network Communication Mode	Multicast
Timestamp Mode	2-step and 1-step
Delay Mechanism	End-End (Delay Request- Response)
PTP Domain	0
Message Intervals	Sync Rate 1/s, Delay Request rate 1/s and Announce Rate 0.5/s, Announce Receipt Timeout 3
Other Settings	N/A
Oregano Systems Product Support	syn1588® PTP Stack syn1588® PCIe NIC syn1588® VIP syn1588® Gbit Switch
syn1588® PTP Stack	Master and Slave mode supported OS: Windows & Linux
Special features	
Remarks	

P2P Default Profile

It is the Peer to Peer Path Delay mechanism Default Profile

Features	Modes/Range/Description
Standard	IEEE1588-2008 Annex J.4
Profile identifier	00-1B-19-00-02-00
Network Protocol	Layer3 IPv4 and IPv6
Network Communication Mode	Multicast
Timestamp Mode	2-step and 2-step
Delay Mechanism	Peer-Peer (Path delay mechanism)
PTP Domain	0
Message Intervals	Sync Rate 1/s, Peer Delay Request rate 1/s and Announce Rate 0.5/s, Announce Receipt Timeout 3
Other Settings	N/A
Oregano Systems Product Support	syn1588® PTP Stack syn1588® PCIe NIC syn1588® VIP syn1588® Gbit Switch
syn1588® PTP Stack	Master and Slave mode supported OS: Windows & Linux
Special features	
Remarks	

Power Profile (C37.238.2011)

Features	Modes/Range/Description
Standard	IEEE C37.238.2011
Profile identifier	1C-12-9D-00-00-00
Network Protocol	Layer2 VLAN
VLAN ID	0
Network Communication Mode	Multicast
Timestamp Mode	2-step and 1-step
Delay Mechanism	Peer-Peer (Path delay mechanism)
PTP Domain	0
Message Intervals	Sync Rate 1/s, Peer Delay Request rate 1/s and Announce Rate 1/s Announce Receipt Timeout 2/s for all preferred GM clocks, 3 for all other GM capable devices
Other Settings	N/A
Oregano Systems Product Support	syn1588 [®] PTP Stack syn1588 [®] PCIe NIC
syn1588 [®] PTP Stack	Master and Slave mode supported OS: Linux
Special features	
Remarks	

Power Profile 2 (C37.238.2017)

Features	Modes/Range/Description
Standard	IEEE C37.238.2017
Profile identifier	1C-12-9D-00-00-00
Network Protocol	Layer2 VLAN
VLAN ID	0
Network Communication Mode	Multicast
Timestamp Mode	2-step
Delay Mechanism	Peer-Peer (Path delay mechanism)
PTP Domain	254
Message Intervals	Sync Rate 1/s, Peer Delay Request rate 1/s and Announce Rate 1/s Announce Receipt Timeout 2/s for all preferred GM clocks, 3 for all other GM capable devices
Other Settings	N/A
Oregano Systems Product Support	syn1588 [®] PTP Stack syn1588 [®] PCIe NIC
syn1588 [®] PTP Stack	Master and Slave mode supported OS: Linux
Special features	
Remarks	

Power Profile 3 (61850-9-3)

Features	Modes/Range/Description
Standard	IEC/IEEE 61850-9-3
Profile identifier	00-0C-CD-00-01-x0 x = 0 for single attached clock x = 1 for PRP redundancy x = 2 for HSR redundancy x = 3 for both HSP and PRP redundancy
Network Protocol	Layer2
VLAN ID	N/A
Network Communication Mode	Multicast
Timestamp Mode	2-step and 1-step
Delay Mechanism	Peer-Peer (Path delay mechanism)
PTP Domain	0 (default)
Message Intervals	Sync Rate 1/s, Peer Delay Request rate 1/s and Announce Rate 1/s Announce Receipt Timeout 8 s
Other Settings	N/A
Oregano Systems Product Support	syn1588 [®] PTP Stack
syn1588 [®] PTP Stack	Slave mode supported OS: Linux
Special features	Double-attached nodes shall support at least one of the management mechanism specified in IEC 62439-3:2016 Annex E, IEC TR 61850-90-4:2013 19.3 & 19.4 or manufacturer specific solution
Remarks	

SMPTE Profile (2059-2)

