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<td>A</td>
<td>From Peter: The 802.3 web page has: Since Boolean is named after George Boole the capitalization Boolean should always be used (and not boolean) with the exception of the MIB clauses and annexes described below. Search and replace throughout the draft.</td>
</tr>
<tr>
<td></td>
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<td>111</td>
<td>49</td>
<td>3517</td>
<td>E</td>
<td>A</td>
<td>Change the following locations to include the definition: Cl 100 pg 87 In 23 so the line reads: &quot;sumonation of bit per subcarrier for all active subcarriers (subcarriers that are not configured as excluded are active subcarriers).&quot; Cl 101 pg 160 In 49 so the line reads: &quot;that are configured to carry data (subcarriers that are not configured as excluded are active subcarriers). See 101.4.2.8. Remove all other instances of the phrase.</td>
</tr>
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<td>214</td>
<td>24</td>
<td>3599</td>
<td>T</td>
<td>A</td>
<td>Add PICS for Clause 101, 102 &amp; update PICS in 103</td>
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</table>

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
### IEEE 802.3bn EPON Protocol over Coax (EPOC) TF 4th Task Force review comments

<table>
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<td>A</td>
<td>PhyLnkRspTm is not reflected in CL 45 registers. However PhyLnkRspTm is defined as 16 bits in Cl 102 pg 241 ln 11 which equates to 300+ us. Whereas on pg 238 ln 35 the is a max response time of 4.8 ms.</td>
<td>Add new register 45.2.1.aaa PHY Link Response Time register (Register 1.19xx). The assignment of bits in the PHY Link Response Time register is shown in Table 45-xxx. Bits 1.19x15.0 indicate the amount of time needed by the upstream PHY Link to respond to an EPOC MessageBlock instruction in the downstream PHY Link. These bits are a reflection of the PhyLnkRspTm variable defined in 102.2.6.3. Add new table for Registers 1.19xx &amp; 1.19xy Add variable and CI 45 cross reference to Table 102-3 Change definition of PhyLnkRspTm from: &quot;in OFDM clocks&quot; to &quot;in units of 78.125 ns (12 x 1/204.8)&quot;</td>
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<td>1</td>
<td></td>
<td>T</td>
<td>A</td>
<td>Make sure the use of RBsize and definitions are all TRUE and FALSE not &quot;1&quot; and &quot;0&quot; respectively throughout the draft. As per 101.4.3.3.5 (page 188), TRUE is for 16 symbols, and FALSE is for 8 symbols.</td>
<td>Editors: make it so.</td>
</tr>
</tbody>
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### Final Responses

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<td>A</td>
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<td>T</td>
<td>A</td>
<td>If we are consistently using FEC Encoder we should probably also use FEC Decoder universally. Likewise for 64B/66B encode(r) and 64B/66B decode(r)</td>
<td>Globally replace &quot;FEC decode&quot; (3x) and &quot;FEC decoder&quot; (18x) with &quot;FEC Decoder&quot; &quot;64B/66B encode&quot; (1x) and 64B/66B encoder (2x) with &quot;64B/66B Encoder&quot; &quot;64B/66B decode&quot; (1x) and 64B/66B decoder (11x) with &quot;64B/66B Decoder&quot;</td>
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</tbody>
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<table>
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<th>CI</th>
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<td>00</td>
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<td>Make sure the use of RBsize and definitions are all TRUE and FALSE not &quot;1&quot; and &quot;0&quot; respectively throughout the draft. As per 101.4.3.3.5 (page 188), TRUE is for 16 symbols, and FALSE is for 8 symbols.</td>
<td>Editors: make it so.</td>
</tr>
</tbody>
</table>
Comment Type  T  Comment Status  A

CRC40ErrCtrl  Rev

Apparently "every 8th block" in the following confuses some folks:

"If CRC40ErrCtrl is TRUE and the calculated value of CRC40 does not match the value of CRC40 retrieved from the received FEC codeword, the FEC decoder replaces bit <0> and <1> in the sync headers in first 64B/66B block and every 8th 64B/66B block, e.g. 1st, 9th, 17th, 25th, etc. as well as the last 64B/66B block from the errored FEC codeword with the binary value of "11"."

