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Abstract

This document describes an example Conformance Class based on “60802-Steindl-ExampleSelections-0119-v02.pdf” as a starting point for feature alignment.
The parameters and values given in this document are presenting the ongoing discussions. Currently there is no agreement which attributes, parameters and values are mandatory within the profile.

Constraints

All features - if supported class is readable - all optional features and quantities need to be at run-time readable. Other wise the plug&work use cases trogether with the IA-ME are not possible.

Terms used in this document

Supported	This feature is used in any device
Supported but optional	This feature is intended to be used in some class of device. For silicon vendors, these topics may be “supported”, too.
Not used	The use and thus the support of this feature is not intended.
Ω / TBD	Not provided until agreed release date for this version.
---	No quantities, because the assigned feature is not supported.
???	The responsible editor is not able to fill this cell without a discussion with the other contributors.
Common	Column with the aligned requirements

Log

V 0.x	under construction
V 00a	Data migrated, ready for review
V 1.6	Migration of the tables from document 60802-Steindl-et-al-ExampleSelection-1119-v16.docx to this Excel File
V2.2	After one on one discussion with contributors (RA, MI, YO)
V2.3	Update on Pdelay in .1AS

Attribute	Classification	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"
MAU Types[1], Data rate											
10Mbps [Selectable for a device)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Supported but optional
100Mbps [Selectable for a device)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
1Gbps [Selectable for a device)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported but optional
2,5Gbps [Selectable for a device)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Not used
5Gbps [Selectable for a device)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Not used
10Gbps [Selectable for a device)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Not used
Maximum frame size 802.3 79.3.4.1	Quantity	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Link length[1]	Information	—	—	At least 100m	At least 100m	Depends on media	Depends on media	Depends on media	Depends on media	Depends on media	Depends on media
Preemption	Feature										
10Mbps[3]	Feature	Mandatory	Optional	Supported	Supported	Supported	Supported but optional	Supported	Not used	Not used	Not used
100Mbps	Feature	Mandatory	Optional	Supported	Supported	Supported	Supported but optional	Supported	Not used	Not used	Not used
1Gbps	Feature	Mandatory	Optional	Supported	Supported	Supported	Supported but optional	Supported	Not used	Not used	Not used
2,5Gbps	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not used	Not used	Not used
5Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not used	Not used	Not used
10Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not used	Not used	Not used
Connectors	Information	—	—	IEC 61784-5-3 / IEC 61158-2	IEC 61784-5-3 / IEC 61158-2	IEC 61784-5-2 / IEC 61158-2	IEC 61784-5-2 / IEC 61158-2	IEC 61784-5-8 / IEC 61158-2	IEC 61784-5-8 / IEC 61158-2	IEC 61784-5-10 / IEC 61158-2	IEC 61784-5-10 / IEC 61158-2 / IEC 61918
Cables	Information	—	—	IEC 61784-5-3 / IEC 61158-2	IEC 61784-5-3 / IEC 61158-2	IEC 61784-5-2 / IEC 61158-2	IEC 61784-5-2 / IEC 61158-2	IEC 61784-5-8 / IEC 61158-2	IEC 61784-5-8 / IEC 61158-2	IEC 61784-5-10 / IEC 61158-2	IEC 61784-5-10 / IEC 61158-2 / IEC 61918

Notes
[1] Attributes like full duplex, IEEE 802.1AS support, IEEE 802.1AB support, auto polarity, auto negotiation, synchronization error budget, to be supported link length are selection criteria for the MAU Types.
[2] ---
[3] Need to convince IEEE 802.3 to allow preemption for 10 Mbps also.

