Cl **1** *SC* **1.4** *P* **22** *L* **16** # 251

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

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

The term "DWDM channel" has been updated to address 802.3cs, but a search of the draft via the adobe search tool did not reveal its use anywhere else besides 1.4. If it is not being used then the update to the definition should be deleted

SuggestedRemedy

Delete update to 1.4.237b DWDM Channel defition.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Strike 1.4.237b

Change definition 1.4.160a as follows

1.4.160a black link approach: The specification of the input, output, and transfer characteristics of the unidirectional transmission path, without specifying how the transmission path is implemented:
a) from TP2 to TP3 for a given DWDM channel within a DWDM black link (see, for example, IEEE Std 802.3, Clause 154, Figure 154–3),
b) from MDI to MDI for a given Super-PON channel within a Super-PON black link (see for example, IEEE Std 802.3, Clause 164, Figure 164-3).

Cl **1** *SC* **1.4.275a** *P* **22** *L* **40** # 257

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A**

Free Spectral Range

SuggestedRemedy

free spectral range (as in 1.5 below)

Response *Response Status* **C**

ACCEPT.

Cl **164** *SC* **164.2.1** *P* **43** *L* **13** # 252

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

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

The following terms are identified with defitiions but have not been added to 1.4: Super-PON PMDs, symmetric Super-PON PMDs, asymmetric Super-PON PMDs

SuggestedRemedy

add defintions to 1.4
SuperPON PMDs - Family of PMDs that address point-to-multipoint (P2MP) networks, operating at a MAC data rate of 10 Gb/s in the downstream direction and at a MAC data rate of 10 Gb/s or 2.5 Gb/s in the upstream direction. See Clause 164.
Symmetric Super PON PMDs - Family of Super PON PMDs supporting the upstream MAC data rate of 10 Gb/s. See Clause 164.
Asymmetric Super PON PMDs - Family of Super PON PMDs supporting the upstream MAC data rate of 2.5 Gb/s. See Clause 164.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

add defintions to 1.4
Super-PON PMDs - Family of PMDs that address point-to-multipoint (P2MP) networks, operating at a MAC data rate of 10 Gb/s in the downstream direction and at a MAC data rate of 10 Gb/s or 2.5 Gb/s in the upstream direction. See Clause 164.
Symmetric Super-PON PMDs - Family of Super-PON PMDs supporting the upstream MAC data rate of 10 Gb/s. See Clause 164.
Asymmetric Super-PON PMDs - Family of Super-PON PMDs supporting the upstream MAC data rate of 2.5 Gb/s. See Clause 164.

Cl **164** *SC* **164.2.4.2** *P* **47** *L* **9** # 250

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *black link*

In Figure 164-3 the border of the Black Link (which should be DWDM Black Link) appears to be at the MDI's but this is different than what is shown in other figures where the MDI is at fiber that then connects to the DWDM Black Link. However, there is also test points at the MDI and inside the DWDM Black Link (TP7 / TP2 and TP6 / TP3). The difference in locations between these pairs of test points is unclear. Also how can you specify anything inside the DWDM BLack Link, which is done with the black link approach?

SuggestedRemedy

Show fiber to the MDI's that then connects to the DWDM Black Link.
Define where the noted test points exiist (some sort of cable length?

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The draft already states that "patch cord (TP2 for the downstream channel and TP6 for the upstream channel), between 2 m and 5 m in length," is used as the MDI connector. This text is in line with what was used in .3av, .3cs, and other access standards. No changes to text are needed.

Rename "164.2.8 Black link specification" to "164.2.8 Super-PON Black Link specification"

Shrink "Black Link" box in Figure 164–3 to the way it was in D2.1.

Add in Figure 164–3 an bidi arrow from ONU to OLT MDI and call it "Super-PON optical path"

Change all remaining instances of "Black Link" to "Super-PON Black Link" in the whole draft.

Cl **164** *SC* **164.2.4.2** *P* **47** *L* **11** # 253

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

Comment Type **ER** *Comment Status* **A** *black link*

In Figure 164-3 the term Black Link is used incorrectly - black link approach is how this part of the medium is specified

SuggestedRemedy

Change "Black Link" to "DWDM Black Link"

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change "Black Link" to "Super-PON Black Link"

Cl **164** *SC* **164.2.5** *P* **49** *L* **11** # 254

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

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

Table 164-4 issues
1. Channel is noted as "operating transmit channel" in 45.2.1.23a.1a
2. Every column, except C-band1 (downstream) Frequency - appears to be approximate, as the frequency is only specified to 3 significant figures.
3. It appears that C-Band 1 (downstream) frequencies are part of a DWDM frequency grid defined in ITU-T G.694.1. I don't see this specified anywhere. What about the other frequencies - are they part of another specified grid?