Suggested Remedy

Change 45.2.1.131.2 to read:

"Bit 1.1900.2 is used to control marking of frames with CRC40 errors to higher layers as described in 101.3.3.1.4."

Remove the Editors note

In Cl 101, SCI 101.3.3.1.4, pg 149, In 28 change sentence to read:

"If CRC40ErrCtrl is TRUE and the calculated value of CRC40 does not match the value of CRC40 retrieved from the received FEC codeword, the FEC decoder replaces bit <0> and <1> in the sync headers in first 64B/66B block and every 8th 64B/66B block, (i.e., if Mod(N/8) = 1 where Mod return the remainder and N is the block number) as well as the last 64B/66B block from the errored FEC codeword with the binary value of "11"."

Response  C

ACCEPT IN PRINCIPLE.

Make change in CL 45 only.
Add new registers and variables to support TimeSync.

### Suggested Remedy

45.2.1.160 PHY Delay registers (1.1948 through 1.1949)

The assignment of bits in the PHY Delay registers is shown in Table 45-98ad.

<table>
<thead>
<tr>
<th>Bit(s)</th>
<th>Name</th>
<th>Description</th>
<th>R/Wa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1948.15:0</td>
<td>PHY differential delay lower</td>
<td>Difference in delay between XGMII to MDI path and MDI to XGMII path, low order</td>
<td>RO</td>
</tr>
<tr>
<td>1.1949.3:0</td>
<td>PHY differential delay upper</td>
<td>Difference in delay between XGMII to MDI path and MDI to XGMII path, high order</td>
<td>RO</td>
</tr>
<tr>
<td>1.1949.15:4</td>
<td>PHY differential delay precision</td>
<td>Precision of PHY differential delay</td>
<td>RO</td>
</tr>
</tbody>
</table>

45.2.1.160.1 PHY differential delay (1.1948.15:0 through 1.1949.3:0)

Bits 1.1948.15:0 and 1.1949.3:0 form a 20-bit signed integer that the PHY manufacturer uses to declare the difference in delay between the XGMII interface to the MDI interface path and the MDI interface to the XGMII interface path in units of 1/204.8 MHz. These bits are a reflection of the DiffDelay variable.

45.2.1.160.2 XGMII to MDI delay tolerance (1.1949.15:4)

Bits 1.1949.15:4 form a 12-bit integer that the PHY manufacturer uses to declare the tolerance of the PHY differential delay parameter in units of 1/204.8 MHz. These bits are a reflection of the DiffDelay Tol variable.

---

Page 115 Line 26 Change

"100.6 Timesync capability" To "100.6 Time of day synchronization capability See 101.6 for PHY requirements pertaining to time of day synchronization."

Page 214 Line 17 Change

"101.6 Time of day synchronization capability" To "101.6 Timesync capability"

Add two items to PICS based on the above option and conditional requirement.

Add:

101.6.1 Variables

DiffDelay

TYPE: 20-bit signed integer

---

This variable declares the difference in delay between the XGMII interface to the MDI interface path and the MDI interface to the XGMII interface path in units of 1/204.8 MHz. The variable may be updated by the PHY when any of the parameters listed in Table 102-13 are changed.

**DiffDelayTol**

TYPE: 12-bit integer

This variable declares the tolerance of the DiffDelay variable in units of 1/204.8 MHz. The variable may be updated by the PHY when any of the parameters listed in Table 102-13 are changed.*

**Proposed Response**

**Response Status** Z

REJECT.

This comment was WITHDRAWN by the commenter.
Comment Type: T  Comment Status: A  TimeSync  Rev
Add new registers and variables to support Timesync.

SuggestedRemedy

Add:

45.2.1.161 PHY Link Differential TS registers (1.1950 through 1.1951)
The assignment of bits in the PHY Link Differential TS registers is shown in Table 45-98ae.

