Cl **FM** *SC* **FM** *P* **1** *L* **11** # 1

Hajduczenia, Marek Charter Communicatio

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

Match new PAR title

SuggestedRemedy

Change "Physical Layer Specifications and Management Parameters for 25 Gb/s, 50 Gb/s, and 100 Gb/s Passive Optical Networks" to "Physical Layer Specifications and Management Parameters for 25 Gb/s and 50 Gb/s Passive Optical Networks" to match the new PAR as approved by TF in September 2018
The same change on page 19

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **8** *L* **13** # 3

Hajduczenia, Marek Charter Communicatio

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

Update the name of the TF accordingly

SuggestedRemedy

Change "100G-EPON Task Force" to "25&50G-EPON Task Force"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "100G-EPON Task Force" to "Nx25G-EPON Task Force"

Cl **00** *SC* **0** *P* **1** *L* **17** # 119

Powell, Bill Nokia

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

Now that the PAR, CSD, and project objectives have been changed to remove 100G, it's time to change the title of our Draft D1.3 to drop 100G.

SuggestedRemedy

Change the current draft title from:
Draft Standard for Ethernet
Amendment:
Physical Layer Specifications and
Management Parameters for 25 Gb/s,
50 Gb/s, and 100 Gb/s Passive Optical
Networks

to:
Draft Standard for Ethernet
Amendment:
Physical Layer Specifications and
Management Parameters for 25 Gb/s and
50 Gb/s Passive Optical Networks

Response *Response Status* **C**

ACCEPT.

See comment #1

Cl **00** *SC* **0** *P* **19** *L* **11** # 120

Powell, Bill Nokia

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

Now that the PAR, CSD, and project objectives have been changed to remove 100G, it's time to change the title of our Draft D1.3 to drop 100G.

SuggestedRemedy

Change the current draft title from:
Draft Standard for Ethernet
Amendment:
Physical Layer Specifications and
Management Parameters for 25 Gb/s,
50 Gb/s, and 100 Gb/s Passive Optical
Networks

to:
Draft Standard for Ethernet
Amendment:
Physical Layer Specifications and
Management Parameters for 25 Gb/s and
50 Gb/s Passive Optical Networks

Response *Response Status* **C**

ACCEPT.

See comment #1

Cl **00** *SC* **0** *P* **89** *L* # 28

Hajduczenia, Marek Charter Communicatio

Comment Type **TR** *Comment Status* **D**

The value of FEC_CW_EQ_SZ does not seem to be correct. It is supposed to be the size of a FEC codeword in Eqs: 257 EQs is 18504 bits and not matching the size of the codeword in LDPC(16952,14392) FEC we use

SuggestedRemedy

The LDPC codeword size (16952) is not divisible by 72 to be expressed in EQs. Discussion is needed to figure out what this variable is expected to represent and whether it is needed at all

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change size of FEC_CW_EQ_SZ to <TBD> and mark in red.

AI for Mark and Glen to propose revision to the definition of this variable.

Cl **31A** *SC* **31A** *P* **23** *L* **15** # 4

Hajduczenia, Marek Charter Communicatio

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

Missing SYNC_PATTERN MPCPDU

SuggestedRemedy

Insert a new entry in Table 31A-1 with value 00-18 as follows:

00-18 | SYNC_PATTERN | 144.3.4.7 | Used by OLT to announce elements of the FEC-unprotected area (SP) to all ONUs on the given PON | Yes

Change the reserved row designation from "00-18 through 01-00" to "00-19 through 01-00"

Response *Response Status* **C**

ACCEPT.

Cl **31A** *SC* **31A** *P* **23** *L* **15** # 91

Kramer, Glen Broadcom

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

SYNC_PATTERN opcode is missing in Table 31A-1

SuggestedRemedy

Opcode: 00-18.
MAC Control function: SYNC_PATTERN.
Specified in: 144.3.4.7.
Value/Comment: Notify the recipient of patterns to be sent at the beginning of transmissions as indicated by the parameters of this function.
Timestamp: Yes.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #4

Cl **141** *SC* **141.2.7** *P* **38** *L* **34** # 93

Johnson, John Broadcom

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

The meanings of US0/1 and DS0/1 are not defined in Table 141-7.

SuggestedRemedy

Add footnotes to the Downstream Wavelength (a) and Upstream Wavelength headers (b):
a. Downstream wavelengths are defined in Table 141-11.
b. Upstream wavelengths are defined in Table 141-12.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.2.7.1** *P* **39** *L* **34** # 182

Remein, Duane Huawei

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

The footnote to tables 141-8 and 141-9 is incorrect "All OLT and ONU PMDs support the same coexistence mode, either X or G"

SuggestedRemedy

Change to read: "Paired OLT and ONU PMDs support the same coexistence mode, either X or G"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In Table 141–8 and Table 141–9, change

All OLT and ONU PMDs support the same coexistence mode, either X or G

to

On an ODN, OLT and ONU PMDs support the same coexistence mode, either X or G

Cl **141** *SC* **141.3.1.3** *P* **41** *L* **22** # 183

Remein, Duane Huawei

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

Redundant statement in the same sentence "..to the PMA defined in 142.4 … to the PMA defined in 142.4 …"

SuggestedRemedy

Strike the 2nd instance of "to the PMA defined in 142.4"

Response *Response Status* **C**

REJECT.

After the strike the statement does not make sense. There are two different rates at which the PMA may operate.

Cl **141** *SC* **141.3.1.4** *P* **41** *L* **29** # 184

Remein, Duane Huawei

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

142.3 describes the receive PCS which does not turn any laser on or off.

SuggestedRemedy

Strike "and 142.3"
While you're here fixe the xref {142.x.x.x} to 142.2.5.4.3 (in D1.3).

Response *Response Status* **C**

ACCEPT.

Comment type changed to T.

Cl **141** *SC* **141.3.2** *P* **41** *L* **52** # 185

Remein, Duane Huawei

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

Given that each TP#[i] represents 2 TPs I believe there are more than "eight reference points shown in Figure 141–2"

SuggestedRemedy

Strike "eight" (Engineers are typically able to count on their own)

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.3.4** *P* **43** *L* **6** # 186

Remein, Duane Huawei

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

Earlier PMD_UNITDATA[i].indication is defined as a primitive, we should be consistent. Same issue line 14.

SuggestedRemedy

Change "message" to "primitive"

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.3.5.1** *P* **43** *L* **16** # 187

Remein, Duane Huawei

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

This requirement is nearly duplicated in 141.3.5.1 and 141.3.5.2, We should avoid the duplication.
“The value of the SIGNAL_DETECT parameter shall be generated according to the conditions defined in Table 141–10 for Nx25G–EPON PMDs.”
"The value of the SIGNAL_DETECT parameter shall be generated according to the conditions defined in Table 141–10 for PMDs defined in this clause."

SuggestedRemedy

Strike the requirements in 141.3.5.1 & 141.3.5.2 and add the following sentence to 141.3.5.3: "The value of the SIGNAL_DETECT parameter shall be generated according to the conditions defined in Table 141–10 for Nx25G–EPON PMDs.”
The last sentence in 141.3.5.2 should then be combined with the 1st para.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Strike the requirements in 141.3.5.1 & 141.3.5.2 and add the following sentence to 141.3.5.3: "The value of the SIGNAL_DETECT parameter for Nx25G–EPON PMDs shall be generated according to the conditions defined in Table 141–10.”
The last sentence in 141.3.5.2 should then be combined with the 1st para.

Cl **141** *SC* **141.3.6** *P* **43** *L* **46** # 81

Kramer, Glen Broadcom

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

Resolution to comment #443 from Spokane: "AI for Glen to prepare a contribution to add "[i]" to SIGNAL_DETECT consistently in Clause 141."

SuggestedRemedy

SIGNAL_DETECT is already treated consistently in C141. SIGNAL_DETECT values associated with different channels are distinguished by indexing the associated PMD_SIGNAL interface, i.e., PMD_SIGNAL[i].indication(SIGNAL_DETECT). SIGNAL_DETECT here is simply a boolean that takes values of OK or FAIL).

In section 141.3.6, PMD_SIGNAL.request(tx_enable) should have "[i]" as well, e.g., PMD_SIGNAL[i].request(tx_enable) - 2 locations

Depending on how detailed we want to be with Test Points illustration (Fig. 141-2) we may want to show two arrows for SIGNAL_DETECT and two arrows for tx_enable for every ONU and the OLT. The labels then would be for signal detect arrows:
PMD_SIGNAL[0].indication(SIGNAL_DETECT)
PMD_SIGNAL[1].indication(SIGNAL_DETECT)
and for tx enable arrows:
PMD_SIGNAL[0].request(tx_enable)
PMD_SIGNAL[1].request(tx_enable)

But this would make the figure too busy. So, I would just leave it as is.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In section 141.3.6, PMD_SIGNAL.request(tx_enable) should have "[i]" as well, e.g., PMD_SIGNAL[i].request(tx_enable) - 2 locations

Cl **141** *SC* **141.5.1** *P* **44** *L* **39** # 5

Hajduczenia, Marek Charter Communicatio

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

Hardly any need for 141.5.1 and 141.5.2, given that there is no text in there right now.

SuggestedRemedy

Transmitter specification subclause in 10G-EPON (see 75.4.1) lists normative parameters from PMD tables and tie them with the measurement methods. Our draft has none of that right now. There is also description of the relationship between OMA, extinction ratio, and average power, which I believe we do not use (and do not need to specify).
Receiver specification subclause in 10G-EPON (see 75.4.2) lists normative parameters from PMD tables and tie them with the measurement methods.
Suggest to copy text from 141.6.2 to 141.5.2, with necessary updates.
Text for 141.6.1 and 141.5.1 should be copied from 10G-EPON (Clause 75, specifically 75.4.1) as applicable

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #188

Cl **141** *SC* **141.5.1** *P* **44** *L* **40** # 188

Remein, Duane Huawei

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

Section with no text

SuggestedRemedy

Add: "A medium power class Nx25G-EPON OLT PMD transmitter shall comply with the parameters shown in Table 141-13. A high power class Nx25G-EPON OLT PMD transmitter shall comply with the parameters shown in Table 141-14.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.5.1** *P* **45** *L* **1** # 94

Johnson, John Broadcom

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

The requirements for Optical return loss tolerance are determined by the fiber plant, which is the same as 10G-EPON. The same values for max ORL tolerance should be used for Nx25G-EPON.

SuggestedRemedy

Replace TBD values for Optical return loss tolerance (max) in Tables 141-13, 14, 17 and 18 with a value of 15dB.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.5.1** *P* **45** *L* **1** # 95

Johnson, John Broadcom

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

The same OLT transmitter technology used for 10G-EPON (EML) will be widely used for Nx25G-EPON. The same values for RIN15OMA, Average launch power of OFF transmitter and Transmitter reflectance should be used.

SuggestedRemedy

Replace TBD values for RIN15OMA (max) in Tables 141-13 and 141-14 with a value of -128 dB/Hz.
Replace TBD values for Average launch power of OFF transmitter, each channel (max) in Tables 141-13 and 141-14 with a value of -39 dBm.
Replace TBD values for Transmitter reflectance (max) in Tables 141-13 and 141-14 with a value of -10 dB.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.5.1** *P* **45** *L* **1** # 96

Johnson, John Broadcom

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

The same OLT transmitter technology used for 100GBASE-LR4 (EML) will be widely used for Nx25G-EPON. The same values for Transmitter eye mask definition should be used. Note that this same eye mask is also used for 10G-EPON.

SuggestedRemedy

Replace TBD values for Transmitter eye mask definition in Tables 141-13 and 141-14 with a value of {0.25, 0.4, 0.45, 0.25, 0.28, 0.4} UI. Add a footnote: "As defined in Figure 86.4."

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.5.1** *P* **46** *L* **1** # 97

Johnson, John Broadcom

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

The TF agreed at the May 2018 meeting to not specify Optical Modulation Amplitude (OMA), each channel (max). Maximum TX output power is defined by Average launch power, each channel (max). Refer to johnson_3ca_1a_0518, slide 17 for background.

SuggestedRemedy

Remove line for Optical Modulation Amplitude (OMA), each channel (max) in Table 141-14 and 141-18.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.5.1** *P* **46** *L* **30** # 6

Hajduczenia, Marek Charter Communicatio

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

Missing parameters in Table 141–14

SuggestedRemedy

Replace empty entries in Table 141–14 with {TBD}

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace empty entries in Table 141–14 with {TBD}, if there are any empty entries after this meeting.