Attribute	Classification	Full-Blown Devices Example Selection “Common”	Constraint Devices Example Selection “Common”	Full-Blown Devices Example Selection “SI”	Constraint Devices Example Selection “SI”	Full-Blown Devices Example Selection “RA”	Constrained Devices Example Selection “RA”	Full-Blown Devices Example Selection “MI”	Constraint Devices Example Selection “MI”	Full-Blown Devices Example Selection “YO”	Constraint Devices Example Selection “YO”
Queues 802.1Q 8.6.6	Quantity	Eight	Eight	Eight	Eight	Eight	At least four	Eight	At least four	Eight	At least four
Preassigned PCPs	Information	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for isochronous/network management (PTP, DLR, STP), PCP: 6 for cyclic/network management (LLDP, YANG, SNMP) PCP: 5:0 for application dependent	Example: PCP:7 for isochronous/network management (PTP, DLR, STP), PCP: 6 for cyclic/network management (LLDP, YANG, SNMP) PCP: 5:0 for application dependent	Example: PCP:7 for Isochronous PCP:6 for cyclic PCP:5 for network control PCP:4 for config., diagnostics PCP:3-0 for other application	Example: PCP:7 for Isochronous PCP:6 for cyclic PCP:5 for network control PCP:4 for config., diagnostics PCP:0 for other application	Example: PCP:7 network management, PCP:6 C2D, PCP:5 C2C / C2Comp, PCP:4 alarm / event, PCP:3-0 for application dependent	Example: PCP:7 network management, PCP:6 C2D, PCP:5 C2C / C2Comp, PCP:4 alarm / event, PCP:3-0 for application dependent
VLAN Identification	Quantity	At least 8 VIDs Four for streams, rest for non-stream	At least 8 VIDs Four for streams, rest for non-stream	At least 8 VIDs Four for streams, rest for non-stream	At least 8 VIDs Four for streams, rest for non-stream	At least 8 VIDs Four for streams, rest for non-stream	At least 8 VIDs Four for streams, rest for non-stream	At least 8 VIDs	At least 8 VIDs	At least 8 VIDs	At least 8 VIDs
VLANs used for streams (FDB configuration)											
Learning disable	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Individual VLAN learning (IVL)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Supported
Default forwarding rule	Feature	Drop	Drop	Drop	Drop	Drop	Drop	Drop	Flooding	Drop	Drop
VLANs used for non-stream (FDB configuration)											
Learning enabled	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Supported
Shared VLAN learning (SVL)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Supported
Default forwarding rule	Feature	Flooding	Flooding	Flooding	Flooding	Flooding	Flooding	Flooding	Flooding	Flooding	Flooding
FDB size 802.1Q 8.8	Quantity										

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Streams static MC entries used for streams (e.g. 2048 MAC addresses used together with 4 VIDs)	Quantity	8192[1]	At least 4096	8192[1]	8192[1]	8192	4096	4096	16	16384[2]	1024[16]
Non-stream static/dynamic entries for remaining VLAN(s)	Quantity	2048	At least 4096	2048	2048	2048	1024	2048	16	16384[3]	1024[16]
Spanning tree 802.1Q 13											
For stream VLANs	Feature										
RSTP NOTE Does not work with VLANs	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Not used	Not Used	Supported but optional	Supported but optional
MSTP	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Not used	Not Used	Supported but optional	Supported but optional
For non-stream VLANs	Feature										
RSTP NOTE Does not work with VLANs	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not Used	Supported but optional	Supported but optional
MSTP	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not Used	Supported but optional	Supported but optional
Transmission selection control 802.1Q 8.6.8											
Strict priority	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Credit based shaper	Feature	Optional	Optional	Not used	Not used	Supported, but Optional	Supported, but Optional	Not used	Not Used	Supported, but Optional	Supported, but Optional
Scheduled traffic 802.1Q 8.6.9, 8.6.8.4											
Time aware shaper											
10Mbps	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not Used	Supported but optional	Supported but optional
100Mbps	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
1Gbps	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported	Supported	Supported	Supported but optional
2,5Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not Used	Supported but optional	Not used
5Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not Used	Supported but optional	Not used

Attribute	Classification	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"
10Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not Used	Supported but optional	Not used
Cyclic queuing and forwarding	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Not used	Not Used	Not used	Not used
Gate Control List entries 802.1Q 8.6.8.4	Quantity	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3
Tick granularity 802.1Q 8.6.8.4	Quantity	=< 10ns	=< 10ns	=< 10ns	=< 10ns	10ns	10ns	=< 10ns	=< 10ns	=< 100ns	=< 100ns
Number of Hold & Release events 802.1Q 12.30.1	Quantity	1 & 1	1 & 1	1 & 1	1 & 1	1 & 1	1 & 1	1 & 1	—	—	—
Admin Cycle Time range 802.1Q 8.6.8.4											
Application Cycle time (is a multiple of Admin Cycle Time / Network Cycle)	Information	---	---	250 µs / 31,25 µs to 1s	250 µs / 31,25 µs to 1s	Ω	Ω	31.25/250 µs to 1s	31.25/250 µs to 1s	10 ms to 1 s	10 ms to 1 s
100Mbps	Quantity	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 10 ms	250 µs to 10 ms	500 µs to 10 ms	=< 10ms
>=1Gbps	Quantity	31,25 µs to 1 ms	31,25 µs to 1 ms	31,25 µs to 1 ms	31,25 µs to 1 ms	31,25 µs to 1 ms	31,25 µs to 1 ms	31,25 µs to 10 ms	31,25 µs to 10 ms	500 µs to 1 ms	=< 1ms
Timing points for scheduled traffic 802.1Q 12.29.2[4]	Quantity	=< 10ns	=< 10ns	=< 10ns	=< 10ns	10ns	10ns	=< 10ns	=< 10ns	=< 100ns	=< 100ns
Maximum gap for transmission of consecutive frames[5]	Quantity	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG
Ingress rate limiter / Flow classification and metering 802.1Q 8.6.5 (MEF 10.3)											
Unicast (implemented as flow meters)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported but optional	Supported but optional
Multicast / Broadcast (implemented as flow meters)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported but optional	Supported but optional
Ingress filtering and policing (Qci) 802.1Q 8.6.5.1											
Number of streams	Quantity	—	—	—	—	4096	4096	256	—	8192	4096
Stream Gates 802.1Q 8.6.5.1.2	Feature	Optional	Optional	Not used	Not used	Supported but optional	Supported but optional	Not used	Not used	Not used	Not used
Number of stream gates	Quantity	—	—	—	—	8	8	—	—	—	---
Flow Meters 802.1Q 8.6.5.1.3	Feature	Supported	Supported	Supported	Supported	Supported but optional	Supported but optional	Supported	Not used	Supported but optional	Supported but optional