SuggestedRemedy

1. Choose a consistent name for Table 164-4 and 45.2.1.23a.1a
2. add "Approximate" in each column header
3. add references where appropriate to defined grids - either in table or body of text

Response *Response Status* **C**

REJECT.

The grid in Table 164-4 is not defined anywhere else, since it depends on the properties of the AWG. One of the FSR (C-band 1 (downstream)) aligns with ITU-T G.694.1.

Cl **164** *SC* **164.2.6.1** *P* **49** *L* **36** # 260

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A**

Make it easier to look things up

SuggestedRemedy

Add "OLT" and ONU" to four subclause headings 164.2.6.1, 164.2.6.2, 164.2.7.1 and 164.2.7.2, as is already done for the four tables, e.g. 164.2.6.1 OLT transmitter optical specifications

Response *Response Status* **C**

ACCEPT.

Cl **164** *SC* **164.2.6.2** *P* **50** *L* **46** # 258

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A**

See 1.2.6, Accuracy and resolution of numerical quantities, and guidance to editors

SuggestedRemedy

Change 6.0 to 6

Response *Response Status* **C**

ACCEPT.

Cl **164** *SC* **164.2.7.2** *P* **52** *L* **21** # 259

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A**

The ONU receives from the OLT

SuggestedRemedy

Change "ONU transmitter extinction ratio of 6.0 dB" to "OLT transmitter extinction ratio of 8.2 dB".

Response *Response Status* **C**

ACCEPT.

Cl **164** *SC* **164.2.11.2** *P* **59** *L* **3** # 249

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

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

The following is stated - The MDI is the interface between the PMD and the “fiber optic cabling” as shown in Figure 164–3. This is not correct, per 1.4.324 Medium Dependent Interface (MDI), which states "
The mechanical and electrical or optical interface between the transmission medium and the MAU (e.g., 10BASE-T) or the PHY (e.g., 1000BASE-T) and also between the transmission medium and any associated (optional per IEEE Std 802.3, Clause 33) Powered Device (PD) or Endpoint Power Sourcing Equipment (PSE).

SuggestedRemedy

Change sentence to "The MDI is the interface between the PMD and the PON medium, as shown in Figure 164–3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change sentence to "The MDI is the interface between the PMD and the PON medium, as shown in Figure 164–2."

Cl **164** *SC* **164.4.1** *P* **73** *L* **30** # 255

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

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

In Figure 164-7, The label of the MII is difficult to read, and shouldn’t' it be XGMII

SuggestedRemedy

correct the label. Usually done by pulling the label outside of the box and then pointing to it. Example 154-1 look at CGMII

change in all layer diagrams accordingly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the label "xMII[0]" to "xMII" and bring it outside the box, with arrow pointing to xMII.

Cl **164** *SC* **164.5.2.1** *P* **81** *L* **7** # 246

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

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

The scope of this project per its online PAR reads, "This amendment adds physical layer specifications and management parameters for optical subscriber access supporting point-to-multipoint operations using wavelength division multiplexing over an increased-reach (up to at least 50 km) passive optical network (PON."

However, in Fig 164-11, it is noted that the MPMC (see 164.5), which is part of the data link layer, is included in this specification. This is not within the current stated scope of the project.

SuggestedRemedy

The PAR for the project should be modified to include " It also extends the operation of Ethernet Passive Optical Networks (EPON) protocols, such as MultiPoint Control Protocol (MPCP) and Operation Administration and Management (OAM)."

Reference - https://www.ieee802.org/3/ca/documents/P802_3ca_PAR_approved.pdf

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Multipoint MAC Control comprises three management functions necessary for an EPON PHY to operate: a) Discovery Processing, this function manages the discovery process, through which an ONU is discovered and registered with the network while compensating for RTT; b) Report Processing, this function manages the generation and collection of report messages, through which bandwidth requirements are sent upstream from the ONU to the OLT, and; c) Gate Processing, this function manages the generation and collection of gate messages, through which multiplexing of multiple transmitters is achieved.