Table 45-98ae PHY Link Differential TS registers bit definitions
Bit(s) | Name | Description | R/Wa
1.1950.15 | PHY Link differential TS Valid | Value of PHY Link differential TS is valid | RW
1.1950.14:8 | Reserved | Value always 0 | RO
1.1950.7:0 | PHY Link differential TS | Difference between LocalTS and received timestamp | RO
1.1951.15 | Reserved | Value always 0 | RO
1.1951.14:0 | CNU to Capture[b] | CNU on which to capture | PHY Link differential TS | RW
ar/W = Read/Write, RO = Read Only
valid only for CLT, in CNU this register is reserved and always read as zero.

45.2.1.161.1 PHY Link differential TS Valid (1.1950.15)
When bit 1.1950.15 has a value of 1 it indicate that the value in PHY Link differential TS is valid. When this bit is 0 the value in PHY Link differential TS may be invalid. This bit is a reflection of the PhyLnkDiffTS_Valid variable defined in 101.6.1.

45.2.1.161.2 PHY Link differential TS (1.1950.7:0)
Bits 1.1950.7:0 report the difference between the LocalTS (see 102.2.6.2) and the value of the timestamp received in the PHY Link message. These bits are a reflection of the PhyLnkDiffTS variable defined in 101.6.1.

45.2.1.161.3 CNU to Capture (1.1951.14:0)
Bits 1.1951.14:0 indicate on which CNU the value of PhyLnkDiffTS is calculated. Only for timestamps received from the CNUs whose CNU_ID matches the value of these bits are used in the calculation. These bits are only valid in the CLT, in the CNU they are reserved and always read as zero. These bits are a reflection of the PhyLnkDiffTS_CNU variable defined in 101.6.1.

Add to 101.6.1:
*PhyLnkDiffITS
Type: 8-bit signed integer
This variable records the difference between the LocalTS and the timestamp in the most recently received PHY Link message. In the CLT the value is calculated only for the CNU indicated by the PhyLnkDiffTS_CNU variable and is only valid when PhyLnkDiffTS_Valid is TRUE.

PhyLnkDiffTS_CNU
TYPE: 14-bit integer
In the CLT the value of PhyLnkDiffTS is calculated only for timestamps received from the

CNUs whose CNU_ID matches the value of PhyDiffITS_CNU. This variable exists only in the CLT.

PhyLnkDiffTS_Valid
TYPE: Boolean
In the CLT the value of PhyLnkDiffTS is only valid when this variable is TRUE. The PhyLnkDiffTS_Valid variable is set to FALSE by any write to PhyLnkDiffTS_CNU.

Response
Response Status: C
ACCEPT IN PRINCIPLE.
For CNU to Capture feature only.

Proposed Response
Response Status: Z
REJECT.

This comment was WITHDRAWN by the commenter.

See Cmt # 3448 (topic "magenta")
Rev - meaning of {Cross references for "100", "101", "102", and "103"} not at all clear to this Ed.

SuggestedRemedy

Make sure all external cross references in this clause have a character tag of "External".

Response
Response Status: C
ACCEPT IN PRINCIPLE.
This applies to all clauses. Editors need to do a sanity check.
The changed position of the PMD_SIGNAL_request() to be just before the IDFT does not give sufficient lead time for conventional RF power amplifier turn on times. Need to accommodate up to 100 us of turn on time. Moving signal generation back to the data detector satisfies this lead in timing.