Cl **141** *SC* **141.5.2** *P* **44** *L* **44** # 189

Remein, Duane Huawei

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

Section with no text

SuggestedRemedy

Add: "A medium power class Nx25G-EPON OLT PMD receiver shall comply with the parameters shown in Table 141-15. A high power class Nx25G-EPON OLT PMD receiver shall comply with the parameters shown in Table 141-16.
Table references should be live.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.5.2** *P* **47** *L* **1** # 98

Johnson, John Broadcom

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

The same type of receiver technology will be used for Nx25G-EPON as for 10G-EPON (APD in TO-can). The same value of receiver reflectance (max) should be used.

SuggestedRemedy

Replace TBD values for Receiver reflectance (max) in Tables 141-15 and 141-16 with a value of -12 dB.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.5.2** *P* **47** *L* **11** # 7

Hajduczenia, Marek Charter Communicatio

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

Given that 10G upstream PMD definition (OLT Rx) relies on a different FEC (with different gain) and different line code, can parameters defined in Clause 75 be reused directly, with no additional mapping / adaptation? Given that the raw BER (per-FEC) is lower than in 10G-EPON, it seems numbers need to be updated at least, using Clause 75 numbers for reference

SuggestedRemedy

Per comment

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add a footnote to the column using 10G-EPON parameters in Table 141–15 and Table 141–16 with the following text: "Individual 10G-EPON PMD parameters are reused without change at a higher pre-FEC bit error ratio shown in Table 141–[15/16]"

Cl **141** *SC* **141.5.2** *P* **48** *L* **1** # 99

Johnson, John Broadcom

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

The TF agreed at the May 2018 meeting to not specify Receive power, each channel (OMA) (max). Maximum RX output power is defined by Average receive power, each channel (max). Refer to johnson_3ca_1a_0518, slide 17 for background.

SuggestedRemedy

Remove line for Receive power, each channel (OMA), each channel (max) in Table 141-16 and 141-20.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.6.1** *P* **49** *L* **40** # 190

Remein, Duane Huawei

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

Section with no text

SuggestedRemedy

Add: "A medium power class Nx25G-EPON ONU PMD transmitter shall comply with the parameters shown in Table 141-17. A high power class Nx25G-EPON ONU PMD transmitter shall comply with the parameters shown in Table 141-18.
Table references should be live.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.6.1** *P* **50** *L* **1** # 101

Johnson, John Broadcom

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

The same ONU transmitter technology used for 25GBASE-LR/ER (25G DML) will be widely used for Nx25G-EPON. The same values for Transmitter eye mask definition should be used.

SuggestedRemedy

Replace TBD values for Transmitter eye mask definition in Tables 141-17 and 141-18 with a value of {0.31, 0.4, 0.45, 0.34, 0.38, 0.4} UI. Add a footnote: "As defined in Figure 86-4"

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.6.1** *P* **50** *L* **1** # 100

Johnson, John Broadcom

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

The same ONU transmitter technology used for 10G-EPON (DML) will be widely used for Nx25G-EPON. The same values for RIN15OMA, Average launch power of OFF transmitter and Transmitter reflectance should be used.

SuggestedRemedy

Replace TBD values for RIN15OMA (max) in Tables 141-17 and 141-18 with a value of -128 dB/Hz.
Replace TBD values for Average launch power of OFF transmitter, each channel (max) in Tables 141-17 and 141-18 with a value of -45 dBm.
Replace TBD values for Transmitter reflectance (max) in Tables 141-17 and 141-18 with a value of -10 dB.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.6.1** *P* **51** *L* **1** # 192

Remein, Duane Huawei

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

Footnotes for Table 141-17 appear on next page without a table continuation header.

SuggestedRemedy

Interesting problem, the table could be extended so some of it crosses the page and creates a continuation header or shortened so the footnotes appear on the same page as the table.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor to contact staff editor to investigate options.

Cl **141** *SC* **141.6.2** *P* **53** *L* **2** # 194

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

A literal reading of this requirement leads one to believe that all ONU PMDs must comply with both table 141-19 and 20: "The signaling speed, operating wavelength, overload, stressed sensitivity, reflectance, and signal detect for receivers forming part of the ONU PMDs shall meet the specifications defined in T able 141–19 and T able 141–20 for C lause 141 ONU PMDs, per measurement techniques defined in 141.7."

SuggestedRemedy

Change to: "The signaling speed, operating wavelength, overload, stressed sensitivity, reflectance, and signal detect for receivers forming part of the ONU PMDs shall meet the specifications defined in Table 141–19 or Table 141–20 for Nx25G-EPON ONU PMDs, per measurement techniques defined in 141.7.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

AI for Duane to align the text

Cl **141** *SC* **141.6.2** *P* **53** *L* **7** # 8

Hajduczenia, Marek Charter Communicatio

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

Damage threshold is not defined in Table 141-11

SuggestedRemedy

Change reference from Table 141-11 to "Table 141–19 or Table 141–20" (2 locations on page 53)

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.6.2** *P* **53** *L* **20** # 9

Hajduczenia, Marek Charter Communicatio

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

No 50GBASE-PQG-U2 in Table 141-19?

SuggestedRemedy

It is defined in Table 141–17, and should be included in Table 141-19 as well

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add 50GBASE-PQG-U2 to Table 141-19

Cl **141** *SC* **141.7** *P* **55** *L* **3** # 105

Johnson, John Broadcom

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

TBD Corner frequencies should be based on 10G-EPON for 10G receivers (see 75.7) and on 100GBASE-LR4 (see 88.8.5.3) for 25G and 50G receivers.

SuggestedRemedy

Change first sentence to read:
"When measuring jitter at TP1[i] and TP5[i], it is recommended that jitter contributions at frequencies below receiver corner frequencies (i.e., 10 MHz for 25.78125 GBd receiver and 4 MHz for 10.3125 GBd receiver) are filtered at the measurement unit."

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.7** *P* **55** *L* **3** # 195

Remein, Duane Huawei

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

This sentence seems out of place "When measuring jitter at TP1[i] and TP5[i], it is recommended that jitter contributions at frequencies below receiver corner frequencies (i.e., {TBD}) are filtered at the measurement unit."

SuggestedRemedy

Move to 141.7.12 where it is more appropriate

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #105 for updated text + move to 141.7.12.

Cl **141** *SC* **141.7.4** *P* **55** *L* **34** # 196

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Is the phrase "any valid encoded 256B/257B data stream" meant to imply a scrambled data stream also? If so we should be explicit.

SuggestedRemedy

Change to "any valid 256B/257B encoded and scrambled data stream (see 142.2)."

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Looking at .3av, no reference to scrambling was being made.

Cl **141** *SC* **141.7.6** *P* **55** *L* **43** # 103

Johnson, John Broadcom

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

OMA test procedure is required.

SuggestedRemedy

Use the OMA test procedure as defined in 88.8.4.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace TBD with "See 88.8.4" and use proper formatting.

Cl **141** *SC* **141.7.7** *P* **55** *L* **47** # 104

Johnson, John Broadcom

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

RIN_OMA test procedure is required.

SuggestedRemedy

Use the RIN20OMA test procedure as definied in 88.8.7 with the exception that the optical return loss is 15 dB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace TBD with "See 88.8.7, with exception of the optical return loss value of 15 dB." and use proper formatting.

Cl **141** *SC* **141.7.8** *P* **56** *L* **3** # 106

Johnson, John Broadcom

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

TBD transmitter eye mask references should be based on 100GBASE-LR4 for 25GBd OLT TX and on 25GBASE-LR for 25Bd ONU TX.

SuggestedRemedy

Change the sentence to read:
"The required transmitter pulse shape characteristics are specified in the form of a mask of the transmitter eye diagram as shown in Figure 86-4 for PQ type PMDs, and the test method shall be according to 88.8.8."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the sentence to read:
"The required transmitter pulse shape characteristics for PQ type PMDs are specified in the form of a mask of the transmitter eye diagram as shown in Figure 86-4 and the test method shall be according to 88.8.8."

Cl **141** *SC* **141.7.13.1** *P* **57** *L* **25** # 197

Remein, Duane Huawei

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

In Figure 141-3 we can be more accurate regarding the Upstream data during Ton to Tcdr.

SuggestedRemedy

Change "Idles" to "Synchronization Pattern". Move the Toff dimension line down slightly to align with Ton and Tcdr dimensions not the signal base-line.

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.7.13.2** *P* **58** *L* **5** # 198

Remein, Duane Huawei

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

Figure 141-4 appears to redefined TP4[i] and, given Tx_Enable (global) turns on all channels at the same time so measurement of individual channels is impossible as shown.

SuggestedRemedy

Change "Tx_Enable" to "Tx_Enable[i]"
Remove TP4[i], MDI to the right (it is not part of the system, TP3 is sufficient), and right arrow from "System Bulkhead" (dropping the "s").

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.7.14.1** *P* **59** *L* **15** # 201

Remein, Duane Huawei

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

"Tx_Enable" should be "Tx_Enable[i]"

SuggestedRemedy

per comment

Response *Response Status* **C**

ACCEPT.

Cl **141** *SC* **141.9** *P* **61** *L* **28** # 159

Ferretti, Vince Corning

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

Re-write of of section 141.9, 141.9.1, 141.9.2 and 141.9.3 to define normative and informative fiber and cable charactertistics

SuggestedRemedy

Normative reference for dispersion removed from 141.9 paragraph.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See Ferretti_3ca_1a_1112.pdf, use "dated" reference to G.652-2016.

Cl **141** *SC* **141.91** *P* **61** *L* **42** # 160

Ferretti, Vince Corning

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

Re-write of of section 141.9, 141.9.1, 141.9.2 and 141.9.3 to define normative and informative fiber and cable charactertistics

SuggestedRemedy

Updated table reference from Table 141.21 to Table 141.1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #159

Cl **141** *SC* **141.92** *P* **61** *L* **47** # 161

Ferretti, Vince Corning

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

Re-write of of section 141.9, 141.9.1, 141.9.2 and 141.9.3 to define normative and informative fiber and cable charactertistics

SuggestedRemedy

Added normative and informative information fiber and cable dispersion uincluding informative table with nominal wavelengths of UW and DW channels

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #159

Cl **141** *SC* **141.93** *P* **62** *L* **1** # 162

Ferretti, Vince Corning

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

Re-write of of section 141.9, 141.9.1, 141.9.2 and 141.9.3 to define normative and informative fiber and cable charactertistics

SuggestedRemedy

Removed Table 141.20 as it should have been in section 141.92. Removed references to splitter and fiber specifications as they are not needed

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #159

Cl **142** *SC* **142.1.3** *P* **66** *L* **52** # 107

Laubach, Mark Broadcom

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

"Figure 142-1" is not introduced in any preceding text.

SuggestedRemedy

Editor's choice to add a sentence in the appropriate preceding clause on Page 65 prior to the mention of Figure 142-2 on line 16 that introduces the Figure 142-1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add "(see Figure 142–1)" page 65, line 12 (at the end).

Cl **142** *SC* **142.1.3.1** *P* **68** *L* **50** # 85

Kramer, Glen Broadcom

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

"a concatenation of x bits of SP1 (x is between 1 and 257) and (257-x) bits of SP2"
This text is poorly formed, as the first parenthetical expression meant to be an explanation of x and the second parenthetical expression meant to represent a number.

SuggestedRemedy

Replace the text with this: " "concatenation of x bits of SP1 and y bits of SP2, where x is between 1 and 257, and x + y = 257" (Show x and y in italics)

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2** *P* **69** *L* **34** # 45

Hajduczenia, Marek Charter Communicatio

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

Figure 142-5 is missing

SuggestedRemedy

Mark it as TBD at this time.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #77

Cl **142** *SC* **142.2** *P* **70** *L* **1** # 77

Kramer, Glen Broadcom

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

Transmit bit order (Figure 142-5) is missing

SuggestedRemedy

Insert figure 142-5 as shown in kramer_3ca_4_1118.pdf

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2** *P* **70** *L* **2** # 108

Laubach, Mark Broadcom

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

There is space for the drawing for Figure 142-5 "Transmit bit ordering", but nothing is shown, it is blank and no editor's note.

SuggestedRemedy

Provide the figure if available or an Editor's note mentioning the intentional absence.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #77

Cl **142** *SC* **142.2.1** *P* **69** *L* **44** # 47

Hajduczenia, Marek Charter Communicatio

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

This subclause has the total of 3 sentences

SuggestedRemedy

Change first two sentences to read as follows

The Nx25G PCS encodes a 72-bit tx_raw vector into a 64B/66B block structure as defined in 49.2.4, using all the block type fields in Figure 49-7 except block type field values of: 0x2D, 0x33, 0x66, 0x55, and 0x4B.

There are no other exceptions listed in this subclause

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Per comment + change "The PCS bit transmission order illustrated in Figure 142–5." to "The PCS bit transmission order is illustrated in Figure 142–5."

