Supporting Materials for comment R1-169

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Comment R1-169

Cl **169**	*SC* **169.2.10**	*P* **210**	*L* **40**	# 169

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Comment Type **TR** *Comment Status* **X**

800GBASE-ER1 does not use the ILT and RTS functions. APSU is the result of establishing end to end communicatioin. ILT and RTS functions provide means to establish communication across ISLs, but are not required to do so (like in the case of ER1).

169.2.10 Autonomous path startup (APSU)

The autonomous path startup (APSU) functions are defined in Annex 178B. The inter-sublayer link training (ILT) function facilitates the orderly startup of an inter-sublayer link (ISL). The ready-to-send (RTS) function coordinates the startup of a series of ISLs along a path. Path and ISL are defined in 178B.3.

ILT and RTS functions are specified for use by the following PMD and AUI types:

- 800GAUI-4 C2C
- 800GAUI-4 C2M
- 800GBASE-KR4
- 800GBASE-CR4
- 800GBASE-DR4
- 800GBASE-FR4-500
- 800GBASE-DR4-2
- 800GBASE-FR4
- 800GBASE-LR4
- 800GBASE-LR1
- 800GBASE-ER1-20
- 800GBASE-ER1

187.5.11 Autonomous path startup (APSU) functions

APSU functions are supported by the 800GBASE-ER1 FEC sublayer (see 186.2).

Options on how to resolve this issue

1) Remove the 800GBASE-ER1* from the list in 169.2.10

2) Rephrase the description of APSU to support ER1 being in the list.

My suggested remedy proposes option 2 as I believe we want to maintain a list of PMDs that do support initializing the path with APSU in these introductory clauses. APSU is a new feature and many of the legacy PHYs based on older PMDs would not necessarily support it.

What is in the path? and what does startup entail?

Within the path, in addition to the ISLs, there are digital processing sublayers like the Inner FEC, PCS and PMA.

So for the “path” to startup (data flowing from RS to RS) the digital logic layers need to be operating as specified too.

1.4.455 path: The sequence of segments and repeaters providing the connectivity between two DTEs in a single collision domain. In CSMA/CD networks there is one and only one path between any two DTEs.

1.4.279 data terminal equipment (DTE): Any source or destination of data connected to the local area network.

178B.3 Path

The sequence of ISLs and intermediate sublayers providing the connectivity between two Reconciliation Sublayers (RSs). See Figure 178B–1.