The scope of the IEEE P802.3cs PAR says that 'This amendment adds physical layer specifications and management parameters for optical subscriber access supporting point-to-multipoint operations using wavelength division multiplexing over an increased-reach (up to at least 50 km) passive optical network (PON).'. As a result, the addition of management parameters to Multipoint MAC Control is within the scope of the IEEE P802.3cs project. The scope of the changes to Multipoint MAC Control, comprising of the MAC Control Sublayer and Multipoint Control Protocol (MPCP), included in the IEEE P802.3cs draft is limited to the addition of management parameters to support super-PON, and are therefore within the scope of the PAR.

802.3cs does not extend the operation of the MAC Control sublayer. Of all the PON-related standards in 802.3, the Super-PON is the only one that did not redefine the MAC Control. All it did was to change the values of a few variables to down-rate the existing C144 MAC Control from 25G/25G + 25G/10G operation to 10G/10G + 10G/2.5G operation. All the MAC Control sublayer block diagrams, message formats, protocol behavior, and state diagrams are only defined in C144. In fact, the same approach is taken with Super-PON RS, PCS, and PMA sublayers. They all just show new variable definitions and the text showing new data rates / line rates where needed. All together, the RS, PCS, PMA, and MAC Control subclauses in Super-PON just take 25 pages, while the corresponding specifications in 802.3ca are 118 pages, not counting the associated annexes. In Super-PON, the PMD clause is the only new sublayer.

No changes to the PAR needed.

To better emphasize the connection between Clause 144 and 164.5, change text
The Super-PON Multipoint MAC Control Sublayer is based on the Nx25G-EPON Multipoint MAC Control Sublayer (see Clause 144) with scaled down speeds and support for only one ONU channel.
164.5 defines the mechanisms and control protocols required in order to reconcile Super-PON point-to-multipoint (P2MP) networks (see 164.1) into the Ethernet framework.

To

The Super-PON Multipoint MAC Control Sublayer is based on the Nx25G-EPON Multipoint MAC Control Sublayer (see Clause 144) with scaled down speeds and support for only one ONU channel.
>>164.5 updates the management parameters in Clause 144 to define<< the mechanisms and control protocols required in order to reconcile Super-PON point-to-multipoint (P2MP) networks (see 164.1) into the Ethernet framework.

Cl **164** *SC* **164.5.2.1** *P* **81** *L* **22** # 248

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

Comment Type **TR** *Comment Status* **A** *black link*

The noted PON medium includes "Black Link" per Fig 164-11. This does not align with 802.3ct, which is standard in-force, or updated terminology for 802.3cs. "Black link" is actually short for the methodology to define this part of the medium. This medium should be noted as "DWDM Black Link"

SuggestedRemedy

Change Black link to DWDM Black Link in all layer diagrams

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change "Black link" to "Super-PON Black Link" in all layer diagrams

Cl **164** *SC* **164.5.2.1** *P* **81** *L* **32** # 247

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

Comment Type **E** *Comment Status* **R**

The layer diagram references the respective layers throughout the diagram. It is not typical practice within the 802.3 specification to do this.

SuggestedRemedy

Delete all references to the respective clauses for the noted layers. This should be done for all such layer diagrams within the draft.

Response *Response Status* **C**

REJECT.

This approach was used in all EPON clauses to date and has been found useful. No changes needed

Cl **164A** *SC* **164A.1** *P* **96** *L* **6** # 256

Dambrosia, John Futurewei, A U.S. Subsidiary of Huawei

Comment Type **ER** *Comment Status* **A** *black link*

Use of black link terminology is incorrect

SuggestedRemedy

Change Black link to DWDM Black Link in all respective places in this annex

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change "Black link" to "Super-PON Black Link" in all respective places in this annex

Cl **164A** *SC* **164A.5.3** *P* **103** *L* **6** # 261

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A**

Suggested improvements for Figure 164A-4

SuggestedRemedy

"Pen" should be spelled out twice.
Units are generally in round brackets.
Colour should not be used if not necessary for clarity/comprehension.
x axis should be at bottom of graph.
Trailing zeros should not be included.
While you are there: "DS" could be written out in full.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Spell out "Pen" twice.
Put units in round brackets.
Move X axis to the bottom of graph.
Remove trailing zeros from the X axis values
Spell out DS and US terms.