Cl **142** *SC* **142.2.1.1** *P* **70** *L* **1** # 170

Wey, Jun Shan ZTE TX

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

Figure 142-5 is missing

SuggestedRemedy

Restore the figure

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #77

Cl **142** *SC* **142.2.2** *P* **70** *L* **38** # 82

Kramer, Glen Broadcom

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

Scrambler defined in C49 only scrambles 64-bit blocks of data, not the 66 bits. (The sync headers are not scrambled). Also, we don't say anything about the scrambler synchronization for each upstream burst.

SuggestedRemedy

1) Replace "Each 66-bit block is scrambled using the scrambling function defined in 49.2.6." with
"The payload of each 66-bit block is scrambled using the scrambling function defined in 49.2.6."
2) Add new paragraph following the above sentence:
"In the ONU, at the beginning of each burst, the scrambler is initialized with the unscrambled value of IBI_EQ (see 143.3.3.3)."
3) Add a new paragraph at the end of section 142.3.3 Descrambler:
"In the OLT, at the beginning of each burst, the descrambler is initialized with the unscrambled value of IBI_EQ (see 143.3.3.3)."

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.4** *P* **70** *L* **52** # 132

Powell, Bill Nokia

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

sentence: … using LDPC(16952,14392) FEC, defined

SuggestedRemedy

there is no reason to introduce specific LDPC-related notation here; propose to rewrite: … using the FEC Encoder specified in 142.2.4.1.

Response *Response Status* **C**

REJECT.

This is the only location where LDPC codeword size is defined in a simple manner

Cl **142** *SC* **142.2.4** *P* **70** *L* **52** # 135

Powell, Bill Nokia

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

We think that there are a lot of issues with the descriptions in this section, and that it could be significantly improved by first describing the full FEC matrix, and then describing puncturing, shortening, and interleaving in the right sequence.

SuggestedRemedy

My colleagues and I volunteer to re-write section 142.2.4 (in conjunction with other interested parties) if we could get the source text file for this section as it currently exists (or will exist in D1.4) in MS Word docx, RTF, or Framemaker format.

We will discuss our proposed plan and notation offline with interested parties before our re-write.

If this is renerally accepted by the group (and the editor to provide the text in one of these formats), we can skip all of our other following comments that pertain to Sections 142.2.4.x relative to D1.3.

Response *Response Status* **C**

REJECT.

No changes required at this time.

Cl **142** *SC* **142.2.4** *P* **70** *L* **52** # 49

Hajduczenia, Marek Charter Communicatio

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

We are still missing an Annex to provide an example of LDPC(16952,14392) FEC encoding.

SuggestedRemedy

Add a new Annex 142A with the title "Encoding example for LDPC(16952,14392) FEC"
Change "gives an example of {TBD} FEC Encoding" to "gives an example of LDPC(16952,14392) FEC encoding"
Is content included in 142.2.4.5 Example of initial control seed sequence intended to be used as an encoding example?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add a new Annex 142A with the title "Encoding example for LDPC(16952,14392) FEC and interleaving"
Change "gives an example of {TBD} FEC Encoding" to "gives an example of LDPC(16952,14392) FEC encoding and interleaving"

Move content from 142.2.4.5 into new Annex.

Cl **142** *SC* **142.2.4** *P* **70** *L* **53** # 134

Powell, Bill Nokia

Comment Type **TR** *Comment Status* **D**

Note - These comments apply to various instances throughout section 142.2.4.x

The term interleaving is generally used to describe the process of transforming a sequence that is in regular order into a sequence that is interleaved or transformed.

The current use of "interleaver" and "de-interleaver" should be reversed in theses sections.

The terms "omega network" and "reverse omega network" are also used in these sections where:
- omega network corresponds to de-interleaver
and
- reverse omega network corresponds to "interleaver"

We think that it would be clearer to use interleaver and de-interleaver throughout the text in this section instead of the omega network and reverse omega network terms.

SuggestedRemedy

Proposed changes:
Change all instances in 142.2.4.x sections as follows:
- Change "interleaver" to "de-interleaver"
- Change "de-interleaver" to "interleaver"

- Change "omega network" to "de-interleaver"
- Change "reverse omega network" to "interleaver"

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.4** *P* **70** *L* **53** # 133

Powell, Bill Nokia

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

reference to non-existing section: 142.2.2.5.1

SuggestedRemedy

Add section or remove reference

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace with link to 142.2.4 and make the link live.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **2** # 136

Powell, Bill Nokia

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

sentence: … produced by FEC Encoder …

SuggestedRemedy

rewrite: … generated by the FEC Encoder …

Response *Response Status* **C**

REJECT.

Not clear what the proposed change achieves.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **3** # 138

Powell, Bill Nokia

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

The current text is convoluted; it would make most sense to write that a quasi-cyclic LDPC code was selected, specified by an mxn shift-matrix and a lifting factor Z = 256. This specifies the maximum word length: N* = nZ and the number of parity-check bits M* = mZ. It is typically also useful to specify k = n-m, and K* = N-M, the maximum number of systematic bits. After the definition of the code and its parameters, one can state that one uses K information bits, where K <= K_max <= K*, and that the remaining K*-K bits are assumed to be zero, and not transmitted - this way, one also does not need a "zero-padding" module in the encoder. The first M = M* - 512 parity-check bits are transmitted; this implies that the remaining parity-check bits do not have to be computed (one does not need a puncturing module in the encoder). Using this outline, one does not need the parameters P and S.

SuggestedRemedy

Proposal: specify the full-length LDPC code in 142.2.4.1. Avoid any discussion about puncturing and shortening here. Move this to 142.2.4.3. The description on p. 75, lines 5-18 is generally better than on p. 71, lines 3-25.

Response *Response Status* **C**

REJECT.

A set of specific proposed changes would be welcome. General outlines are not helpful. The Editor will not be undertaking a rewrite based on rather generic guidelines.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **3** # 137

Powell, Bill Nokia

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

sentence: … to channel encoding is …

SuggestedRemedy

rewrite: to the FEC Encoder is …

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **5** # 139

Powell, Bill Nokia

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

sentence: … where M is the number of parity-check bits.

SuggestedRemedy

rewrite: … where M is the number of "transmitted" parity-check bits.

Response *Response Status* **C**

REJECT.

Unclear of what the purpose of "transmitted" is and what the change achieves.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **14** # 143

Powell, Bill Nokia

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

a maximum number of information bits is specified, but can this be any number, or is it a multiple of 8, 16, …? Should one also specify a minimum number of information bits?

SuggestedRemedy

discussion and resolution with respect to the minimum length and the granularity

Response *Response Status* **C**

REJECT.

Discussion needed at the meeting. No changes at this time.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **18** # 144

Powell, Bill Nokia

Comment Type **ER** *Comment Status* **D**

sentence: … the number of parity-check bits after puncturing, M (M = 3072 - 512 = 2560);

SuggestedRemedy

please note that M has already been defined on p. 71, line 5; it may not be necessary to redefine it here; rewrite: … the number of transmitted parity-check bits, M (M = 2560).

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **20** # 145

Powell, Bill Nokia

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

sentence: … shortening length

SuggestedRemedy

Will provide suggested change before meeting

Response *Response Status* **C**

REJECT.

No change at this time.

Cl **142** *SC* **142.2.4.1** *P* **71** *L* **24** # 146

Powell, Bill Nokia

Comment Type **TR** *Comment Status* **D**

sentence: The encoder supports highest code rate Rmax = Kmax/Nmax = 0.849.

SuggestedRemedy

please note the difference in the maximum rate; propose to rewrite: The FEC Encoder supports an FEC code rate up to Rmax = Kmax/Nmax = 14392/16952 = 0.8466.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.4.1** *P* **74** *L* **48** # 148

Powell, Bill Nokia

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

Fig. 142-7 - the labeling in this figure is ambiguous. If the systematic part of this "codeword" represents the input to the encoder, then the label "transmitted user bits" is inaccurate, as the encoder operates on an "bit-interleaved" sequence. The label "Transmitted Parity Bits" is also ambiguous, as the Parity Bits are interleaved prior to transmission. At the same time, this is also not a depiction of the transmitted sequence.

SuggestedRemedy

It is proposed to modify at least the labels, and possibly to introduce a second/third figure, or a combined figure. One could then show: block of K information bits; implicit zero-extension; 256-bit blockwise interleaving; encoding, i.e., determination of the first 10 256-bit parity-check segments; (de)interleaving of the parity segments; transmission of the K user bits, followed by 2560 interleaved parity-check bits.

Response *Response Status* **C**

REJECT.

A specific solution / set of changes would be welcome, please.

Cl **142** *SC* **142.2.4.2** *P* **72** *L* **21** # 147

Powell, Bill Nokia

Comment Type **TR** *Comment Status* **D**

right column shifts

SuggestedRemedy

propose to introduce a shift-by-one Z×Z matrix B, or using a cyclic permutation. The matrix probably works best. The HC matrix would then specify the exponent of B (repeated shifts).

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.4.3** *P* **75** *L* **15** # 149

Powell, Bill Nokia

Comment Type **TR** *Comment Status* **D**

Sentence: M+P parity bits … are sent to the puncturing block. In the encoder, it does not seem to be necessary to compute the P 256-bit parity-check bit sequence and then to puncture these. There is no option for a different puncturing rate, and therefore there does not seem to be a need to include a puncturing block.

SuggestedRemedy

Remove puncturing block

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.4.4** *P* **75** *L* **37** # 150

Powell, Bill Nokia

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

The proposed de-interleaver/interleaver is a module that has 256 data inputs, 256 data outputs, a 128-bit seed, and a "fixed/pre-defined" cyclic rotation of this seed (shift factor: 17). Fig. 142-8 seems to imply that a massively parallel structure is needed with 57 * 256 inputs.

SuggestedRemedy

It seems more straightforward to present one de-interleaver unit and then associate the seeds with the segment indices.

Response *Response Status* **C**

REJECT.

A specific solution / set of changes would be welcome, please.

Cl **142** *SC* **142.2.4.4** *P* **75** *L* **45** # 152

Powell, Bill Nokia

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

Sentence: … consists of 12 local interleavers … not sure what local refers to; it seems to make more sense to state that the first 10 256-bit parity-check bit segments are de-interleaved using an 8-stage 256x256 reversed omega network, where each segment has its own seed.

SuggestedRemedy

Proposed: The first 10 256-bit parity-check bit segments are de-interleaved using an 8-stage 256x256 reversed omega network, where each segment has its own seed.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Use the following text

The first ten 256-bit parity-check bit segments are de-interleaved using an eight-stage 256x256 reversed omega network, where each segment has its own seed.

Cl **142** *SC* **142.2.4.4** *P* **75** *L* **45** # 151

Powell, Bill Nokia

Comment Type **TR** *Comment Status* **D**

Sentence: The parity bit interleaver … given that Fig. 142-8 show the information bit de-interleaver, it seems to make sense to first discuss the parity-check bit interleaver

SuggestedRemedy

Sentence: The parity-check bit de-interleaver …

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.4.4** *P* **75** *L* **50** # 153

Powell, Bill Nokia

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

Paragraph - at this point, the omega network has not yet been properly described. It is stated that the omega network architecture is such that data is input from the left side and output from the right - the supporting figure shows that data is input at the top and that it is output at the bottom; all in all this is a very vague specification. Also, the statement that the data can be fed to the right side to obtain the inverse at the left side is true in the sense of a permutation, but it is generally not true when one is using hardware; it is hard to operate AND and OR gates in the reverse direction.

SuggestedRemedy

Another reason for our proposed re-write of section 142.2.4

Response *Response Status* **C**

REJECT.

A specific solution / set of changes would be welcome, please.

Cl **142** *SC* **142.2.4.4** *P* **76** *L* **10** # 154

Powell, Bill Nokia

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

Fig. 142-9 - there is no need to draw two interleavers that are then removed. Also, for a consistent terminology, the parity-check bit segments are being "deinterleaved" prior to transmission. The figure caption is also misleading, as this is the Parity-Check Bit Deinterleaver.

SuggestedRemedy

Remove two crossed out interleavers

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.4.4** *P* **76** *L* **30** # 155

Powell, Bill Nokia

Comment Type **T** *Comment Status* **R**

Fig. 142-10 is colorful, but it does not contain relevant information. First, the interconnections in the eight interconnection blocks are identical (one may as well draw this as a parallel-switch followed be an interconnection block, that is repeated eight times. It is also important to note that the parallel-switch is controlled by a "seed" sequence, and cyclic shifts (by 17) thereof.

SuggestedRemedy

No specific fix proposed at this time

Response *Response Status* **C**

REJECT.

A specific solution / set of changes would be welcome, please.

Cl **142** *SC* **142.2.4.4** *P* **76** *L* **46** # 156

Powell, Bill Nokia

Comment Type **T** *Comment Status* **R**

A two-port switch has two data inputs, two data outputs, and a control signal. It is important to depict the switch as such, and introduce notation to specify a 128-bit switch control sequence.