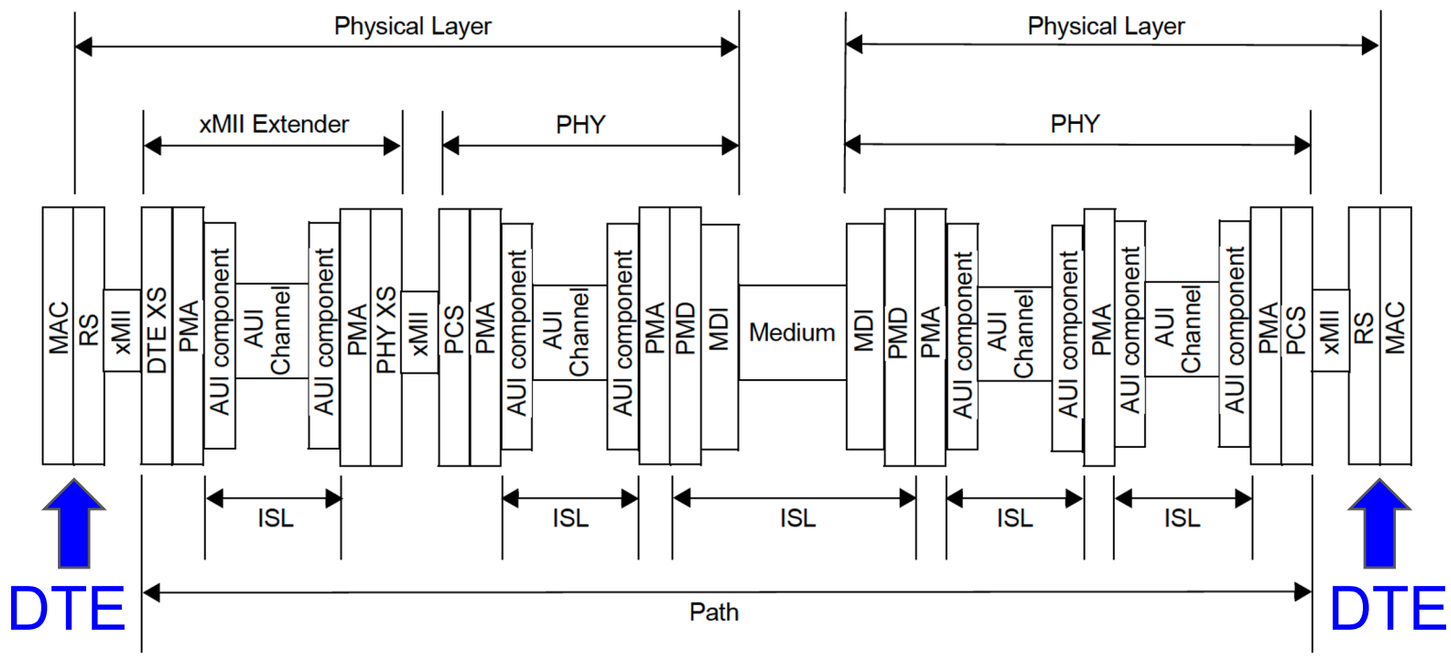

Figure 178B–1—ISL and Path

So what does APSU mean then?

Per 178B.4 “APSU is not intrinsically a function, it is an externally observable behavior”

I believe APSU should means it’s the result of ALL layers in the path processing data of the expected format. The observable behavior you’ll see is that the link fault signalling that occurs at startup is exited. When the link fault signalling stops that means the RS to RS communication path is established (DTE to DTE) and startup is complete.

Updated suggested changes

116.2.9 Autonomous path startup (APSU)
169.2.10 Autonomous path startup (APSU)
174.2.12 Autonomous path startup (APSU)

Autonomous path startup (APSU) is the coordinated, orderly initialization of all inter-sublayer links (ISLs) and sublayers in a path. This occurs when SIGNAL_OK reaches the OK value at every sublayer interface in both directions (see 178B.4). Path and ISL are defined in 178B.3.

Annex 178B defines the ready-to-send (RTS) and inter-sublayer link training (ILT) functions that facilitate establishing communication across ISLs found within the path. These functions are supported by many AUI components and PMDs that communicate across various types of medium.

Details of how each AUI component and PMD supports APSU are found in the relevant clauses.

APSU is specified for use by the following PMD and AUI types:

<existing list of PMD and AUI types in each clause>

169.2.10 Autonomous path startup (APSU)

The autonomous path startup (APSU) functions are defined in Annex 178B. The inter-sublayer link training (ILT) function facilitates the orderly startup of an inter-sublayer link (ISL). The ready-to-send (RTS) function coordinates the startup of a series of ISLs along a path. Path and ISL are defined in 178B.3.

ILT and RTS functions are specified for use by the following PMD and AUI types:

- 800GAUI-4 C2C
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- 800GBASE-DR4
- 800GBASE-FR4-500
- 800GBASE-DR4-2
- 800GBASE-FR4
- 800GBASE-LR4
- 800GBASE-LR1
- 800GBASE-ER1-20
- 800GBASE-ER1

existing text

Changes in 178B (deletions in ~~red~~, additions in blue)

178B.1 Scope

This annex defines ~~the~~ functions to support autonomous path startup (APSU) ~~functions~~ for Physical Layer implementations that include one or more inter-sublayer links (ISLs) (see 178B.3) with data rate of 200 Gb/s or higher per lane.

178B.2 Overview

APSU is the coordinated, orderly initialization of all ISLs and sublayers in a path (Figure 178B–1). APSU is facilitated by the combination of the ready-to-send (RTS) function and the inter–sublayer link training (ILT) function. APSU is described in 178B.4.