1) Update Figure 100-3 to move PMD_SIGNAL.request() back up to be an output of the Data Detector.
2) Page 85, Line 33, change "PMA" to "PCS data detector".
3) CL 101.4.3.8.2, Page 201, Line 46 to 54, remove text and remove editor's note.
4) CL 101.3.3.5.7, Page 142, Line 19. Insert this paragraph at the end of the transferToPMA description, as part of the description: "CNU only operation: upon initialization of the CNU, the PMD_SIGNAL.request(tx_enable) primitive is set to the value OFF. When burstStart is TRUE, the CNU sets the PMD_SIGNAL.request(tx_enable) primitive to the value OFF, instructing the PMD sublayer to start the process of turning the RF power amplifier on (see Figure 100-3 and 100.2.9.7). When burstEnd is TRUE, the CNU sets the PMD_SIGNAL.request(tx_enable) primitive to the value OFF, instructing the PMD sublayer to start the process of turning the RF power amplifier off."
5) Clause 100, 100.2.9, Page 106, Line 16, Add new subclause "100.2.9.8 CNU RF power amplifier time reporting requirements" as per laubach_3bn_1X_0515.pdf and process the other editing directives.
6) Clause 103, 103.3.2.4, Page 295 Line 42. Replace "The CLT shall not grant less than TQB time_quanta into the future, in order to allow the CNU processing time when it receives a gate message. The CNU shall process all messages in less than this period. The CLT shall not issue more than one message every TQB time_quanta to a single CNU." with "The CLT shall not issue more than one message every 1024 time_quanta to a single CNU. The CNU shall process all messages in less than this period. The CLT shall not issue a gate message more than 1024 time_quanta into the future. The unit of time_quanta is defined in 77.2.2.1."
Cl 00 SC 30.5.1.1.2 P 432 L 10 # 3577

Comment Type: T  Comment Status: A
Laubach, Mark  Broadcom

Page/line references to P802.3bx Section 2, Clause 30, Draft 3.0.

Page 432, Line 10:
Create editors directive to update aMAUType. Please the following line in alphanumeric order after "10GBASE-PR-U4", underlined:

"10GPASS-XR<tab>Coax cable distribution network PCS/PMA up to 10GBd continuous downstream / burst mode upstream as specified in Clause 101"

Suggested Remedy
As per comment.

Response
ACCEPT IN PRINCIPLE.

Cl 100 SC 100 P 75 L 29 # 3493

Comment Type: ER  Comment Status: A
Laubach, Mark  Broadcom

Put this above the heading for Clause 100 on the next page as per the template.

Suggested Remedy
As per comment.

Response
ACCEPT.

Cl 01 SC n/a P 23 L 3 # 3851

Comment Type: E  Comment Status: A
Remein, Duane  Huawei

Change per remein_3bn_12_0515.pdf
(on behalf of P Anslow, see anslow_3bn_01_0515.pdf)

Suggested Remedy
As commented

Response
ACCEPT.

Cl 100 SC 100.1 P 76 L 1 # 3495

Comment Type: ER  Comment Status: A
Laubach, Mark  Broadcom

In clause title, lower case words to meet guidelines: "Physical Medium Dependent (PMD) sublayer, and medium for coaxial distribution networks, type 10GPASS-XR"

Suggested Remedy
As commented

Response
ACCEPT.
IEEE 802.3bn EPON Protocol over Coax (EPOC) TF 4th Task Force review comments

Final Responses

CL 100 SC 100.1 P 76 L 6 # 3496
Laubach, Mark

Comment Type T Comment Status A

Line 6: Insert "the" to make: "describes the Physical"
Line 7: Change "PHY" to "PHYs"
Line 8: Delete ", relative to the MAC/PLS service interface"
Lines 35 and 38: Add comma "direction, respectively"

Suggested Remedy
as commented.

Response Response Status C
ACCEPT.

CL 100 SC 100.1 P 78 L 8 # 3562
Kliger, Avi

Comment Type TR Comment Status A

There is no support for 10 Gbps in the upstream in these specifications. 1.8 Gbps can be supported as indicated in section 56 and 1.6 Gb/s somewhere else

Suggested Remedy
Change text accordingly

Response Response Status C
ACCEPT.

CL 100 SC 100.1.4 P 82 L 7 # 5499
Laubach, Mark

Comment Type ER Comment Status A

Line 7: insert command to make "rates, respectively"
Line 19: "Phy" to "PHY"
In Table 100-1:
Line 53: "Upper" to "upper"
Page 83
Line 18: remove blank row
Lines 20 to end of table: change all "Type" to "type" in first column of each row.
Page 84
Lines 16 through 24: Change "RxMER" to "receive MER" in first two columns of each row where present.