SuggestedRemedy

No specific figure change proposed at this time

Response *Response Status* **C**

REJECT.

A specific solution / set of changes would be welcome, please.

Cl **142** *SC* **142.2.4.4** *P* **76** *L* **52** # 53

Hajduczenia, Marek Charter Communicatio

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

It is absolutely not clear Figure 142–11 is supposed to represent. Text speaks that "If the switch is programmed to be 1, then this switch performs a
swap of the input bits, otherwise, the input will be pass-through as shown in Figure 142–11". But it is not clear which one is the 0 and which one is the 1 setting.

SuggestedRemedy

Either additional text is needed, or skip the reference to the said switch altogether.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Remove Figure 142-11 and statement "as shown in Figure 142–11"

Cl **142** *SC* **142.2.4.5** *P* **77** *L* **2** # 157

Powell, Bill Nokia

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

Sentence: … and i - 0, …, 127 - the regular numbering thus far starts at 1. In the context of the permutation, an index starting at 0 can be useful, but it is not difficult to let this index also start at 1.

SuggestedRemedy

Rewrite: … and i = 0, …, 127.

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.4.5** *P* **77** *L* **6** # 158

Powell, Bill Nokia

Comment Type **T** *Comment Status* **R**

The description of the permutation is overly complex and should be simplified. Given that the permutation is the same for all eight stages, it is not necessary to specify it as a function of the stage parameter k. Note also the reuse of the parameters S (number of zeroed bits), and k, related to the number of information bits.

SuggestedRemedy

No specific fix proposed at this time

Response *Response Status* **C**

REJECT.

A specific solution / set of changes would be welcome, please.

Cl **142** *SC* **142.2.5** *P* **81** *L* **10** # 55

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **D**

Information "The value of bit 257 being one implies that the 257-bit block has been transcoded and scrambled." could be included where the bit origin is being explained, to be more coherent

SuggestedRemedy

Change "(bit 257 is one)" to "(bit 257 is one, indicating that this 257-bit block has been transcoded and scrambled)"

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.5.1** *P* **81** *L* **48** # 204

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D** *revisit*

What is a "FEC Delimiter"? This term is undefined.

SuggestedRemedy

Change to "FEC_CW_DELIM"

Proposed Response *Response Status* **O**

FEC Parity is an object, FEC delimiter is an object . FEC_CW_DELIM is a constant value of 0x3CA that represents the value of FEC delimiter. You cannot insert a constant into a bit stream. It makes no sense at all.

Change "FEC Delimiter" to "burst delimiter bit pattern"

Cl **142** *SC* **142.2.5.2** *P* **82** *L* **10** # 58

Hajduczenia, Marek Charter Communicatio

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

"SP1_RepeatCount" and similar do not exist anymore

SuggestedRemedy

Likely, Count (per Table 144-8) is meant here?
Change "of SP1_RepeatCount, SP2_RepeatCount and SP3_RepeatCount" to "Count value for SP1, SP2, and SP3" - use proper formatting

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

SPn_RepeatCounts should all be replaced with SP#Length. Comment #409 from San Diego was not implemented completely (- Repeat Count SP 1/2/3 to SP1Length, SP2Length, SP3Length + propagate through)

Cl **142** *SC* **142.2.5.2** *P* **82** *L* **28** # 205

Remein, Duane Huawei

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

Oops! Cmt #459 was misguided. Apologies to the Editor.

SuggestedRemedy

Change :
"This FIFO holds either SP_LENGTH or FEC_PARITY_SIZE elements, whichever is greater." to:
"This FIFO holds SP_LENGTH elements."

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.5.2** *P* **82** *L* **52** # 18

Hajduczenia, Marek Charter Communicatio

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

"257-bit payload vector" - block versus vector - in some locations, we speak of multi-bit fields as blocks, in other - as vectors. Is there any distinction intended here, i.e., different internal organization of the field, structure, etc. that would differentiate these?

SuggestedRemedy

Reading through various locations in the draft, it seems block and vector are used interchanagbly and we could collapse terminology to "block" only, which is more common today in the draft

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Use the term "block" (112 instances) in all instances of "vector" (75 instances) for consistency

Cl **142** *SC* **142.2.5.2** *P* **83** *L* **8** # 86

Kramer, Glen Broadcom

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

Definition of SP_LENGTH has some issues:
We only use all caps for constants and buffer names. SP_LENGTH is a variable, so probably should be called SpLength. Also, we do not use field names SP1_RepeatCount, SP2_RepeatCount and SP3_RepeatCount anymore.

SuggestedRemedy

Use the following definition:

SpLength
TYPE: integer
The SpLength variable represents the length of the synchronization pattern as determined by the most recent settings of SP1Length, SP2Length, and SP3Length provisioned in an ONU (see 144.3.4.4 and 144.3.4.6).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Use the following definition:

SpLength
TYPE: unsigned integer
The SpLength variable represents the length of the synchronization pattern as determined by the sum of the most recent settings of SP1Length, SP2Length, and SP3Length provisioned in an ONU (see 144.3.4.4 and 144.3.4.6).

No need to use signed integer, since it is never expected to be a negative value. Update SDs to match new SpLength spelling.

Cl **142** *SC* **142.2.5.2** *P* **83** *L* **14** # 83

Kramer, Glen Broadcom

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

SpIndex used in different places to represent two very different concepts. In C143, it represents the intex of a sync pattern and can take values of 1, 2, or [3]. In C142, it represents index of an individual sync pattern 257b block and can range from 0 to a few hundred. While not a technical error, it just makes a confusing spec.

SuggestedRemedy

in C143, replace all instances of "SpIndex" with "SpSeq" for SP sequence. Keep SpIndex in C142.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In C144, replace all instances of "SpIndex" with "SpSeq"

Cl **142** *SC* **142.2.5.2** *P* **83** *L* **41** # 60

Hajduczenia, Marek Charter Communicatio

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

Given that we have also option for running 10Gb/s in upstream, MII can be of 25GMII or XGMII type

SuggestedRemedy

Change "Input Process from the 25GMII" to "Input Process from the 25GMII or XGMII"
Similar change is needed in NextTxVector where 25GMII is listed explicitly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "Input Process from the 25GMII" to "Input Process from the xMII"
Similar change is needed in NextTxVector where 25GMII is listed explicitly.

Cl **142** *SC* **142.2.5.3** *P* **84** *L* **10** # 15

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **D**

FIFO implementations are typically described using push and pop operations, i.e., push adds an element at the end of the FIFO, while pop removes the head element. Not clear why we had to come up with "Append" and "GetHead" methods instead of using push and pop methods?

SuggestedRemedy

Change .Append to .Push
Change .GetHead to .Pop

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.5.3** *P* **84** *L* **43** # 16

Hajduczenia, Marek Charter Communicatio

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

Transcode function definition is not technically correct - it does not perform "64B/66B to 256B/257B transcoding", but rather performs transcording between four 64B/66B-encoded blocks into one 256B/257B-encoded block

SuggestedRemedy

Change
This function performs 64B/66B to 256B/257B transcoding
To
This function transcodes four 64B/66B-encoded blocks into a single 256B/257B-encoded block

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.5.3** *P* **84** *L* **44** # 17

Hajduczenia, Marek Charter Communicatio

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

Irrelevant information: takes an array of four scrambled 66-bit blocks - the function does not verify whether blocks are scrambled or not.

SuggestedRemedy

Change
takes an array of four scrambled 66-bit blocks
to
takes four 64B/66B-encoded blocks

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.5.4.1** *P* **84** *L* **52** # 13

Hajduczenia, Marek Charter Communicatio

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

"into a single 72-bit tx_raw vector" - tx_raw vector is not mentioned really anywhere, so it does not need to be mentioned - two 36-bit transfers are spliced together, it is all that happens here

SuggestedRemedy

Change "into a single 72-bit tx_raw vector" to "into a single 72-bit vector"
Consider whether reference to tx_raw vector reference in 142.2.1 is really needed - seems spurious as well.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the first instance of "tx_raw vector" to "tx_raw vector (see 49.2.13.2.2)" and use proper formatting.

Cl **142** *SC* **142.2.5.4.1** *P* **84** *L* **54** # 67

Hajduczenia, Marek Charter Communicatio

Comment Type **TR** *Comment Status* **D**

What is a "64B/66B" block? Similarly, what is a "256B/257B block"? 64B/66B describes encoding operation or a line code, not a block. A block is either 64-bit or 66-bit long, not 64B/66B bit long. It is a misnomer

SuggestedRemedy

Change all instances of "256B/257B block" to "256B/257B-encoded block" (3 instances, it speaks to the size and structure at the same time)
Change all instances of "64B/66B block" to "64B/66B-encoded block" (4 instances)
Change all instances of "256B/257B vector" to "256B/257B-encoded block" (1 instance)

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **142** *SC* **142.2.5.4.1** *P* **84** *L* **54** # 14

Hajduczenia, Marek Charter Communicatio

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

"at the end of a transmission" - unclear what transmission is being referred to in here? Upstream burst?

SuggestedRemedy

Please clarify whether an upstream transmission slot is meant here, or something altogether else

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change

at the end of a transmission

to

at the end of an upstream burst

Cl **142** *SC* **142.2.5.4.1** *P* **86** *L* **11** # 64

Hajduczenia, Marek Charter Communicatio

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

Likely wrong name of the block: WAIT_FOR_66B - at this level, we are collecting vectors (72-bit) from xGMII and only encode them after that, in ACCUMULATOR state, using ENCODE() function.
Note also definitions of variables in NEXT_VECTOR state (TxNext, TxPrev) which clearly state these are 72-bit vectors.

SuggestedRemedy

Change WAIT_FOR_66B to WAIT_FOR_72B state name, since is reflects more correctly what happens here

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change WAIT_FOR_66B to WAIT_FOR_VECTOR state name

Cl **142** *SC* **142.2.5.4.1** *P* **86** *L* **32** # 66

Hajduczenia, Marek Charter Communicatio

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

In state PROCESS_DATA, it is clear that aggregated data is transcoded and placed into TxInput<256:0>, with 257 bit indicating whether data is scrambled or not. However, XBUFFER[3:0] is then scrambled and written onto itself (XBUFFER[3:0] <= Scramble(XBUFFER[3:0])) and then nothing else happens with the XBUFFER content. All further operations are performed on TxInput vector. Is the transcoded vector expected to be scrambled before it is FEC encoded? That is what the description in 142.2.5.4.1 would imply: "Four 64B/66B blocks are accumulated, scrambled, and transcoded into a single 256B/257B block and copied to the FEC Encoder."
The order of operations, though (first scrambling, then transcoding) is questionable, though - transcoding maps between well known sequences, while scrambling adds a level of bit stream randomization after which transcoding does not make much sense IMO. I believe sequence should be first transcoded from 4 x 72 bit vectors into a single 256 bit sequence and then scrambled, and only then FEC encoded.

SuggestedRemedy

in Figure 142–13, in state PROCESS_DATA, change the following operations

TxInput<256:0> <= Transcode(XBUFFER[3:0])
XBUFFER[3:0] <= Scramble(XBUFFER[3:0])

to read

XBUFFER[3:0] <= Transcode(XBUFFER[3:0])
TxInput<256:0> <= Scramble(XBUFFER[3:0])

to match the logical order of assignment into the TxInput vector, i.e., first we transcode and overwrite the XBUFFER with the resulting value, and then use this value to perform scrambling and write the resulting (scrambled) value into TxInput vector for further processing in the following states.

Change

"Four 64B/66B blocks are accumulated, scrambled, and transcoded into a single 256B/257B block and copied to the FEC Encoder."

to

"Four 64B/66B blocks are accumulated, transcoded, and scrambled into a single 256B/257B block and copied to the FEC Encoder."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Comment #544 from Spokane was not implemented properly. In Fig 142-13, in State PROCESS_DATA, change

TxInput<256:0> <= Transcode(XBUFFER[3:0])
XBUFFER[3:0] <= Scramble(XBUFFER[3:0])

to

XBUFFER[3:0] <= Scramble(XBUFFER[3:0])
TxInput<256:0> <= Transcode(XBUFFER[3:0])

Cl **142** *SC* **142.2.5.4.2** *P* **85** *L* **16** # 19

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **D** *revisit*

There is no such thing as "FEC parity codeword"

SuggestedRemedy

Change to "FEC parity" or "FEC codeword parity" - there are two instances in the draft where this term exists

Proposed Response *Response Status* **O**

In 142.2.5.4.2, change "FEC parity codeword" to "PARITY_STAGING_BUFFER"

In 142.2.5.4.3, remove "indicating a FEC
parity codeword needs to be inserted in the data stream,", and change "257-bits of the parity" to 257-bits"

Cl **142** *SC* **142.2.5.4.3** *P* **85** *L* **25** # 20

Hajduczenia, Marek Charter Communicatio

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

Unnecessary detail in the summary "from the TX_FIFO or FEC Encoder"

SuggestedRemedy

Strike

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.2.5.4.3** *P* **85** *L* **25** # 21

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **R**

Unnecessary detail: "On each transition of the CLK_OUT to True"

SuggestedRemedy

Simplify to "On each CLK_OUT, "

Response *Response Status* **C**

REJECT.