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Number of flow meters (e.g. one for Unicast and one for Multicast/Broadcast)	Quantity	2 × number of ports[6]	2 × number of ports[6]	2 × number of ports[6]	2 × number of ports[6]	2 × number of ports[6]	2 × number of ports[6]	8	—	8	4
Stream Filter 802.1Q 8.6.5.1.1	Feature	Optional	Optional	Not used	Not used	Supported but optional	Supported but optional	Supported	Not used	Supported but optional	Supported but optional
Ingress and egress frame modification											
Priority regeneration (PCP) 802.1Q 6.9.4	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Supported
VLAN stripping and adding 802.1Q 6.9 and 8.8.2	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Supported
Preemption								Supported	Not used	Not used	Not used
802.1Q 6.7.2											
First or non-final fragment size	Quantity	64	64	64	64	64	64	64	—	—	---
10Mbps	Feature	Mandatory	Optional	Supported	Supported	Supported	Supported but optional	Supported	Not used	Not used	Not used
100Mbps	Feature	Mandatory	Optional	Supported	Supported	Supported	Supported but optional	Supported	Not used	Not used	Not used
1Gbps	Feature	Mandatory	Optional	Supported	Supported	Supported	Supported but optional	Supported	Not used	Not used	Not used
2,5Gbps	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not used	Not used	Not used
5Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not used	Not used	Not used
10Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not used	Not used	Not used
Synchronized network access											
Start of cycle trigger[8] (Created out of Working Clock) Used for TAS (Bridge + end station) and synchronized network access (end station)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Per stream trigger 802.1Qcc 46.2.3.5.5 / 46.2.3.5.6	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but optional	Not used	Not used	Not used
Maximum gap for transmission of consecutive frames[9] IPG is by default 96bit times	Quantity	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG
Bridge / Forwarding resources[10]	Specify attributes for the resource management. Ensure buffering of stream and non-stream traffic during stream transmission										
Real-Time traffic[11]											
Stream High in-class interference											
>= 1Gbps	Quantity	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 300µs for an egress port	At least 16µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port
<= 100Mbps	Quantity	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 3ms for an egress port	At least 160µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port
Stream Low intra- and in-class interference											

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>= 1Gbps	Quantity	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 300µs for an egress port	At least 16µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port
<= 100Mbps	Quantity	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 3ms for an egress port	At least 160µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port
Non-real-Time traffic[12][13]											
>= 1Gbps[14]	Quantity	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 300µs for an egress port	At least 100µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port
<= 100Mbps[15]	Quantity	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 3ms for an egress port	At least 1ms for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port

[1] A minimum 2048 per VLAN
See "60802-Steindl-DA-MAC-Constraints-0718-v01.pdf"
[2] Only in sum 16384 entries – useable for streams and default VLAN(s)
[3] Only in sum 16384 entries – useable for streams and default VLAN(s)
[4] Minimum and maximum for the delay before the first frame is transmitted after gate open
[5] Getting the value for calculating window sizes
[6] If useable for ingress rate limiting fitting to the domain boundary requirements
[7] maxframesize/minframesize of a TSN domain. Is this value seen for the whole queue or just one frame? Given that there are holdAdvance and releaseAdvance events, then 2 x maxframesize/minframesize.
[8] Specified as a special case of the per stream trigger by using "time aware offset = 0" for all streams
[9] Getting the value for network calculus and calculating window sizes
[10] Model for resource calculation needed due to implementation dependency. What needs to be achieved? What is the goal?
[11] Both stream classes share the time limit; e.g. if only stream high is used, then 200µs are available for high. If only low is used, then 200µs are available for low. If both are used, then they need to share the 200µs.
[12] Stream and non-stream forwarding resources needs to be guaranteed.
[13] Having a time triggered network usage model requires to buffer non-stream traffic during the stream time period to avoid the deletion of the packet being synchronized with the application period.
[14] Length of the period of stream transmission at egress ports need to be protected against congestion lost. „Minimum of 25 Kbytes per port" is an equivalent of 200µs transmission period for 1Gbps.
[15] Length of the period of stream transmission at egress ports need to be protected against congestion lost. „Minimum of 6,25 Kbytes per port" is an equivalent of 500µs transmission period for 100Mbps.