Suggested Remedy
As per comment.

Response Response Status C
ACCEPT.

CL 100 SC 100.1.5 P 82 L 33 # 5413
Remain, Duane

Comment Type T Comment Status A

CLT_TxMute (as in Cl 45 & 100.3.4) or just TxMute?

Suggested Remedy
Change Entry in Table 100-1 to CLT_TxMute.

Response Response Status C
ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Page 8 of 63
5/20/2015 10:31:44 AM
Comment Type TR Comment Status A
Table 100-1 does not support modulation type (bit loading) profiles for 5 DS channels

SuggestedRemedy
Add entries for modulation types for all channels or a channel indicator

Response Response Status C
ACCEPT IN PRINCIPLE.
Remove Ed Note pg 158 ln 12

To 101.4.1.1 OFDM Profile descriptors add to the end of the section:
"To update the entire downstream profile in an EPoC network that includes all five downstream OFDM channels the CLT first sets the DS_OFDM_ID variable to one then updates the changed DS_ModTypeSC ()s for the 1st OFDM channel. The CLT then proceeds to update the 2nd OFDM channel by changing DS_OFDM_ID to two followed by any updates to the DS_ModTypeSC ()s for the 2nd channel. This continues until all five OFDM channels have been updated. The final action the CLT takes is to update the DS_CID (see 102.2.3.1.1) to switch from the current active profile to the profile copy that was just updated by the above actions. The above description is an example only; the CLT need not update the downstream profile in its' entirety nor in any particular order before the DS_CID switch.

Comment Type ER Comment Status A
"symbol" is usedd in various places to describe a resource elements, and is also used in conjunction with OFDM symbol.
In oteher places modulation symbol or I/Q value pair are used

SuggestedRemedy
Replace symbol with modulated symbol or I/Q value pair where applicable

Response Response Status C
ACCEPT IN PRINCIPLE.
Line 8: replace "symbol" with "modulated symbol"

Comment Type T Comment Status A
Line 4: char tag External on cross ref
Lines 8 thorough 46, add cross references to all Clause 100 and 101 mentions.
Line 40, "Clause 101" should be "Clause 100".
Line 46, remove "TBD": this was an accidental typo leftover from last round edits.

SuggestedRemedy
As per comment

Response Response Status C
ACCEPT.

Comment Type ER Comment Status A
"symbol" is usedd in various places to describe a resource elements, and is also used in conjunction with OFDM symbol.
In oteher places modulation symbol or I/Q value pair are used

SuggestedRemedy
Replace symbol with modulated symbol or I/Q value pair where applicable

Response Response Status C
ACCEPT IN PRINCIPLE.
Note: Subclause 100.2.1.1 is on Delay constraints and is not the target of this comment.
Line 8: replace "symbol" with "modulated symbol"

Comment Type T Comment Status A
Disregard earlier comment to only remove the Editor's note without creating a variable.
Delete editors note. Create variable name: "Target Receive Power".
type signed integer "This is the configured target receive power for the CLT upstream receiver, represented in 0.1 dB steps. See Table 100-12." Value: 0 (default). Editors to add to appropriate clause tables and clause 45 as needed.

SuggestedRemedy
As per comment.

Response Response Status C
ACCEPT IN PRINCIPLE.
Per comment and
Remove Ed Note pg 107 In 24.
Comment Type: ER  Comment Status: A

1) Change "Upstream" to "upstream"
2) Line 32, Cross reference should be to Table 100-12. Update it.

Suggested Remedy
As per comment.
Response: Response Status: C
ACCEPT.

---

Comment Type: ER  Comment Status: A

Line 30: ",," to ""
Lines 45-53: remove trailing ",0" form numbers in second column.

Suggested Remedy
As per comment.
Response: Response Status: C
ACCEPT.