CLK_OUT is defined as clear-on-read Boolean variable, so we need to be clear on what the trigger is. Even if in the introduction text, we want to treat CLK_OUT as a clock, we still need to clarify whether transition happens on rising edge, falling edge, or both edges (like 25GMII clock.)

Cl **142** *SC* **142.2.5.4.3** *P* **85** *L* **27** # 24

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **D** *revisit*

This text reads way too much like blow by blow readout of the state diagram, which defeats the whole purpose of the SD to begin with: people know how to read conditions and the text needs only to outline the operation, and not read out the SD as it operates:

If the retrieved 258-bit block is equal to SP[0] and Transmitting is False, indicating the beginning of a transmission,
the argument of the PMA_SIGNAL.request is set to True indicating that the laser needs to be
turned on, and the lower 257-bits of the 258-bit block are sent to the PMA. If the retrieved 258-bit block is
EBD and Transmitting is True, indicating the end of a transmission, the argument of the PMA_SIGNAL.
request is set to False indicating that the laser needs to be turned off, and the lower 257-bits of the
258-bit block are sent to the PMA. If the retrieved 258-bit block is PAR_PLACEHLDR, indicating a FEC
parity codeword needs to be inserted in the data stream, 257-bits of the parity are retrieved from the PARITY_
STAGING_BUFFER and sent to the PMA. In all other cases, i.e., normal transmission data, the lower
257-bits of the 258-bit block retrieved from the TX_FIFO are sent to the PMA.

SuggestedRemedy

Change to read:

If the retrieved 258-bit block indicates the start of the burst and the ONU is currently not transmissing, laser is turned off and data is being sent towards the PMA for transmission. If the retrieved 258-bit block indicates the end of the burst and the ONU is currently transmissing, the laser is turned off and end of the burst delimiter is sent towards the PMA for transmission. If the retrieved 258-bit block indicates the FEC parity placeholder, the calculated FEC parity is sent towards the PMA for transmission, irrespective of the actual state of the laser. Otherwise, data from the TX_FIFO is sent towards the PMA for transmission.

Proposed Response *Response Status* **O**

Change to read:

If the retrieved 258-bit block indicates the start of the burst and the ONU is currently not transmitting, laser is turned >>[off]->[on]<< and data is being sent towards the PMA for transmission. If the retrieved 258-bit block indicates the end of the burst and the ONU is currently transmitting, the laser is turned off and end of the burst delimiter is sent towards the PMA for transmission. If the retrieved 258-bit block indicates the FEC parity placeholder, the calculated FEC parity and 10 bits of burst delimiter bit pattern are sent towards the PMA for transmission. Otherwise, data from the TX_FIFO is sent towards the PMA for transmission.

Cl **142** *SC* **142.2.5.4.3** *P* **85** *L* **28** # 110

Laubach, Mark Broadcom

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

PMA_SIGNAL.request is used in this paragraph. However, when defined on page 91, line 15, a PMA_SIGNAL[i].request form is used. We should consider being consistent with using the '[i]' form in this clause. Also, the use of '[i]' should be defined/explained somewhere, similar to PMD primitives on Page 40, line 37, clause 141.31. Not sure what to do inside SD Figure 142-15, page 88, line 22.

SuggestedRemedy

I don't have proposed text at this time. If not cleaned up by other comment(s), suggest adding an Editor's note somewhere that the mentions the need for consistency, etc. for the PMA_* primitives.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #24

Cl **142** *SC* **142.2.5.4.3** *P* **88** *L* **11** # 22

Hajduczenia, Marek Charter Communicatio

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

Wrong state name: WAIT_FOR_257B

SuggestedRemedy

Change to WAIT_FOR_CLK to avoid encoding block size in state names - it does not impact state diagram operation

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to WAIT_FOR_BLOCK

Cl **142** *SC* **142.3.1** *P* **86** *L* **45** # 23

Hajduczenia, Marek Charter Communicatio

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

Note to Editor: text and figures extracted from 142.2.2.5.

SuggestedRemedy

It is not clear what text and what figures are intended - in D1.2, 142.2.2.5 contains also state diagrams, definitions, and accompanying text. The original commenter should clarify what is really intended to be olaced in here

Response *Response Status* **C**

REJECT.

AI for Mark and Bill to cover FEC Decoder during the rewrite the FEC section.

Cl **142** *SC* **142.3.5.1** *P* **89** *L* **18** # 26

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **D**

EBD is already defined in 142.2.5.1

SuggestedRemedy

Change definition to read: "See 142.2.5.1." - make link live

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Copy definition from 142.3.5.1 to 142.2.5.1. In 142.3.5.1, use "See 142.2.5.1." and make link live.

AI for Duane and Mark to look at this for 11/14.

Cl **142** *SC* **142.3.5.1** *P* **89** *L* **30** # 27

Hajduczenia, Marek Charter Communicatio

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

FEC_CW_SZ is not defined anywhere before.

SuggestedRemedy

Strike the editorial note

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change FEC_CW_SIZE in SD to FEC_CW_SZ.

Cl **142** *SC* **142.3.5.2** *P* **90** *L* **12** # 88

Kramer, Glen Broadcom

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

Missing definition of rx_buffer. All other buffers in .3ca use names in all caps.

SuggestedRemedy

Add the following definition tgo 142.3.5.2:
RX_BUFFER
TYPE: Array of 10 bits
The RX_BUFFER is an array containing the 10 bits most recently received from the PMA sublayer.

Change rx_buffer to RX_BUFFER throughoyut the draft.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Per comment, but with proper capitalization for variable, i.e., RxBuffer + update other buffer name styles.

Cl **142** *SC* **142.3.5.2** *P* **90** *L* **14** # 80

Kramer, Glen Broadcom

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

Unused variable definitions and incorrect variable names

SuggestedRemedy

1) Delete definition of FecDecodeFail
2) Delete definition of fecDecodeSucceed
3) In 142.3.5.4.2, replace "FecDecodeFaile(d)" with FecDecodeFailure
4) In 142.3.5.4.2, replace "FecDecodeSucceeded" with FecDecodeSuccess

Response *Response Status* **C**

ACCEPT.

Cl **142** *SC* **142.3.5.4.1** *P* **92** *L* **18** # 111

Laubach, Mark Broadcom

Comment Type **T** *Comment Status* **D**

There is space for the drawing for Figure 142-18 "OLT Synchronizer state diagram", but nothing is shown, it is blank and no editor's note. Also shouldn't the "S" be lower case?

SuggestedRemedy

Provide the figure if available or an Editor's note mentioning the intentional absence..

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Mark text and figure in RED to attract attentiion, Editor does not have a figure to place at this time. I believe Duane was supposed to contribute these missing pieces.

*** See remein_3ca_3_1118.pdf for the appropriate figure

Cl **142** *SC* **142.4** *P* **93** *L* **39** # 112

Laubach, Mark Broadcom

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

On the transmit side, the EBD is sent outside (after) the FEC codeword and not processed by the FEC encoder. On the receive side, the EBD must not be processed by FEC_Decode(). An alteration of the state transitions is needed in this SD.

SuggestedRemedy

Change the title of box "CHECK_EBD" to "FEC_DECODE". Move the END_OF_BURST box to the left and extend the left side of the CHECK_IDLE box to the left. Move the arrow labled "PMAUDI[i] = EBD" to the left and extend the top so that it is now connecting CHECK_IDLE with END_OF_BURST. Change the conditions from "PMAUDI[i] = EBD" to "RxClk * !RxIdle * PMAUDI[i] = EBD". Change the label on the arrow from CHECK_IDLE to FEC_DECODE from "RxClk * !RxIdle" to "else". Change the remaining "else" under "FEC_DECODE" to "UCT".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the title of box "CHECK_EBD" to "FEC_DECODE".

Move the END_OF_BURST box to the left and extend the left side of the CHECK_IDLE box to the left.

Move the arrow labled "PMAUDI[i] = EBD" to the left and extend the top so that it is now connecting CHECK_IDLE with END_OF_BURST.

Change the conditions from "PMAUDI[i] = EBD" to "RxClk * !RxIdle * PMAUDI[i] = EBD".

Change the label on the arrow from CHECK_IDLE to FEC_DECODE from "RxClk * !RxIdle" to "RxClk * !RxIdle * PMAUDI[i] != EBD * PMAUDI[i] != SBD".

Change the remaining "else" under "FEC_DECODE" to "UCT".

AI: need still to cover the case of failed EBD detection (Mark?) - may also put an editorial note under the figure.

Cl **143** *SC* **143.2.5** *P* **103** *L* **11** # 121

Powell, Bill Nokia

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

Figure 143-6 still shows four 25 Gb/s channels designated as UC0, UC1, UC2, and UC-3 in a diagram illustrating channel bonding, with peak aggregate rates up to 75/100 Gb/s.

SuggestedRemedy

Remove channels UC2 and UC3 from the diagram, or re-draw with UC0 & UCn, defining n=1 for this standard (i.e. - two 25 Gb/s channels in this standard).

Response *Response Status* **C**

REJECT.

These are examples in a generic section of MCRS description. All Nx25G-EPON specific stuff is located in 143.4.

Per TF minutes from Pittsburgh meeting: "During the discussion following the above two presentations there was a general consensus to make the entire MPRS specification channel independent (i.e., upper number of channels unspecified) and make a formal requirement that for P802.3ca PHYs, the number of channels shall be equal to either 1 or 2."

Cl **143** *SC* **143.2.5** *P* **103** *L* **11** # 115

Laubach, Mark Broadcom

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

Speeds have gone from 100 to 50 Gb/s and chanels from 4 to 2. Eventually, the figures and text need to catch up with this. Page 103, Figure 143-6, Page 103 Line 42, Page 104 Line 3 Figure 143-7, Page 105, Line 3 Figure 143-8, Page 107 Figure 143-9.

SuggestedRemedy

If not fixed in this comment round suggest adding an appropriate Editor's note on Page 103 (or other suitable location) indicating that this work needs to be done.

Response *Response Status* **C**

REJECT.

These are examples in a generic section of MCRS description. All Nx25G-EPON specific stuff is located in 143.4

Per TF minutes from Pittsburgh meeting: "During the discussion following the above two presentations there was a general consensus to make the entire MPRS specification channel independent (i.e., upper number of channels unspecified) and make a formal requirement that for P802.3ca PHYs, the number of channels shall be equal to either 1 or 2."

Cl **143** *SC* **143.2.5** *P* **103** *L* **41** # 122

Powell, Bill Nokia

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

The paragraph below figure 143-6 still refers to
"four chanels with instantaneous transmission rate of 25, 50, 75, or 100 Gb/s…"

SuggestedRemedy

Change last sentence in this paragraph to read:
"For example, a MAC instance connected to an MCRS with two channels of 25 Gb/s each can achieve an instantaneous transmission rate of 25 or 50 Gb/s by varying, in real time, the number of channels that are bonded to send data from a single LLID."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

These are examples in a generic section of MCRS description. All Nx25G-EPON specific stuff is located in 143.4

Per TF minutes from Pittsburgh meeting: "During the discussion following the above two presentations there was a general consensus to make the entire MPRS specification channel independent (i.e., upper number of channels unspecified) and make a formal requirement that for P802.3ca PHYs, the number of channels shall be equal to either 1 or 2."

In Figure 143–18, remove "…" at the PHY level.

Cl **143** *SC* **143.2.5.1** *P* **103** *L* **47** # 171

Wey, Jun Shan ZTE TX

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

This clause gives an example of dynamic channel bonding using the partially overlapping envelopes scenario in Fig 143-6. It would be helpful to readers if this fact is mentioned.

SuggestedRemedy

Revise the sentence:
"The dynamic channel bonding is achieved by interleaving data belonging to a single LLID (i.e., data from a single MAC instance) over multiple envelopes on multiple MCRS channels, as illustrated in Figure 143–7."

To the following:
"The dynamic channel bonding is achieved by interleaving data belonging to a single LLID (i.e., data from a single MAC instance) over multiple envelopes on multiple MCRS channels. Figure 143–7 illustrates a dynamic channel bonding example based on the partially overlapping envelopes scenario in Figure 143-6."

Response *Response Status* **C**

ACCEPT.

Cl **143** *SC* **143.3.2** *P* **110** *L* **54** # 116

Laubach, Mark Broadcom

Comment Type **TR** *Comment Status* **D**

Bits "E" and "K" are mentioned here in the text, but are absent from Table 143-3 on page 112 line 17, yet they are shown in Table 143-4, 143-5, and 143-6. Of the two bits in Table 143-3, which bit is E and which is K?