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Configuration-Centralized												
Class based scheduling	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	IEEE 802.1Qdj (as successor or update to 802.1Qcc) shall cover these topics
Stream based scheduling	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	
path computation	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported	Supported	
network calculus	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported	Supported	
topology discovery	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported	Supported	
device network feature discovery	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported	Supported	
management protocol												
SNMP (if YANG Models are still missing)	Feature	Optional (Conditional)	Ω	Supported (Conditional)	Supported (Conditional)	Supported but optional	Supported but optional	Supported	Supported	Supported	Supported	if YANG is not avaible for needed managed objects, then this should not stop us releasing the IA-profile
MIBs	Quantity (List of MIBs)	Ω	Ω	Ω	Ω	—	—	Ω	Ω	???	???	
NETCONF / YANG	Feature	Mandatory	Ω	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported but optional	SI: Concerns about the NETCONF server's footprint & compute YO: Concerning NETCONF server's footprint on Constraint Devices
SSH	Feature	Optional	Ω	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	
TLS	Feature	Optional (Conditional)	Ω	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported	Supported	Supported	Supported but optional	
YANGs	Quantity (List of YANG modules)	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω	???	???	
NME capabilities												
CNC Election (making sure there is only one active CNC per domain)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported	Supported	IEEE 802.1Qdj (as successor or update to 802.1Qcc) shall cover these topics
Dynamic configuration	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported	Supported	
Standardized stream reservation request from end-stations	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported	Supported	
Number of supported streams	Quantity	8192	8192	8192	8192	8192	8192	4096	4096	8192	2048	
Number of devices (bridges and end-stations) per TSN domain	Quantity	1000	1000	1024	1024	1000	1000	1024	256	2048	512	

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Maximum number of TSN domain in one Layer2 broadcast domain (at max. 1024 nodes) (1024 / 64 = 16 devices per TSN domain)	Quantity	64	64	64	64	Ω	Ω	8	2	Ω	Ω

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Configuration-Distributed (M2M communication) LRP/RAP											
path computation	Feature	Optional	Optional	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported but optional	Supported but optional	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making
Standardized stream reservation request from end-stations	Feature	Optional	Optional	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Supported but optional	Supported but optional	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making	Definition of the feature is needed before decission making
Number of supported streams	Quantity	256	256	256	256	256	256	Ω	Ω	Ω	Ω
Number of devices (bridges and end-stations) per TSN domain	Quantity	128	128	128	128	Ω	Ω	Ω	Ω	Ω	Ω
Maximum number of TSN domain in one Layer2 broadcast domain (at max. 1024 nodes) (1024 / 64 = 16 devices per TSN domain)	Quantity	64	64	64	64	Ω	Ω	Ω	Ω	Ω	Ω

Attribute	Classification	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"	
TSN Domain TLV (IEEE802.1Q TLV or IEC/IEEE60802 TLV)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	
802.3 extension	Feature											
IEEE802.3 79.3.1 MAC/PHY Configuration/Status	Feature	Optional	Optional	Supported	Supported	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not an interoperability problem; but disallows detection of neighborhood errors
IEEE802.3 79.3.2 Power Via Medium Dependent Interface (MDI)	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Not used	Not used	
IEEE802.3 79.3.4 Maximum Frame Size	Feature	Optional	Optional	Supported	Supported	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not an interoperability problem; but disallows detection of neighborhood errors
IEEE802.3 79.3.7 Additional Ethernet Capabilities (Preemption)	Feature	Mandatory (Conditional)	Mandatory (Conditional)	Supported	Supported	Supported if preemption is supported	Supported if preemption is supported	Supported	Not used	Not used	Not used	
802.1 extension	Feature											
IEEE802.1Q Port VLAN ID	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	
IEEE802.1Q Port And Protocol VLAN ID	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	
IEEE802.1Q VLAN Name	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	
IEEE802.1Q Protocol Identity	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	
IEEE802.1Q VID Usage Digest	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	
IEEE802.1Q Management VID	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional	
802.1AB "Transmit on data change" (9.2.5.20 defined variable txNow := TRUE)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	
802.1AB "Topology Discovery"	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	