Features	Modes/Range/Description
Standard	SMPTE 2059-2
Profile identifier	68-97-E8-00-01-00
Network Protocol	Layer3 IPv4, IPv6
Network Communication Mode	Multicast
Timestamp Mode	2-step and 1-step
Delay Mechanism	End-End
PTP Domain	127
Message Intervals	Sync Rate 8/s, Delay Request rate 8/s and Announce Rate 4/s Announce Receipt Timeout 3
Other Settings	N/A
Oregano Systems Product Support	syn1588® PTP Stack syn1588® PCIe NIC
syn1588® PTP Stack	Master and Slave mode supported OS: Windows & Linux
Special features	
Remarks	IPv6 had not been tested in interop tests as of yet

Telecom Profile (G8265.1)

Features	Modes/Range/Description
Standard	T-REC-G.8265.1-201604
Profile identifier	00-19-A7-00-01-02
Network Protocol	Layer3 IPv4
Network Communication Mode	Unicast (negotiated)
Timestamp Mode	2-step and 1-step
Delay Mechanism	End-End
PTP Domain	4
Message Intervals	sync rate range 1/16 to 128 Delay req rate range 1/16 to 128 Announce rate range 1/16 to 8
Other Settings	N/A
Oregano Systems Product Support	syn1588® PTP Stack syn1588® PCIe NIC
syn1588® PTP Stack	Master mode only OS: Windows & Linux
Special features	Single clock domain Alternate BMCA (different for master & slave) Complex master selection rules for slaves
Remarks	

G8275_1 Profile

Features	Modes/Range/Description
Standard	G.8275.1/Y.1369.1 (2016) Amendment 1 (08/17)
Profile identifier	00-19-A7-01-02-01
Network Protocol	Layer 2
Network Communication Mode	Multicast
Timestamp Mode	2-step and 1-step
Delay Mechanism	End-End
PTP Domain	[24 ... 43] 24 is default
Message Intervals	Sync Rate 16/s, Delay Request rate 16/s, Announce Rate 8/s
Other Settings	priority1 = 128, priority1 is ignored by alternate BMCA
Oregano Systems Product Support	syn1588® PTP Stack syn1588® PCIe NIC
syn1588® PTP Stack	Master and Slave mode supported OS: Linux only
Special features	Alternate BMCA is used Peer delay must not be used P2P TC are prohibited
Remarks	

G8275_2 Profile

Features	Modes/Range/Description
Standard	G.8275.2/Y.1369.2 (2016) Amendment 1 (08/17)
Profile identifier	00-19-A7-02-01-00
Network Protocol	IPv4, IPv6
Network Communication Mode	Unicast
Timestamp Mode	2-step and 1-step
Delay Mechanism	End2End (two-way) and No Delay (one-way)
PTP Domain	[44 ... 3] 44 is default
Message Intervals	Sync Rate 1/s ... 128/s, Delay Request rate 1/s ... 128/s, Announce Rate 1/s ... 8/s
Other Settings	priority1 = 128, priority1 is ignored by alternate BMCA
Oregano Systems Product Support	syn1588® PTP Stack syn1588® PCIe NIC
syn1588® PTP Stack	Master and Slave mode supported
Special features	Alternate BMCA is used Peer delay must not be used
Remarks	

802.1AS Profile

Features	Modes/Range/Description
Standard	IEEE 802.1AS-2011
Profile identifier	00-80-C2-00-01-00
Network Protocol	Layer2
Network Communication Mode	Multicast
Timestamp Mode	2-step
Delay Mechanism	Peer-Peer
PTP Domain	0 is default
Message Intervals	Sync Rate 8/s, Peer Delay Request rate 1/s and Announce Rate 1/s
Other Settings	N/A
Oregano Systems Product Support	syn1588 [®] PTP Stack syn1588 [®] PCIe NIC
syn1588 [®] PTP Stack	Master and Slave mode supported OS: Linux only
Special features	
Remarks	

Enterprise Profile

Features	Modes/Range/Description
Standard	draft-ietf-tictoc-ntp-enterprise-profile-15
Profile identifier	00-00-5E-00-01-00
Network Protocol	Layer3 IPv4, IPv6
Network Communication Mode	Hybrid
Timestamp Mode	2-step and 1-step
Delay Mechanism	End-End
PTP Domain	0
Message Intervals	Sync Rate 1/s, Peer Delay Request rate 1/s and Announce Rate 1/s
Other Settings	N/A
Oregano Systems Product Support	syn1588 [®] PTP Stack syn1588 [®] PCIe NIC
syn1588 [®] PTP Stack	Master and Slave mode supported OS: Windows & Linux
Special features	
Remarks	