Cl **34** *SC* **34.1.2** *P* **2** *L* **32** # 83

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **A**

During 802.3ap, it was decided to try and keep it separate from Clause 34 / 44, which has now resulted in issues with the verbiage remaining in these clauses.

See below text
This standard specifies a family of Physical Layer implementations. The generic term 1000 Mb/s MAC refers to any use of the 1000 Mb/s ISO/IEC 8802-3 CSMA/CD MAC (the Gigabit Ethernet MAC) coupled with any physical layer implementation.

The term 1000BASE-X refers to a specific family of physical layer implementations specified in Clause 36 through Clause 39. The 1000BASE-X family of physical layer standards has been adapted from the ANSI X3.230-1994 [B20] (Fibre Channel) FC-0 and FC-1 physical layer specifications and the associated 8B/10B data coding method. The 1000BASE-X family of physical layer implementations is composed of 1000BASE-SX, 1000BASE-LX, and 1000BASE-CX.

All 1000BASE-X PHY devices share the use of common PCS, PMA, and Auto-Negotiation specifications (see Clause 36 and Clause 37). The 1000BASE-T PHY (Clause 40) uses four pairs of balanced copper cabling, as specified in ISO/IEC 11801:1995 (Class D) and ANSI/EIA/TIA-568-A-1995 (Category 5), and
tested for the additional performance parameters specified in NSI/EIA/TIA-568-B1 Annex D. Clause 40 defines its own PCS, which does not use 8B/10B coding.

SuggestedRemedy

Change to proposed text (which has been drafted in the spirit of early decision on keeping Backplane easy to pull out)

This standard specifies a family of Physical Layer implementations. The generic term 1000 Mb/s MAC refers to any use of the 1000 Mb/s ISO/IEC 8802-3 CSMA/CD MAC (the Gigabit Ethernet MAC) coupled with any physical layer implementation.

The term 1000BASE-X refers to a specific family of physical layer implementations specified in Clause 36 through Clause 39 and Clause 70. The 1000BASE-X family of physical layer standards has been adapted from the ANSI
X3.230-1994 [B20] (Fibre Channel) FC-0 and FC-1 physical layer specifications and the associated 8B/10B data coding method. The 1000BASE-X family of physical layer implementations is composed of 1000BASE-SX, 1000BASE-LX, 1000BASE-CX, and 1000BASE-KX. 1000BASE-KX is specific to Ethernet operation over electrical backplanes (See Clause 69).

This clause is specific to 1000 Mb/s MAC operation with 1000BASE-SX, 1000BASE-LX, and 1000BASE-CX devices, which share the use of common PCS, and PMA specifications and Auto-Negotiation specifications (see Clause 36 and Clause 37). The 1000BASE-T PHY (Clause 40) uses four pairs of balanced copper cabling, as specified in ISO/IEC 11801:1995 (Class D) and NSI/EIA/TIA-568-A-1995 (Category 5), and tested for the additional performance parameters specified in ANSI/EIA/TIA-568-B1 Annex D. Clause 40 defines its own PCS, which does not use 8B/10B coding.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

[1] Change the text to read:

This standard specifies a family of Physical Layer implementations. The generic term 1000 Mb/s MAC refers to any use of the 1000 Mb/s IEEE 802.3 MAC (the Gigabit Ethernet MAC) coupled with any physical layer implementation.

The term 1000BASE-X refers to a specific family of physical layer implementations specified in Clause 36 through Clause 39 and Clause 70. The 1000BASE-X family of physical layer standards has been adapted from the ANSI
X3.230-1994 [B20] (Fibre Channel) FC-0 and FC-1 physical layer specifications and the associated 8B/10B data coding method. The 1000BASE-X family of physical layer implementations is composed of 1000BASE-SX, 1000BASE-LX, 1000BASE-CX, and 1000BASE-KX.

This clause is specific to 1000 Mb/s MAC operation with 1000BASE-SX, 1000BASE-LX, and 1000BASE-CX devices, which share the use of common PCS, and PMA specifications and Auto-Negotiation specifications (see Clause 36 and Clause 37). The 1000BASE-T PHY (Clause 40) uses four pairs of balanced copper cabling, as specified in ISO/IEC 11801:1995 (Class D) and NSI/EIA/TIA-568-A-1995 (Category 5), and tested for the additional performance parameters specified in ANSI/EIA/TIA-568-B1 Annex D. Clause 40 defines its own PCS, which does not use 8B/10B coding. 1000BASE-KX is specific to Ethernet operation over electrical backplanes (See Clause 69).

[2] Add the use of IEEE 802.3 MAC, as opposed to CSMA/CD MAC, to the IEEE 802.3 dictionary.

Cl **34** *SC* **34.1.4** *P* **3** *L* **18** # 84

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **A**

Handling of merging of 802.3ap has left some inconsistencies in Clause 34 / 44.