SuggestedRemedy

Change the Description of bits 46 and 47 Table 143-3 to define bit 46 as E and bit 47 as K. Change "Reserved" to the 802.3 adopted term for "this is being used outside the standard". "Allocated"? I'll check up with other 802.3 folks before .3ca comment resolution completes to clarify.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change the Description of bits 46 and 47 Table 143-3 to define bit 46 as E and bit 47 as K.

AI for Mark to come up with the .3-approved languge for allocation of bits for external use.

Cl **143** *SC* **143.3.2.1** *P* **112** *L* **40** # 117

Laubach, Mark Broadcom

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

For consistency, the terms here should match the terms in Table 143-3, e.g."Block Field Type" doesn't match "Start Control Code" as defined in Table 143-3. Suggest aligning names as needed for consistency.

SuggestedRemedy

Editor's choice for consistency.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "Block Field Type" to "Start Control Code" + change "R" to "reserved" in Table 143–4, Table 143–5, and Table 143–6

Cl **143** *SC* **143.3.3** *P* **114** *L* **30** # 118

Laubach, Mark Broadcom

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

"Figure title placeholder" needs to be changed to the appropriate figure title. Same for Page 122 line 30, Clause 143.3.4.

SuggestedRemedy

At the time of submitting this comment, I don't know what the figure title should be.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Use "MCRS transmit functional block diagram" for Figure 143-12

Use "MCRS receive functional block diagram" for Figure 143-15

Cl **143** *SC* **143.3.3.4** *P* **116** *L* **22** # 207

Remein, Duane Huawei

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

of … of grammar

SuggestedRemedy

change:
"All or some number of lower bits of EnvPam" to:
"All or some number of EnvPam lower bits"

Response *Response Status* **C**

REJECT.

Text reads fine as it is.

Cl **143** *SC* **143.3.3.5** *P* **117** *L* **37** # 78

Kramer, Glen Broadcom

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

Function definition of EnvStartHeader() is incorrect now, since we allow the number of channels to not be a power of 2 and introduced the NUM_CH constant. Also the function has wrong indentation.

SuggestedRemedy

Use function code as shown in kramer_3ca_5_1118.pdf. Note the indentation and the changed code in red.
Also replace "int2" with "int" and add a return type EQ in the definition of EnvContHeader():
"EQ EnvContHeader(int col)"

Response *Response Status* **C**

ACCEPT.

Cl **143** *SC* **143.3.3.5** *P* **118** *L* **6** # 79

Kramer, Glen Broadcom

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

Mising definition of GetFillerEQ, only code is provided. In code, we should use variable col instead of wCol to be consistent with other functions defined in this clause. Argument type is missing too.

SuggestedRemedy

Add function definition and modify the function code as shown in kramer_3ca_6_1118.pdf.

Response *Response Status* **C**

ACCEPT.

Cl **143** *SC* **143.4.1.3.1** *P* **130** *L* **13** # 29

Hajduczenia, Marek Charter Communicatio

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

Definitions need some back reference to where the given values are first defined

SuggestedRemedy

Insert the following text under 143.4.1.3:
For definitions of constants, variables, and functions, see 143.3.3 (trasmit direction) and 143.3.4 (reeive direction).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Use the following text

For definitions of constants, variables, and functions, see 143.3.3 (transmit direction) and 143.3.4 (receive direction).

Cl **143** *SC* **143.4.1.3.2** *P* **130** *L* **30** # 30

Hajduczenia, Marek Charter Communicatio

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

This is not possible: represented by 1-bit integers - an integer requires 1 bit for sign representation.

SuggestedRemedy

Strike "If this optimization is implemented, the variables rRow and wRow are represented by 1-bit integers."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change
"If this optimization is implemented, the variables rRow and wRow are represented by 1-bit integers."
to
"If this optimization is implemented, the variables rRow and wRow are represented by 1-bit unsigned integers."

Cl **143** *SC* **143.4.1.3.3** *P* **130** *L* **35** # 31

Hajduczenia, Marek Charter Communicatio

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

There is very little value on specyfing the ENV_RX values in such an unclear manner. We should specify the maximum value and leave any optimizations for implementers to figure out

SuggestedRemedy

Strike 143.4.1.3.3, use the maximum value specified in 143.3.4.3 (64)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Strike 143.4.1.3.3, use the maximum value specified in 143.3.4.3 (64).

In 143.3.4.3, in ENV_RX,
change
"The maximum number of rows is 64, as determined by the size of EPAM field in Envelope Header (see 143.3.2). For some applications, fewer rows may be sufficient (see application-specific ENV_RX definition in 143.3.3.2)."
to
"The number of rows is 64, as determined by the size of EPAM field in Envelope Header (see 143.3.2)."

On page 116/22, change

All or some number of lower bits of EnvPam are also used as the row index for the ENV_RX buffer into which the received data is to be written (see 143.3.4).

To

EnvPam is also used as the row index for the ENV_RX buffer into which the received data is to be written (see 143.3.4).

Cl **143** *SC* **143.4.4.1** *P* **131** *L* **7** # 33

Hajduczenia, Marek Charter Communicatio

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

Given that 25GMII and XGMII operate using the same set of primitives, everything we need is alreday covered in 143.3.1.1, specifically in Table 143–1 and Table 143–2

SuggestedRemedy

Strike 143.4.4.1 and 143.4.4.2

Response *Response Status* **C**

ACCEPT.

Cl **143** *SC* **143.4.4.3** *P* **131** *L* **11** # 32

Hajduczenia, Marek Charter Communicatio

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

Given that 25GMII and XGMII have the same width and operate only on different clock rates, there is no need to adjust MCRS operation for 10Gb/s

SuggestedRemedy

Strike 143.4.4.3 and associated subclauses

Response *Response Status* **C**

ACCEPT.

Cl **144** *SC* **144.1.4.1** *P* **138** *L* **1** # 172

Wey, Jun Shan ZTE TX

Comment Type **TR** *Comment Status* **D**

In the Layered diagram, there's OAM function between MAC Client and MPMC. It seems the OAM function should also be shown in Fig 144-4, but it's not.

SuggestedRemedy

Discuss and clarify

Proposed Response *Response Status* **W**

PROPOSED REJECT.

OAM is already covered in Clause 56.

Cl **144** *SC* **144.1.4.1** *P* **138** *L* **34** # 76

Kramer, Glen Broadcom

Comment Type **T** *Comment Status* **D**

When we define primitive abbreviations MCSI/MCSR, MCII/MCIR, and MADI/MADR, we need to be more precise with the arguments. We only use operand_list in our state diagrams, while the base definitions of MA_DATA and MA_CONTROL include additional arguments.

SuggestedRemedy

Expand the definitions of MCSI/MCSR, MCII/MCIR, and MADI/MADR to include the list of arguments and add cross-references to the base definitions of MA_DATA in clause 4 and MA_CONTROL in Clause 32. Use the text as shown in kramer_3ca_3_1118.pdf.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.2** *P* **140** *L* **8** # 173

Wey, Jun Shan ZTE TX

Comment Type **TR** *Comment Status* **D**

REPORT Generation/Reception Process functional block is described in the text, but not shown in Figures 144-3 or 144-4.

SuggestedRemedy

Discuss and clarify

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Remove item e) on page 140

Cl **144** *SC* **144.2.1.1** *P* **140** *L* **32** # 209

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

EQT is used but never defined.

WAKE UP FOLKS!: this definition points out the face that EQT changes based on xMII rate.

SuggestedRemedy

Add the following definition in 144.2.1.1:
EQT
TYPE: real number
This constant is equivalent to the time required to transmit one EQ between the MCRS and the PCS of an Nx25G-EPON device. For 25 Gb/s PHYs this is 2.56 ns. For 10 Gb/s PHYs this is 6.4 ns.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add new definitions in 1.4xxx (editor to find the right place), as follows

EQT: The unit of measurement of time for time-related parameters specified in Clause 144 Multipoint MAC Control. Each EQT is equal to the time required to transmit one EQ between the MCRS and the PCS across 25GMII, and equal to 2.56 ns.

EQ: The unit of measurement of volume of information. Each EQ is equal to two 25GMII transfers, i.e., 72 bits.

Add EQT into abbreviations in 1.5

We introduced EQT specifically to represent EQ time at 25Gb/s rate. That is, we decided that EQT is ALWAYS 2.56 ns (see comment #378 from San Diego). LocalTime counter in the OLT is lined to the 25Gb/s TX clock and in the ONU it is locked to 25Gb/s receive clock. All times (timestamp, startTime, laserOn/Off times) are linked to this clock, so are expressed in EQT. There is nothing that ever needs to be expressed in time units of 6.4 ns. Saying that EQT is rate-dependent breaks most state diagrams in C144.

Rather than add EQT/EQ as a constant and embedd somewhere in Clause 144/143, it is better to define it as a new unit.

Cl **144** *SC* **144.2.1.3** *P* **141** *L* **4** # 210

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

This definition is for RTTdelta not RTT.

SuggestedRemedy

Change:
"The RTT value" to:
"The RTTdelta value"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Per comment + apply italics to variable name.

Cl **144** *SC* **144.2.1.3** *P* **141** *L* **29** # 211

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

Given that timestampDrift does not appear in the indirectly referenced SD we seem to be sending the reader on a wild goose chase; "(see ONU Registration state diagram in 144.3.5.8)". A better reference is needed.

SuggestedRemedy

Change:
"(see ONU Registration state diagram in 144.3.5.8)" to
"(see DeregistrationTrigger in 144.3.5.3, Figure 144–22, and Figure 144-23)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.2.1.5** *P* **142** *L* **12** # 212

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

The variable "operand_list" has multiple indirect definitions and is thus ambiguous.

SuggestedRemedy

Provide a concise definition in 144.2.1.3 for this context such as:
"operand_list A set of parameters carried in the payload of an MPCPDU."
Add xRef in 144.3.5.3 and 144.3.6.3

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #76

Cl **144** *SC* **144.2.1.6** *P* **142** *L* **35** # 214

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

What does "MCIR[PLD] refer to? Presumably only MCIRs arriving on the PLID but this is never explained. Furthermore per Fig 144-3 the Control Multiplexer is fed from the ONU Registration Process, how can the Reg-Req happen before the PLID had been assigned in Discovery? In INSERT_TIMESTAMP is a malformed assignment action "Timestamp = LocalTime + RTT[PLID]" but RTT is not available to the ONU which is required to implement the SD so I'm left wondering how this can occur? Lastly 144.2 claims to be "Protocol-independent", and PLID is only associated with MPCP.

SuggestedRemedy

Remove "[PLID]" in exit from WAIT_FOR_MPCPDU.
Change the definition of RTT on pg 141 from:
"RTT
TYPE: 24-bit unsigned integer
This variable holds the measured Round Trip Time to the ONU. The RTT value is represented in units of EQT." to:
"RTT[]
TYPE: 24-bit unsigned integer
In the OLT this variable holds the measured Round Trip Time to the ONU (in units of EQT) and is referenced via the PLID. In the ONU this variable is always set to zero."
Globally replace (case sensitive, whole word) "RTT" with "RTT[PLID]"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Since the comment touches on multiple items, a few detailed explanations are in order

*** What does "MCIR[PLD] refer to? Presumably only MCIRs arriving on the PLID but this is never explained.

That assumption is not correct. In the OLT, Control Multiplexor interfaces with multiple instances of GATE Generation or Registration Completion processes. As the Control Multiplexor gets a request for a specific MPCPDU transmission, it needs to perform certain action that is dependent on which exact instance the request arrived from. For example, it needs to increase the advertised timestamp by the instance-specific RTT value. So, we get PLID instance information from MCIR[PLID](…) primitive. We use the same approach in many places. For example, in C143, MCRS Input SD: MCRS_CTRL[wCol].Request(…) – is a request received for channel “wCol”.

*** Furthermore per Fig 144-3 the Control Multiplexer is fed from the ONU Registration Process, how can the Reg-Req happen before the PLID had been assigned in Discovery?

Figure 144-3 describes OLT block diagram. Figure 144-4 describes the ONU. Before the ONU completed its discovery, it operates with DISC_PLID, which from Control Multiplexor SD point of view is just another instance of an interface to a higher layer block. This fact will be addressed by adding an explicit statement to the definition of RTT, indicating that at the

OLT, RTT[DISC_PLID] is always zero.

*** In INSERT_TIMESTAMP is a malformed assignment action "Timestamp = LocalTime + RTT[PLID]" but RTT is not available to the ONU which is required to implement the SD so I'm left wondering how this can occur?

Nothing is malformed in this action. In the ONU, RTT[PLID] is always zero. This fact will be addressed by adding an explicit statement to the definition of RTT, indicating that at the ONU, RTT[PLID] is always zero.