[1] we should also write something about txCredit>0. Anyway, why this sudden concentration on txNow? If LLDP is supported, the standard says:
"An LLDP agent shall conform to the specifications of each of the state machines indicated in Table 9-1 for the operating mode that it supports."
(just before chapter 9.1.1. from 802.1AB-2016)

Attribute	**Classification**	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"
Cut through forwarding	Forwarding latency optimization										
Delayed Cut-through[1]	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Not used	Not used
Direct Cut-through	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Not used	Not used	Not used	Not used
Enable Cut-through	Feature	Queue based	Queue based	Queue based	Queue based	Queue based	Queue based	Queue based	Queue based	Not used	Not used
Number of queues supporting it (Preemption disabled)	Quantity	All queues	All queue	8 (All queues)	8 (All queues)	8 (All queues)	8 (All queues)	8 (All queues)	4 (All queues)	—	—
Number of queues supporting it (Preemption enabled)	Quantity	All preemptive queues	All preemptive queues	All preemptive queues	All preemptive queues	All preemptive queues	All preemptive queues	All preemptive queues	Pre-emption not intended	—	—

[1] Not limited to port being free on receive. Packet is forward to the DST port as soon as the port is free. No need to wait for the complete packet reception

Attribute	Classification	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"		
Grandmaster PTP Instance	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional		
PTP End Instance	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported		
SyncLock mode	Feature	Mandatory (always Active)	Mandatory (always Active)	Supported (always Active)	Supported (always Active)	Ω	Ω	Ω	Ω	Supported	Supported	MI: Need to check	
Sync send interval													
Working Clock send interval System requirement |1µs| maximum deviation between Master and Slave	Quantity	31,25 ms	31,25 ms	31,25 ms	31,25 ms	31,25 ms	1 s	31,25 ms	31,25 ms	31,25 ms	1 s	RA: Check whether thats realy a topic for TSN Bridges and EndStations	<= 100Mbit/s +/-100ppm under all lifetime conditions of the used device
Global Time send interval System requirement |100µs| maximum deviation between Master and Slave	Quantity	125 ms	125 ms	125 ms	125 ms	125 ms	1 s	125 ms	125 ms	125 ms	1 s	Expected overall age of a sync message at the last hop : <=1s Blind time for the last hop : <=2s (+frame loss*1s) Additional error : 1s of "wrong" rate assumption at the last hop Convergence network issue! YO: Check whether 1s needs to stay	<= 1Gbit/s +/-50ppm under all lifetime conditions of the used device ... <=10Gbit/s +/-??ppm under all lifetime conditions of the used device
Pdelay send interval													
Pdelay send interval System requirement |1µs| maximum deviation between Master and Slave	Quantity	31,25 ms	31,25 ms	250 ms / 1 s	250 ms / 1 s	Ω	Ω	Ω	Ω	Ω	Ω	SI: 250 ms for the first 5 s - to speed up achieving required measurement quality. Later switch to the default value of 1 s.	
gPTP Domains													
Working Clock	Quantity	1	1	1	1	1	1	1	1	1	1		
Global Time	Quantity	1	1	1	1	1	1	1	1	1	1		
Seamless redundancy – Hot Standby	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Supported but optional	Supported but optional		
Working Clock	Quantity	1	1	1	1	—	—	1	1	1	1		
Global Time	Quantity	1	1	1	1	—	—	1	1	1	1		
BMCA Redundancy – Cold Standby	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported	Supported	Supported but optional	Supported but optional	Supported	Supported	SI: Check whether the definition for GlobalTime should be applied to WorkingClock, too Interoperability is covered by support of BMCA in bridges; PTP Grandmaster support of BMCA is optional; Limited to GlobalTime	
Externally Managed Sync Trees (YANG/MIB)	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported but optional	Supported but optional	Supported but optional	Supported but optional		
802.1AS "Announce"	Feature												
Working Clock	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported	Supported	Supported	Supported	Supported	Supported	Dependency to "BMCA" question	
Global Time	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported	Supported	Supported	Supported	Supported	Supported	Dependency to "BMCA" question	
802.1AS "Signal"	Feature												
gPTP capable	Feature	Optional	Optional	not used	not used	not used	not used	not used	not used	not used	not used		