178B.4 Autonomous path startup

APSU is not intrinsically a function, it is an externally observable behavior resulting from ~~the RTS and ILT functions~~ establishing communication through all sublayers in the path in both directions. Support for APSU is defined as follows:
— An ISL ~~can be activated using APSU if~~ when the two interfaces and the associated sublayers (e.g. PMA, Inner FEC), implement the RTS function (see 178B.6) and the ILT function (see 178B.7), or have equivalent functions.
— A PHY ~~can be activated using APSU if~~ when every ISL and sublayer within the PHY ~~can be activated using~~ supports APSU.
— An xMII Extender ~~can be activated using APSU if~~ when every ISL and sublayer within it ~~can be activated using~~ supports APSU.
— A Physical Layer ~~can be activated using APSU if~~ when the PHY and xMII Extender (if implemented) ~~can be activated using~~ supports APSU.
— A path ~~can be activated using APSU if~~ when the Physical Layer at each end ~~can be activated using~~ supports APSU.

A path that does not meet the above criteria is not defined to support APSU. An ISL, PHY, Physical Layer, or path that ~~cannot be activated using~~ does not support APSU may be ~~activated~~ initialized using management or other means beyond the scope of this annex.

~~APSU is the result of each ISL in the path transitioning to DATA mode as follows:~~
~~— The local_rts variable at an interface indicates that the interface is ready to send data. An interface that uses this annex signals that it is ready to send to a peer interface via the transmitted signal, as specified in 178B.6. An interface signals that it is ready to send data to an adjacent sublayer via the inter-sublayer service interface.~~
~~— The remote_rts variable indicates that the peer interface is ready to send. An interface asserts remote_rts when the receive function detects RTS signaling; this indicates that local_rts is true in the peer interface.~~
~~— When both local_rts and remote_rts are true for an interface, it switches to DATA mode (tx_mode = DATA, see 178B.8.3.1).~~
~~— End-to-end communication is established when all interfaces in the path are in DATA mode.~~

APSU is the result of SIGNAL_OK for every sublayer interface reaching the OK status. This occurs when:
— Communication is established in both directions of each ISL. For AUI components and PMDs using the ILT and RTS functions, local_rts and remote_rts are both true.
— Each sublayer is receiving and transmitting data of the expected format.
— End-to-end communication between the RS sublayers is established.

Thank you

178B.4 Autonomous path startup

APSU is not intrinsically a function, it is an externally observable behavior resulting from ~~the RTS and ILT functions~~ establishing communication through all sublayers in path in both directions. Support for APSU is defined as follows:
— An ISL can be activated using APSU if the two interfaces and the associated sublayers (e.g. PMA, Inner FEC), implement the RTS function (see 178B.6) and the ILT function (see 178B.7), or have equivalent functions.
— A PHY can be activated using APSU if every ISL and sublayer within the PHY can be activated using APSU.
— An xMII Extender can be activated using APSU if every ISL and sublayer within it can be activated using APSU.
— A Physical Layer can be activated using APSU if the PHY and xMII Extender (if implemented) can be activated using APSU.
— A path can be activated using APSU if the Physical Layer at each end can be activated using APSU.

A path that does not meet the above criteria is not defined to support APSU. An ISL, PHY, Physical Layer, or path that cannot be activated using APSU may be activated using management or other means beyond the scope of this annex.

~~APSU is the result of each ISL in the path transitioning to DATA mode as follows:~~
~~— The local_rts variable at an interface indicates that the interface is ready to send data. An interface that uses this annex signals that it is ready to send to a peer interface via the transmitted signal, as specified in 178B.6. An interface signals that it is ready to send data to an adjacent sublayer via the inter-sublayer service interface.~~
~~— The remote_rts variable indicates that the peer interface is ready to send. An interface asserts remote_rts when the receive function detects RTS signaling; this indicates that local_rts is true in the peer interface.~~
~~— When both local_rts and remote_rts are true for an interface, it switches to DATA mode (tx_mode = DATA, see 178B.8.3.1).~~
~~— End-to-end communication is established when all interfaces in the path are in DATA mode.~~

APSU is the result of SIGNAL_OK for every sublayer interface reaching the OK status. This occurs when:
— Communication is established in both directions of each ISL. For AUI components and PMDs using the ILT and RTS functions, local_rts and remote_rts are both true.
— Each sublayer is receiving and transmitting data of the expected format.
— End-to-end communication between the RS sublayers is established.