See verbiage below -
34.1.4 Auto-Negotiation, type 1000BASE-X
Auto-Negotiation (Clause 37) provides a 1000BASE-X device with the capability to detect the abilities (modes of operation) supported by the device at the other end of a link segment, determine common abilities, and configure for joint operation. Auto-Negotiation is performed upon link startup through the use of a special sequence of reserved link codewords. Clause 37 adopts the basic architecture and algorithms from Clause 28, but not the use of fast link pulses.

SuggestedRemedy

Add sentence at end -

Auto-Negotiation for 1000BASE-KX is defined in Clause 73.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Will add the sentence 'Backplane Auto-Negotiation defined in Clause 73 applies to 1000BASE-KX.'.

Cl **36** *SC* **36.1.1** *P* **33** *L* **9** # 85

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **A**

Related to merger of 802.3ap into document has created issues -

This clause specifies the Physical Coding Sublayer (PCS) and the Physical Medium Attachment (PMA) sublayer that are common to a family of 1000 Mb/s Physical Layer implementations, collectively known as 1000BASE-X. There are currently three embodiments within this family: 1000BASE-CX, 1000BASE-LX, and 1000BASE-SX. The 1000BASE-CX embodiment specifies operation over a single copper media: two pairs of 150 ⌟ balanced copper cabling. 1000BASE-LX specifies operation over a pair of optical fibers using long-wavelength optical transmission. 1000BASE-SX specifies operation over a pair of optical fibers using short-wavelength optical transmission. The term 1000BASE-X is used when referring to issues common to any of the subvariants.

While it is assumed that this was done to keep 802.3ap stand-alone, Clause 70 states that Clause 36 is required, therefore Clause 36 needs to be modified to handle these references.

SuggestedRemedy

Replace with

This clause specifies the Physical Coding Sublayer (PCS) and the Physical Medium Attachment (PMA) sublayer that are common to a family of 1000 Mb/s Physical Layer implementations, collectively known as 1000BASE-X. There are currently four embodiments within this family: 1000BASE-CX, 1000BASE-KX, 1000BASE-LX, and 1000BASE-SX. The 1000BASE-CX embodiment specifies operation over a single copper media: two pairs of 150 ⌟ balanced copper cabling. The 1000BASE-CX embodiment specifies operation over an electrical backplane. 1000BASE-LX specifies operation over a pair of optical fibers using long-wavelength optical transmission. 1000BASE-SX specifies operation over a pair of optical fibers using short-wavelength optical transmission. The term 1000BASE-X is used when referring to issues common to any of the subvariants.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Will add 1000BASE-KX to list as suggested and will also change 'The 1000BASE-CX embodiment specifies operation over a single copper media: two pairs of 150 ..' to read 'The 1000BASE-CX embodiment specifies operation over two pairs of 150 ..'

Cl **36** *SC* **36.2.4.13** *P* **47** *L* **35** # 106

Thaler, Pat — Broadcom

Comment Type **TR** *Comment Status* **R**

Treatment of alignment of the start delimiter is inconsistant between 1 Gb/s and 10 Gb/s Ethernet. In 1 Gb/s, the alignment is done by allowing an octet of preamble to be dropped if it overlaps the end of an /I/ and overwritting the next octet with /S/. In 10 Gb/s the full preamble is preserved by delaying the start of the preamble by up to 3 octets when necessary for alignment.

Allowing an option for a 1 Gb/s PHY to behave in a manner similar to a 10 Gb/s PHY will cause no problems. It produces at most 1 octet of IPG shrinkage but IPG shrinkage can occur from clock compensation and must be tolerated.

SuggestedRemedy

Add, "Alternatively, when TX_EN is asserted during transmission of an ordered_set, the PCS may delay the packet to align the first octet of preamble to after the ordered_set and replace that octet with SPD."

Response *Response Status* **W**

REJECT.

The state diagram, which takes precedence over this text, requires that /T/ be sent when TX_EN is de-asserted. If a FIFO were added in front of the TX state machine the last byte of the CRC would be over written by the /T/. To insert the proposed text without introducing ambiguity would require changes to the state diagram.

---000---

First motion

Proposed REJECT.

Proposed response text. The state machine specifies operation the other way and the state machine would have precedence over this text.

Y: 4 N: 2 A: 8

Cl **37** *SC* **37.1.1** *P* **81** *L* **8** # 86

D'Ambrosia, John — Force10 Networks

Comment Type **ER** *Comment Status* **A**

Merger of 802.3ap has created issues with existing text -

Clause 37 describes the 1000BASE-X Auto-Negotiation (AN) function that allows a device (local device) to advertise modes of operation it possesses to a device at the remote end of a link segment (link partner) and to detect corresponding operational modes that the link partner may be advertising.

Furhtermore, it is noted in Clause 73 - "It is recommended that a device that has negotiated 1000BASE-KX operation through this clause not perform Clause 37 Auto-Negotiation." (Clause 73.1 Page 453, L36), which would seem to suggest to not point to Clause 37 AN for 1000BASE-KX, which also does not specify Clause 37 as optional in Table 70-1.