Attribute	Classification	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"			
Stream identification	Selection out of a list within 802.1CB													
Null Stream (DMAC + TCI.VID based) 802.1CB 6.4	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported			
IP stream 802.1CB 6.7	Feature	Optional	Optional	Not used	Not used	Supported	Supported	Supported but optional	Not used	Supported	Supported		RA: Boundary or gateway feature to convert brownfield traffic into "null stream" identified streams inside the TSN domain	SI: What kind of products would use this feature? Maybe already required due to OPC FLC definitions?
1CB (Frame replication and elimination for reliability)	Feature													
FRER in bridges	Feature													
1CB TAG supported	Feature	Optional	Optional	Supported but optional[2]	Supported but optional[2]	Supported but optional	Supported but optional	Supported	Not used	Supported but optional	Supported but optional		No interoperability issue Customer product selection required	
HSR TAG supported	Feature	Optional	Optional	Supported but optional[3]	Supported but optional[3]	Not used	Not used	Supported but optional	Not used	Supported but optional	Supported but optional			
PRP Trailer supported	Feature	Optional	Optional	Supported but optional[4]	Supported but optional[4]	Supported but optional	Supported but optional	Supported but optional	Not used	Supported but optional	Supported but optional			
Vendor specific trailer supported	Feature	—	—	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used			
Number of streams	Quantity	—	—	—	—	4096	4096	4096	—	8000	2048		SI: Even if optional, number of streams need to be specified	
Stream translation	Selection out of a list within 802.1CB													
Active DMAC and VLAN identification														
802.1CB 6.6													Inter TSN Domain stream translation replacing DA-MAC, TCI.VID and TCI.PCP with a fitting value for the destination TSNDomain	
Ingress Port	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Not used	Supported	Supported			
Number of streams	Quantity	64 streams	64 streams	64	64	Ω	Ω	8	—	64	64		RA: Check for values	
Egress Port	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used			
Number of streams	Quantity	—	—	—	—	—	—	—	—	—	—			

[1] 8192 stream supported in a TSN Domain may be used for seamless redundancy which leads to 4096 redundant handled streams
[2] Only for network infrastructure components
[3] Only for network infrastructure components
[4] Only for network infrastructure components

Attribute	Classification	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	ConstraintedDevices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"	
IEC 62439-2 "MRP"												
MRP manager	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Not used	Not used	Not used	Not used	Expected to be NOT part of IEC 60802
MRP client	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Not used	Not used	Not used	Not used	No interoperability issue Customer product selection required
IEC 62439-3 "PRP" and "HSR"												
PRP	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but optional	Supported but optional	Not used	Not used	Supported but optional	Supported but optional	Expected to be NOT part of IEC 60802
HSR	Feature	Optional	Optional	Supported but optional	Supported but optional	Not used	Not used	Not used	Not used	Supported but optional	Supported but optional	No interoperability issue Customer product selection required
IEC 61158-x-2 **IEC 61784-2** **"DLR"**												
DLR	Feature	Optional	Optional	Not used	Not used	Supported but optional	Supported	Not used	Not used	Not used	Not used	Expected to be NOT part of IEC 60802 No interoperability issue Customer product selection required