*** Lastly 144.2 claims to be "Protocol-independent", and PLID is only associated with MPCP.

Replace “[PLID]” with “[LLID]”, so we can process requests from either PLID-related interfaces (MPCP discovery, MPCP granting) or MLID-related interfaces (CCP). Our MAC Control never sees any data frames.

Cl **144** *SC* **144.3.1.1** *P* **143** *L* **7** # 92

Kramer, Glen Broadcom

Comment Type **TR** *Comment Status* **D**

The section on ranging and time synchronization is empty. A new text is provided. Also, there needs to be a section related to time synchronization in C143 MCRS.

SuggestedRemedy

1) Use text in kramer_3ca_2_1118.pdf for subclause 144.3.1.1 (note the changed title)
2) Include a new sub-clause "143.2.6 MCRS Time synchronization" as shown in kramer_3ca_1_1118.pdf

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.2.2** *P* **143** *L* **30** # 215

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

We clearly state that PLIDs are unique but don't for MLIDs, which also must be unique.

SuggestedRemedy

Change "a single MLID value" to: "a single unique PLID value"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "a single MLID value" to: "a single unique MLID value"

Cl **144** *SC* **144.3.2.4** *P* **143** *L* **51** # 216

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

It should be clear that multicast ULIDs are excluded from GLID grants.

SuggestedRemedy

Change:
"or a ULID value" to:
"or a unicast ULID value"
Change on line 52:
"PLID, MLID, or ULID," to:
"PLID, MLID, or unicast ULID,"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

There is no separate class of multicast ULIDs. All ULIDs are provisioned in ONUs by NMS. If NMS provisions the same ULID value in several ONUs, then this ULID becomes multicast ULID in the downstream. An ONU would never know if any particular ULID is assigned to it exclusively or not. However, in the upstream, the OLT may grant each such ULID separately, because GATEs always come under unique PLID envelopes, so only one ONU would response to an envelope allocation that has multicast ULID. So, our architecture is flexible and no special restrictions are needed, as noting breaks. If anyone doesn’t want to grant unicast IULIDs, then they just should not.

It is not clear why such an exclusion would be made. Please present your case at the meeting.

Cl **144** *SC* **144.3.3** *P* **144** *L* **8** # 217

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

This definition of LLID = 0x0000 should be broader that just GATE and MCRS_CTRL.request primitives

SuggestedRemedy

Change:
"A reserved PLID value indicating an empty EnvAlloc[n] field in a GATE MPCPDU. ESC_PLID is also used in MCRS_CTRL.request primitive to mark the end of upstream burst." to:
"A reserved LLID value indicating an unused or empty LLID or MPCPDU field which includes an LLID. In particular the ESC_PLID is used in the GATE MPCPDU to indicate an empty EnvAlloc[n] field and in the REPORT MPCPDU to indicate an empty LLIDstatus field. The ESC_PLID is also used in MCRS_CTRL.request primitive to mark the end of an upstream burst."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The proposed text is much more confusing. Please present the reason for the requested change, and not just state it "should be broader". It is not clear why that is

Cl **144** *SC* **144.3.4** *P* **144** *L* **45** # 218

Remein, Duane Huawei

Comment Type **ER** *Comment Status* **D**

The outline of 144.3.4 does not match that agree in cmt # 548.

SuggestedRemedy

Follow the outline per the comment (i.e., kramer_3ca_3_0918)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Current outline follows Opcode value allocated to each and every message.

Cl **144** *SC* **144.3.4** *P* **145** *L* **13** # 90

Kramer, Glen Broadcom

Comment Type **TR** *Comment Status* **D**

"Octets within each field are transmitted from least significant to most significant."

Specifying the octet order this way was a mistake. It goes against the existing requirements in 802.3:

3.2.6: "The Length/Type field is transmitted and received with the high order octet first."
31B.2 pause_time: "The field is transmitted most significant octet first,..."
57B.1 OAMPDUs: "When consecutive octets are used to represent a numerical value, the most significant octet is transmitted first, followed by successively less significant octets."

SuggestedRemedy

Replace "Octets within each field are transmitted from least significant to most significant." with
"When consecutive octets are used to represent a numerical value, the most significant octet is transmitted first, followed by successively less significant octets."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.4.1** *P* **145** *L* **50** # 221

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Items a - d.4 are already part of a requirement; "The GATE MPCPDU is an instantiation of the Generic MPCPDU and shall be as shown in Figure 144–8 with details defined as follows:" what is the point of a requirement within a requirement?
“When multiple channels are assigned in a single GATE MPCPDU, the transmission on each channel shall start at Grant Start Time and shall have the length as necessary ...”

SuggestedRemedy

change:
“When multiple channels are assigned in a single GATE MPCPDU, the transmission on each channel shall start at Grant Start Time and shall have the length as necessary ...” to:
" All channels assigned in a single GATE MPCPDU have the same Grant Start Time and length as necessary ...”

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

“When multiple channels are assigned in a single GATE MPCPDU, the transmission on each channel shall start at Grant Start Time and shall have the length as necessary ...”
to:
“When multiple channels are assigned in a single GATE MPCPDU, the transmission on each channel shall start at grant start time and have the length as necessary ...”

Channels don’t have Start times and lengths. Only transmissions on each channel can be characterized by start times and transmission lengths.

Cl **144** *SC* **144.3.4.1** *P* **146** *L* **27** # 222

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

I can find no mention of the active state of this flag.
There is also a small ambiguity here. If a frame has already been fragmented, and the grant is not large enough to transmit the entire remaining fragment, and the Fragment flag is set to prohibit fragmentation, what should the ONU do? I submit that it should transmit as much of the remaining fragment as possible as the buffer on the receive side has already been allocated so there is no need to avoid transmitting the fragment.

SuggestedRemedy

Change:
"This flag informs the ONU whether it is allowed to fragment new frames transmitted on the given LLID." to:
"When set to 1 this flag informs the ONU it is allowed to fragment new frames transmitted on the given LLID. When "set to 0 transmission of new fragments are prohibited."
Add at the end of the last sentence: " even if the EnvLength is not sufficient to contain the entire remaining fragment"
(EnvLength s/b in italics)
While mucking about here ensure that "Fragmentation" does not split the line.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change bullet 3) to read as follows

Fragmentation (F): When set to 1, this flag informs the ONU it is allowed to fragment new frames transmitted on the given LLID. If a frame fragment remains queued in this LLID since previous envelope transmission, this fragment is transmitted first, regardless of the value of the Fragmentation flag.

Use proper variable format (italics).

Cl **144** *SC* **144.3.4.3** *P* **148** *L* **54** # 223

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Optional indication in a requirement ("should" under a "shall"):
"The OLT should not grant …"

SuggestedRemedy

Change:
"The OLT should not grant" to:
"The OLT does not grant"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The first “shall” is the message format requirement. The second “should” is behavior requirement. Without the second “should” there will be no normative requirement for the OLT’s behavior. We used exactly the same approach in .3av.

Cl **144** *SC* **144.3.4.3** *P* **149** *L* **3** # 224

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

We have two closely related tables that define "Discovery Information Fields"; Table 144–4 & Table 144–7. This becomes especially confusing when reading 144.3.5 which refers to both fields in the opening three paras. It would be clearer for the reader if these fields used different names.

SuggestedRemedy

In 144.3.4.3 REGISTER_REQ description change "Discovery Information" to "Register Request Information".
In the 2nd & 3rd para of 144.3.5 Discovery Process change "Discovery Information" to "Register Request Information".
In Figure 144–15—Discovery handshake message exchange change
"content = Pending Envelopes + Discovery Information +" to
"content = Pending Envelopes + Register Request Information +"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.4.3** *P* **149** *L* **23** # 225

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

If Laser On/Off Time is really a time then this should be in EQT not EQ.

SuggestedRemedy

Change in 2 places:
"in the units of 1 EQ" to:
"in the units of EQT"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.4.4** *P* **151** *L* **2** # 228

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Optional indication in a requirement ("should" under a "shall"):
"The OLT should not grant …"

SuggestedRemedy

Change:
"The OLT should not grant" to:
"The OLT does not grant"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The first “shall” is the message format requirement. The second “should” is behavior requirement. Without the second “should” there will be no normative requirement for the OLT’s behavior. We used exactly the same approach in .3av.

Cl **144** *SC* **144.3.4.4** *P* **151** *L* **4** # 229

Remein, Duane Huawei

Comment Type **E** *Comment Status* **D**

Wording "This is an 16-bit field, value-encoded to indicate the number of times"

SuggestedRemedy

change to "This 16-bit field's value indicates the number of times" in 6 places

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Nothing wrong with the text as is.

Cl **144** *SC* **144.3.4.6** *P* **153** *L* **9** # 234

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

What does this sentence mean; "Discovery Information field presents the internal structure of the Discovery Information flag field."?

SuggestedRemedy

Change:
"Discovery Information field presents the internal structure of the Discovery Information flag field." to:
"Table 144–7 presents the internal structure of the Discovery Information flag field."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Per comment + change title of Table 144-7 to read "Discovery Information field"

Cl **144** *SC* **144.3.4.7** *P* **154** *L* **36** # 236

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

The SYNC_PATTERN MPCPDU should be required.

SuggestedRemedy

Change
"Generic MPCPDU, and is further defined as follows:" to:
"Generic MPCPDU and shall be as shown in Figure 144–14 with details defined as follows:"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.4.7** *P* **154** *L* **39** # 237

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Is this a case of crossed names?
"PatternInfo: This is a 16-bit field, with individual bits defined per SpInfo field value"
Table 144-8 is not referenced.

SuggestedRemedy

Change all (3-4) instances of "PatternInfo" to "SpInfo"
Change:
"defined per SpInfo field value" to:
"defined per Table 144-8"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #40.

Cl **144** *SC* **144.3.4.7** *P* **154** *L* **48** # 265

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Table 144-8 should make it clear that Count must be the same for each MPCPDU in a set.

SuggestedRemedy

Add to "Indicates the number of Sync Pattern elements in a burst. The valid values are 2 or 3."
"The count field is the same for all SYNC_PATTERN MPCPDUs describing a single Sync Pattern (SP1, SP2 and optionally SP3)."
Follow whatever decision is taken on subscripting SP1, SP2 and SP3.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

MPCPDU is just a data unit and as such, has no notion of past or future messages and their values. The target behavior is already covered in Figure 144-21, line 15, and no new requirements in text are needed.

Cl **144** SC **144.3.4.7** P **155** L **12** # 266

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

It would make more sense to have Octets <31:0> map to bits <255:0> and use bit 15 of PatternInfo (or SpInfo as the case may be) for bit 256 rather than 0.

Admittedly this is a somewhat trivial change for HW but is more straight forward imho.

SuggestedRemedy

In Table 144–8 change bit 15 definition to "Value, bit 256" and "Carries the last (index 256) bit of the Sync Pattern value."
Change "c)" to read "Value: This is a 32-octet field, containing right-justified bits 0 through 255 of the Sync Pattern element (SP1, SP2, or (if present) SP3), where bit 256 of the Sync Pattern is carried in the SpInfo field. The allocation of remaining 255 bits in the Value field is shown in Sync Pattern placement in T able 144–9.
Change indexes in Table 144-9 accordingly to SP<7:0>, SP<247:240>, and SP<255:248>.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Current bit allocation is precisely optimized for HW implementation. This was discussed in detail when SYNC_PATTERN was first presented to the group.

Cl **144** SC **144.3.5** P **156** L **8** # 38

Hajduczenia, Marek Charter Communicatio

Comment Type **E** *Comment Status* **D**

Missing reference updates in lines 8 and 23

SuggestedRemedy

Replace 77.3.6.1 with 144.3.4.6
Replace 77.3.6.3 with 144.3.4.3

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** SC **144.3.5** P **156** L **8** # 267

Remein, Duane Huawei

Comment Type **E** *Comment Status* **D**

Fix xRef. 77.3.6.1

SuggestedRemedy

Change to Table 144–7 (included in remein_3ca_1_1118.pdf)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #38

Cl **144** SC **144.3.5** P **156** L **10** # 268

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Two data rates are only supported in the downsteam direction.

SuggestedRemedy

Change:
"the given transmission direction" to:
"the downstream direction"
(included in remein_3ca_1_1118.pdf)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Incorrect. The text speaks of lines rate values possible in upstream that can be reported during the discovery window. OLT may pre-tune to 25Gb/s RX or 10Gb/s RX TIA/LA, so two line rates possible in the upstream.

Cl **144** SC **144.3.5** P **156** L **23** # 269

Remein, Duane Huawei

Comment Type **E** *Comment Status* **D**

Fix xRef. 77.3.6.3

SuggestedRemedy

Change to Table 144–4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #38

Cl **144** *SC* **144.3.5** *P* **156** *L* **29** # 270

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Time should be in time units not bits "Laser On
Time and Laser Off Time fields, where both values are expressed in the units of 1 EQ"

SuggestedRemedy

Change "1 EQ" to "EQT".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

No need to repeat. Unit are defined where fields are specified.