SuggestedRemedy

change to
Clause 37 describes the Auto-Negotiation (AN) function for 1000BASE-LX, 1000BASE-SX, and 1000BASE-CX that allows a device (local device) to advertise modes of operation it possesses to a device at the remote end of a link segment (link partner) and to detect corresponding operational modes that the link partner may be advertising. Use of "1000BASE-X" in this clause refers to 1000BASE-LX, 1000BASE-SX, and 1000BASE-CX physical sublayers.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Clause 37 is optionally allowed for 1000BASE-KX. Instead will add the text 'Backplane Auto-Negotiation defined in Clause 73 applies to 1000BASE-KX.'.

Cl **48** *SC* **48.1** *P* **229** *L* **7** # 88

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **A**

Integration of 802.3ap into document has resulted in issues -

This clause specifies the Physical Coding Sublayer (PCS) and the Physical Medium Attachment (PMA) sublayer that are common to a family of 10 Gb/s Physical Layer implementations, collectively known as 10GBASE-X. The 10GBASE-LX4 PMD described in Clause 53 and 10GBASE-CX4 PMD described in
Clause 54 are members of the 10GBASE-X PHY family.

SuggestedRemedy

change to
This clause specifies the Physical Coding Sublayer (PCS) and the Physical Medium Attachment (PMA) sublayer that are common to a family of 10 Gb/s Physical Layer implementations, collectively known as 10GBASE-X. The 10GBASE-X PHY family consists of 10GBASE-CX4 (See Clause 54), 10GBASE-KX4 (See Clause 71), and 10GBASE-LX4 (see Clause 53).

Response *Response Status* **W**

ACCEPT.

Cl **48** *SC* **48.1.3.3** *P* **231** *L* **26** # 89

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **A**

Integration of 802.3ap

10GBASE-X supports the PMD sublayer and MDI specified in Clause 53 and Clause 54. The 10GBASE-LX4 and 10GBASE-CX4 PMDs perform the following functions:

SuggestedRemedy

change to
10GBASE-X supports the PMD sublayer and MDI specified in Clause 53, Clause 54, and Clause 71. The 10GBASE-CX4, 10GBASE-KX4, and 10GBASE-LX4 perform the following functions:

Response *Response Status* **W**

ACCEPT.

Cl **48** *SC* **48.2.4.2.3** *P* **240** *L* **2** # 49

Brad, Booth AMCC

Comment Type **TR** *Comment Status* **A**

There is a double "shall". The first shall applies to the list, and the second applies to the item d. Item d shall needs to be removed.

SuggestedRemedy

Change:
... shall not be deleted.
to be:
... are not deleted.

Response *Response Status* **W**

ACCEPT.

Cl **48** *SC* **48.7.4.x** *P* **260** *L* **1** # 93

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **R**

Table at top looks to be for AN function, but no clause title.

SuggestedRemedy

add clause title above top table and re-order as appropriate

Response *Response Status* **W**

REJECT.

This table spans a page break - the title is at the start of the table on the previous page.

Cl **70** *SC* **70.3** *P* **383** *L* **37** # 132

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **A**

The PMD clause is trying to impose a 'shall' on a PCS. That is outside of its power. Also this violates layering because the PCS is not directly connected to the PMD, it's connected to the AN sublayer (see Fig, 73-1; the old Clause 37 AN is different, it is presented as part of the PCS). In principle, this clause could contain an informative NOTE that reminds the reader of a requirement on something else, made by another clause (or document). But I can't see any point in this case. The main issue is the wish to enforce Clause 73 AN with this PMD, which is addressed in 70.1.

SuggestedRemedy

Delete subclause 70.3 and associated PICS 70.10.4. Similarly delete 72.3, 72.10.4.1, 71.3, 71.10.4.1.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

[1] Change 70.3 to read 'The PCS associated with this PMD is required to support the AN service interface primitive AN_LINK.indication as defined in 73.9. (See 36.2.5.2.7.).'

[2] Remove subclause 70.10.4.1 (PICS).

Cl **72** *SC* **72.3** *P* **399** *L* **45** # 137

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **R**

This sentence 'In order to form a complete PHY, a PMD shall be combined with the appropriate sublayers' attempts to impose a condition on a complete PHY - but this clause is responsible for the PMD alone. The PMD is the lowest sublayer, not responsible for anything above it. Also there is no requirement to combine, merely to connect. If it is thought necessary to define what makes up a complete PHY of any name, then it must be done somewhere else e.g. using Table 69-1

SuggestedRemedy

Change to ''When {forming|part of} a complete PHY, a PMD is connected to the appropriate sublayers'. Same change for 71.1, 72.1. 53.1.

Response *Response Status* **W**

REJECT.

This was discussed during the balloting of IEEE P802.3ap and this was the consensus of the IEEE P802.3ap Task Force.

M: Thaler
S: Grow

Y: 6 N: 1 A: 0