Attribute	Classification	Full-Blown Devices Example Selection “Common”	Constraint Devices Example Selection “Common”	Full-Blown Devices Example Selection “SI”	Constraint Devices Example Selection “SI”	Full-Blown Devices Example Selection “RA”	Constrained Devices Example Selection “RA”	Full-Blown Devices Example Selection “MI”	Constraint Devices Example Selection “MI”	Full-Blown Devices Example Selection “YO”	Constraint Devices Example Selection “YO”	
Queues 802.1Q 8.6.6	Quantity	Eight	Eight	Eight	Eight	Eight	Four	Eight	Four	Eight	At least four	RA: Check whether eight queues for constrained is possible
Preassigned PCPs	Quantity	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for network mgmt., PCP:6 for High streams, PCP:5 for Low stream, PCP:4-2 for in domain, and PCP:1-0 for inter domain	Example: PCP:7 for isochronous/network management (PTP, DLR, STP), PCP: 6 for cyclic/network management (LLDP, YANG, SNMP) PCP: 5:0 for application dependent	Example: PCP:7 for isochronous/network management (PTP, DLR, STP), PCP: 6 for cyclic/network management (LLDP, YANG, SNMP) PCP: 5:0 for application dependent	Example: PCP:7 for Isochronous PCP:6 for cyclic PCP:5 for network control PCP:4 for config., diagnostics PCP:3-0 for other application	Example: PCP:7 for Isochronous PCP:6 for cyclic PCP:2 for network control PCP:1 for config., diagnostics PCP:0 for other application	Example: PCP:7 network management, PCP:6 C2D, PCP:5 C2C / C2Comp, PCP:4 alarm / event, PCP:3-0 for application dependent	Example: PCP:7 network management, PCP:6 C2D, PCP:5 C2C / C2Comp, PCP:4 alarm / event, PCP:3-0 for application dependent	
VLAN Identification	Quantity	At least 5 VIDs Four for streams, one for non-stream	At least 5 VIDs Four for streams, one for non-stream	At least 5 VIDs Four for streams, one for non-stream	At least 5 VIDs Four for streams, one for non-stream	At least 5 VIDs Four for streams, one for non-stream	At least 5 VIDs Four for streams, one for non-stream	At least 5 VIDs Four for streams, one for non-stream	At least 3 VIDs Two for streams, one for non-stream	At least 5 VIDs Four for streams, one for non-stream	At least 3 VIDs Two for streams, one for non-stream	MI: If constraint devices are mixed with full-blown, then only constraint functionality is available. YO: Stream High is not a requirements due to PA environment, at least for Constraint
VLANs used for streams	Quantity	2 + 2	2 + 2	2 + 2	2 + 2	2 + 2	2 + 2	2 + 2	1 + 1	2 + 2	1 + 1	
VLANs used for non-stream	Quantity	1	1	1	1	1	1	1	1	1	1	
Streams												
Representative number of total connections *EndStations may support more or less (based on PLC requirements)*	Quantity (Informative)	512	512	512	512	512	512	2048	512	200	200	
Number of streams transmitted	Quantity	512	512	512	512	512	512	2048	512	1000	1000	YO: Each of the different application cycles requires "its" stream
Number of streams received	Quantity	512	512	512	512	512	512	2048	512	1000	1000	
Non-stream connections	Quantity	512	512	512	512	256	256	1024	512	200	200	No interoperability issue!
Transmission selection control 802.1Q 8.6.8												
Strict priority	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	
Credit based shaper	Feature	Optional	Optional	Not used	Not used	Not Used	Not Used	Not Used	Not used	Supported, but optional	Supported but optional	
Scheduled traffic 802.1Q 8.6.9, 8.6.8.4												
Time aware shaper	Feature											
10Mbps	Feature	Optional	Optional	Supported	Supported	Supported	Supported	Supported but optional	Not used	Supported but optional	Supported but optional	
100Mbps	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	
1Gbps	Feature	Optional	Optional	Supported	Supported	Supported but optional	Supported but optional	Supported	Supported	Supported	Supported but optional	
2,5Gbps	Feature	Optional	Optional	Supported	Supported	Not used	Not used	Supported but optional	Not used	Supported, but optional	Not used	
5Gbps	Feature	Optional	Optional	Supported	Supported	Not used	Not used	Supported but optional	Not used	Supported, but optional	Not used	
10Gbps	Feature	Optional	Optional	Supported	Supported	Not used	Not used	Supported but optional	Not used	Supported, but optional	Not used	
Cyclic queuing and forwarding	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Not Used	Not used	Not used	Not used	
Gate Control List entries 802.1Q 8.6.8.4	Quantity	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	At least 3	
Tick granularity 802.1Q 8.6.8.4	Quantity	<= 10ns	<= 10ns	<= 10ns	<= 10ns	10ns	10ns	<= 10ns	<= 10ns	<= 100ns	<= 100ns	
Admin Cycle Time range 802.1Q 8.6.8.4	Quantity											
Application Cycle time (is a multiple of Admin Cycle Time / Network Cycle)	Information	---	---	250 µs / 25 µs / 31,25 µs to 1s	250 µs / 25 µs / 31,25 µs to 1s	Ω	Ω	31,25/250µs to 1s	31,25/250µs to 1s	10ms to 1s	10ms to 1s	MI: Wider range of network cycle needed (10ms instead of 1ms) This allows to avoid an Application cycle different from the Network cycle for some applications. Interoperability topic, if mandatory is only up to 1 ms.
100Mbps	Quantity	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 1 ms	250 µs to 10 ms	250 µs to 10 ms	500 µs to 10 ms	<= 10ms	
>=1Gbps	Quantity	31,25 µs to 1 ms	31,25 µs to 1 ms	25 µs / 31,25 µs to 1 ms	25 µs / 31,25 µs to 1 ms	31,25 µs to 1 ms	31,25 µs to 1 ms	31,25 µs to 10 ms	31,25 µs to 10 ms	500 µs to 1 ms	<= 10ms	
Timing points for scheduled traffic 802.1Q 12.29.2[1]	Quantity	<= 10ns	<= 10ns	<= 10ns	<= 10ns	10ns	10ns	<= 10ns	<= 10ns	<= 100ns	<= 100ns	