Strike ", where both values are expressed in the units of 1 EQ"

Cl **144** *SC* **144.3.5** *P* **157** *L* **9** # 40

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **D**

No such field: SpInfo

SuggestedRemedy

Change all instances to PatternInfo

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.5** *P* **157** *L* **32** # 273

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

In REGISTER message SP3Length should reference footnote 3.

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED REJECT.

SP3Length is not an optional field - it is always present, but if only two zones are present, it is set to 0.

Cl **144** *SC* **144.3.5** *P* **157** *L* **49** # 39

Hajduczenia, Marek Charter Communicatio

Comment Type **T** *Comment Status* **D**

Note uses wrong field name: SPCount is no more

SuggestedRemedy

Change SpCount to Count (see Table 144–8)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change SpCount to Count field

Cl **144** *SC* **144.3.5** *P* **158** *L* **27** # 41

Hajduczenia, Marek Charter Communicatio

Comment Type **TR** *Comment Status* **D**

Figures 144-16,-17,-18,-19,-20 are not needed anymore, given that individual interfaces are specified in a more consistent manner in SDs

SuggestedRemedy

Remove the figures

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.5.1** *P* **160** *L* **33** # 275

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D** *EQTs*

DISCOVERY_MARGIN measured in EQTs is stated to be 205 us. However this is only true if the ONU is operating at 25G for a 10G ONU it will be closer to 512 us.

SuggestedRemedy

There are several approaches to fixing this. One would be to define DISCOVERY_MARGIN in ns and convert to EQT in the SD by doing an integer division by EQT. Another would be to leave this as a constant with a value of 80,078 and change the note to indicate the time difference depending on the ONU rate. Other solutions could be suggested.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

We introduced EQT specifically to represent EQ time at 25Gb/s rate. We decided that EQT is >>ALWAYS<< 2.56 ns long (see comment #378 from San Diego meeting. LocalTime counter in the OLT is lined to the 25Gb/s TX clock and in the ONU it is locked to 25Gb/s receive clock. All times (timestamp, startTime, laserOn/Off times) are linked to this clock, so are expressed in EQT. There is nothing that ever needs to be expressed in time units of 6.4 ns. Saying that EQT is rate-dependent breaks most state diagrams in C144.

Cl **144** *SC* **144.3.5.3** *P* **161** *L* **41** # 240

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

Several issues with "This variable indicates the ONU local time at which it REGISTER_REQ MPCPDU is to be transmitted." Most importantly what is "local time"?

SuggestedRemedy

change:
"This variable indicates the ONU local time at which it REGISTER_REQ MPCPDU is to be transmitted" to:
"This variable indicates the LocalTime at which the ONU is to transmit the REGISTER_REQ MPCPDU."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

local time (at the ONU) is a concept. LocalTime is a name of a variable that holds a value of local time. Original text reads OK as is.

Cl **144** *SC* **144.3.5.4** *P* **162** *L* **9** # 243

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

Clarification "e) The FEC Parity overhead"

SuggestedRemedy

Add " including the FEC_CW_DELIM."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

FEC_CW_DELIM is a constant that has a value 0x3CA (970), so adding it to the statememnt does not make much sense ("FEC Parity overhead including 970"???).

Use the following updated statement: "The FEC Parity overhead, including 10 bits of FEC codeword delimiter"

Cl **144** *SC* **144.3.5.6** *P* **163** *L* **3** # 247

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

"instance the Discovery Initiation" should be "instance of the OLT Discovery Initiation"

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change “shall implement a single instance the Discovery Initiation” to “shall implement a single instance of the Discovery Initiation”

Cl **144** *SC* **144.3.5.7** *P* **164** *L* **3** # 249

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

These two requirements can be combined.

SuggestedRemedy

Change:
"The Discovery Process in the OLT shall implement multiple instances of the Registration Completion state diagram shown in Figure 144–22. Each instance of the Registration Completion state diagram shall be associated with the unicast PLID being registered." to:
"The Discovery Process in the OLT shall implement multiple instances of the Registration Completion state diagram shown in Figure 144–22 where each instance is associated with a unicast PLID being registered."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.5.8** *P* **165** *L* **22** # 255

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Exit criteria from PASS_DISC_TO_CLIENT reading "LocalTime = ReqStart" is incorrect.

SuggestedRemedy

Change to "LocalTime ≥ RegStart" (i.e., use greater than or equal symbol).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The MPCP_PROCESSING_DLY is the time that the ONU is given to generate a response, such as generating REPORT after receiving a GATE. The commenter's suggestion is for the ONU to generate REGISTER_REQ in such a way that the ONU still has MPCP_PROCESSING_DLY time left to spare. That is, it makes ONU processing requirement more stringent by MPCP_PROCESSING_DLY, decreasing the time ONU has to react to the message received. Note that the REGISTER_REQ message is typically generated in software and requires a lot of internal processing (such as reading its RSSI in .3ca, parsing and processing Discovery Information field, and deciding if the ONU is allowed to participate in this discovery).

See also comment #254, which points to the same location, comes from the same commenter, but proposes a different solution (???)

Cl **144** *SC* **144.3.5.8** *P* **165** *L* **22** # 254

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Exit criteria from PASS_DISC_TO_CLIENT assumes that the DISCOVERY MPCPDU is received before RegStart and any time the ONU needs to setup the REGISTER_REG.

SuggestedRemedy

Change:
"LocalTime = ReqStart: to:
"RegStart: <= LocalTime + MPCP_PROCESS_DLY" (Note this assumes ReqStart is replaced with RegStart per another cmt)
Move the definition of MPCP_PROCESS_DLY to 1445.3.5 and replace the definition in 144.3.6.1 with a cross ref.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Current state diagram operates as intended.

After the MsgDiscovery is passed to the MAC Control Client, the SD waits in PASS_DISC_TO_CLIENT state. Two things may happen: (1) we get MsgRegisterReq from the Client in time to participate in this discovery attempt, or (2) localTime reached the time when ONU need to send the REGISTER_REQ MPCPDU, but the SD did not get the MsgRegisterReq from the client. In the first case, we proceed with the discovery. In the second case, we abort the attempt and go back to waiting for SYNC_PATTERNs.

The ONU is allowed to use all available time until the ReqStart to generate MsgRegisterReq, so if this time is larger than MPCP_PROCESS_DLY, all the better for the ONU. There is no need to artificially restrict ONU to a shorter time.

Cl **144** *SC* **144.3.5.8** *P* **165** *L* **22** # 253

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

Undefined variable ReqStart appears 4x.

SuggestedRemedy

Replace with RegStart which is well defined.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.3.5.8** *P* **165** *L* **25** # 257

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

Issuing a new Sync Pattern MPCPDU prior to completion of a previously issued Discovery Windw (including response time of OLT to Register Req from an ONU) will cause a registration attempt by ONUs that have not received the Register message to be aborted (see exit from ISSUE_REGISTER_REQ in Fig 144-23). This should be noted in the description of the Discovery and Sync Pattern messages. Furthermore the Discovery Process really begins with the Sync Pattern MPCPDU not the DISCOVERY MPCPDU as in previous generations. This information should come early in 144.3.5 and not as a after thought at the end.

SuggestedRemedy

See remein_3a_1_1118.pdf (also available in MS Word).
Note SP1, SP2, and SP3 are not subscripted in this file.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The state diagram operates as designed.

Cl **144** *SC* **144.3.6.1** *P* **165** *L* **47** # 259

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D** *EQTs*

MPCP_PROCESS_DLY measured in EQTs is stated to be 16.384 us. However this is only true if the ONU is operating at 25G for a 10G ONU it will be closer to 41 us.

SuggestedRemedy

There are several approaches to fixing this. One would be to define MPCP_PROCESS_DLY in ns and conver to EQT in the SD by doing an interger division by EQT. Another would be to leave this as a constant with a value of 6,400 and change the note to indicate the time difference depending on the ONU rate. Other solutions could be suggested.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

We introduced EQT specifically to represent EQ time at 25Gb/s rate. We decided that EQT is >>ALWAYS<< 2.56 ns long (see comment #378 from San Diego meeting. LocalTime counter in the OLT is lined to the 25Gb/s TX clock and in the ONU it is locked to 25Gb/s receive clock. All times (timestamp, startTime, laserOn/Off times) are linked to this clock, so are expressed in EQT. There is nothing that ever needs to be expressed in time units of 6.4 ns. Saying that EQT is rate-dependent breaks most state diagrams in C144.

Cl **144** *SC* **144.3.6.1** *P* **166** *L* **8** # 260

Remein, Duane Huawei

Comment Type **T** *Comment Status* **D**

Clarification "e) The FEC Parity overhead (see <TBD???>)"

SuggestedRemedy

Replace "(see <TBD???>)" with "including FEC_CW_DELIM."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

FEC_CW_DELIM is a constant that has a value 0x3CA (970), so adding it to the statememnt does not make much sense ("FEC Parity overhead including 970"???).

Use the following updated statement: "The FEC Parity overhead, including 10 bits of FEC codeword delimiter"

Cl **144** *SC* **144.3.6.1** *P* **166** *L* **47** # 262

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D** *EQTs*

GATE_TIMEOUT measured in EQTs is stated to be 50 ms. However this is only true if the ONU is operating at 25G for a 10G ONU it will be closer to 125 ms.

SuggestedRemedy

There are several approaches to fixing this. One would be to define GATE_TIMEOUT in ns and conver to EQT in the SD by doing an interger division by EQT. Another would be to leave this as a constant with a value of 19,531,250 and change the note to indicate the time difference depending on the ONU rate. Other solutions could be suggested.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

We introduced EQT specifically to represent EQ time at 25Gb/s rate. We decided that EQT is >>ALWAYS<< 2.56 ns long (see comment #378 from San Diego meeting. LocalTime counter in the OLT is lined to the 25Gb/s TX clock and in the ONU it is locked to 25Gb/s receive clock. All times (timestamp, startTime, laserOn/Off times) are linked to this clock, so are expressed in EQT. There is nothing that ever needs to be expressed in time units of 6.4 ns. Saying that EQT is rate-dependent breaks most state diagrams in C144.

Cl **144** *SC* **144.3.6.3** *P* **167** *L* **3** # 89

Kramer, Glen Broadcom

Comment Type **ER** *Comment Status* **D**

State diagrams 144-26 and 144-27 use EnvList[ChIndex], but there is no standalone variable ChIndex. This variable is a subfield of MsgEnvDescriptor.

Also, we have several structures that have start time fields in them having different names: GrantStartTime, EnvStartTime, StartTime. These names are not used in a consistent manner and it is confusing to have different field names to represent the same concept.

Finally, MsgEnvDescriptor actually carries a group of envelope descriptors, so a better name would be MsgEnvGroup.

SuggestedRemedy

1) In SDs 144-26 and 144-27, replace MsgEnvDescriptor with MsgEnvGroup
2) In SDs 144-26 and 144-27, replace EnvList[ChIndex] with EnvList[MsgEnvDescriptor.ChIndex] (3 locations total)
3) Use StartTime for all fields that carry start times, regardless of what message or structure they are part of.

The exact list of changes is shown in kramer_3ca_7_11_18.pdf

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

1) In SDs 144-26 and 144-27, replace MsgEnvDescriptor with MsgEnvGroup
2) In SDs 144-26 and 144-27, replace EnvList[ChIndex] with EnvList[MsgEnvGroup.ChIndex] (3 locations total)
3) Use StartTime for all fields that carry start times, regardless of what message or structure they are part of.

Cl **144** *SC* **144.3.6.3** *P* **167** *L* **19** # 263

Remein, Duane Huawei

Comment Type **TR** *Comment Status* **D**

This definition seems backwards "EnvList[ch].IsEmpty(): this function returns true if EnvList[ch] list has any envelopes descriptors, otherwise, false is returned;" Why return True for IsEmpty if the FIFO is not empty?
Also this does not appear to be consistent with it's use in Envelope Activation state diagram.

SuggestedRemedy

Change to: "EnvList[ch].IsEmpty(): this function returns true if EnvList[ch] list does not have any envelopes descriptors, otherwise, false is returned;"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **144** *SC* **144.4** *P* **171** *L* **53** # 68

Hajduczenia, Marek Charter Communicatio

Comment Type **TR** *Comment Status* **D**

Missing content of 144.4 Channel Control Protocol subclause

SuggestedRemedy

Adopt changes per hajduczenia_3ca_2_1118.pdf, with explanation of the CCP operation, behavioral assumptions, etc. included in hajduczenia_3ca_1_1118.pdf. This is a joint contribution from Glen and myself.
Note the change of existing ChStatus variable to ChState to align terminology with CCP operation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.