Attribute	Classification	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"	
Maximum gap for transmission of consecutive frames[2] IPG := 96 bit times	Quantity	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	
Preemption								Supported	Not used	Not used	Not used	
802.1Q 6.7.2												
First or non-final fragment size	Quantity	64	64	64	64	64	64	64	—	—	---	
Number of Hold & Release events	Quantity	2	2	2	2	2	2	2	—	—	---	
802.1Q 12.30.1												
10Mbps	Feature	Mandatory	Optional	Supported	Supported	Supported but Optional	Supported but Optional	Supported	Not used	Not used	Not used	Puts a higher burden on the customer, but can be handled by either "system provider profiles" or enhancements to the NME (being able to work with non-preemptive devices)
100Mbps	Feature	Mandatory	Optional	Supported	Supported	Supported but Optional	Supported but Optional	Supported	Not used	Not used	Not used	
1Gbps	Feature	Mandatory	Optional	Supported	Supported	Supported but Optional	Supported but Optional	Supported	Not used	Not used	Not used	Reason for not supporting it: Price and complexity
2,5Gbps	Feature	Optional	Optional	Supported but optional	Supported but optional	Supported but Optional	Supported but Optional	Supported but Optional	Not used	Not used	Not used	
5Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but Opptional	Not used	Not used	Not used	
10Gbps	Feature	Optional	Optional	Not used	Not used	Not used	Not used	Supported but Optional	Not used	Not used	Not used	
Synchronized network access												
Start of cycle trigger[3]	Feature	Mandatory	Mandatory	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	
Per stream trigger	Feature	Optional	Optional	Not used	Not used	Not Used	Not Used	Supported but Optional	Not used	Not used	Not used	
802.1Qcc 46.6.2.5.3.5												
Maximum gap for transmission of consecutive frames[4] IPG := 96 bit times	Quantity	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	IPG	
Transmission into the network												
Real-Time traffic												
Stream High in-class interference												
>= 1Gbps	Quantity	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 300µs for an egress port	At least 16µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port	
<= 100Mbps	Quantity	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 3ms for an egress port	At least 160µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port	
Real-Time trafficStream Low intra- and in-class interference												
>= 1Gbps	Quantity	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 300µs for an egress port	At least 16µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port	
<= 100Mbps	Quantity	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 3ms for an egress port	At least 160µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port	
Non real-time traffic												
>= 1Gbps	Quantity											
<= 100Mbps	Quantity	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 200µs for an egress port	At least 300µs for an egress port	At least 100µs for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port	
		At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 500µs for an egress port	At least 3ms for an egress port	At least 1ms for an egress port	Up to 500µs for an egress port	Up to 200µs for an egress port	
1CB (Frame replication and elimination for reliability)	Feature											
FRER in end station	Feature											
1CB TAG supported	Feature	Optional	Optional	Supported but optional[2]	Supported but optional[2]	Supported but optional	Supported but optional	Supported	Not used	Supported but optional	Supported but optional	No interoperability issue Customer product selection required
HSR TAG supported	Feature	Optional	Optional	Supported but optional[3]	Supported but optional[3]	Not used	Not used	Supported but Optional	Not used	Supported but optional	Supported but optional	
PRP Trailer supported	Feature	Optional	Optional	Supported but optional[4]	Supported but optional[4]	Supported but optional	Supported but optional	Supported but Optional	Not used	Supported but optional	Supported but optional	
Vendor specific trailer supported	Feature	Optional	Optional	Supported	Supported	Not used	Not used	Not Used	Not used	Not used	Not used	
Number of connections (cross reference to the total number of supported connections above) Assumes that seamless requires two streams per direction for each connection	Feature	256	256	256	256	—	—	2048	—	100	100	RA: What numbers are needed?

[1] Minimum and maximum for the delay before the first frame is transmitted after gate open

Attribute	**Classification**	Full-Blown Devices Example Selection "Common"	Constraint Devices Example Selection "Common"	Full-Blown Devices Example Selection "SI"	Constraint Devices Example Selection "SI"	Full-Blown Devices Example Selection "RA"	Constrained Devices Example Selection "RA"	Full-Blown Devices Example Selection "MI"	Constraint Devices Example Selection "MI"	Full-Blown Devices Example Selection "YO"	Constraint Devices Example Selection "YO"	

[2] Getting the value for calculating window sizes
[3] Specified as a special case of the per stream trigger by using "time aware offset = 0" for all streams
[4] Getting the value for network calculus and calculating window sizes
[5] An end-station may transmit fro this amount of time out of local memory