---

Comment Type: ER  Comment Status: A

Table 100-14: Set the Orphan Rows for this table to a more reasonable value (3)
Page 109:
Lines 12 and 13 Lower case of second, and second and third parameter words
Line 12 "ohms" to omega symbol
Lines 15 and 17, "-" to "to"

Suggested Remedy
As per comment.
Response: Response Status: C
ACCEPT.
<table>
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<th>SC 100.2.12.3.1</th>
<th>P 11</th>
<th>L 54</th>
<th># 3581</th>
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<td>Laubach, Mark</td>
<td>Broadcom</td>
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<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td>Rev</td>
</tr>
<tr>
<td>Insert new subclause on Channel Band Plan as contained in laubach_3bn_14.0515.pdf (and docx). Note that this addition includes adding a normative reference Clause 1.3.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Suggested Remedy</td>
<td>As per comment.</td>
<td></td>
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<td>Response</td>
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</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
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</tr>
<tr>
<td>Remove two &quot;shall&quot;s in ref to Eq 101-18.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
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<th>SC 100.2.4</th>
<th>P 85</th>
<th>L 34</th>
<th># 3532</th>
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<tr>
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<td>Broadcom</td>
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<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Line 33 and 34: Change: &quot;In the upstream direction, this primitive is generated by the Clause 101 PMA to turn on and off the transmitter according to the presence of non-null data presented to the IDFT.&quot; to: &quot;In the upstream direction, this primitive is generated by the Clause 101 PCS to turn on and off the RF power amplifier in the Clause 100 PMD (see 100.2.9.x).&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>As per comment.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Response</td>
<td>Response Status</td>
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<tr>
<td>ACCEPT.</td>
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</table>

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<th>SC 100.2.5</th>
<th>P 86</th>
<th>L 41</th>
<th># 3540</th>
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<td>Kliger, Avi</td>
<td>Broadcom</td>
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<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>A</td>
<td>Rev</td>
</tr>
<tr>
<td>Table 100-2 includes Optional modulation formats. Are these optional at the transmitter, receiver or both? Is there a corresponding capability register?</td>
<td></td>
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</tr>
<tr>
<td>Suggested Remedy</td>
<td>Specify where optional. If optional in the transmitter a capability register is required.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT.</td>
<td></td>
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</tr>
</tbody>
</table>

For line 44: discuss with TF on changing NA to NS everywhere or changing "supported" to something else or simply removing ",, NA = not supported" for other items, as per comment.

<table>
<thead>
<tr>
<th>Cl 100</th>
<th>SC 100.2.5</th>
<th>P 86</th>
<th>L 39</th>
<th># 3479</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laubach, Mark</td>
<td>Broadcom</td>
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<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Table 100-2 change &quot;O&quot;s to &quot;NA&quot;s for upstream 8K and 16K QAM entries. These optional rates are meant for DS only, not US.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Suggested Remedy</td>
<td>As per comment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Response Status</td>
<td>C</td>
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<td>ACCEPT.</td>
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<td>Comment Type</td>
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<td>Comment Status</td>
<td>A</td>
<td>P</td>
</tr>
</tbody>
</table>

8192-QAM and 16384-QAM are not applicable for the upstream.

SuggestedRemedy
Correct table 100-2 accordingly.

Response
ACCEPT.

Already done in comment #3479.

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>T</th>
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<td>R</td>
<td>P</td>
<td>L</td>
<td>#</td>
</tr>
</tbody>
</table>

"data rate of at least 1.6 Gb/s". This is different than the data rate required in section 56 (1.8 Gbps).

SuggestedRemedy
Align the two specs.

Response
ACCEPT IN PRINCIPLE.

Use same TF resolution as for comment #3562.

<table>
<thead>
<tr>
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<th>P</th>
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<td>Comment Status</td>
<td>R</td>
<td>P</td>
<td>L</td>
<td>#</td>
</tr>
</tbody>
</table>

Equation 100-2 doesn't take the FEC overhead into account.

SuggestedRemedy
Multiply by the max US FEC Rate.

Response
REJECT.

PCS overheads are not included in this calculation. This is the PMA raw data rate, see laubach_3bn_15_0194.xls.

<table>
<thead>
<tr>
<th>Comment Type</th>
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<th>R</th>
<th>P</th>
<th>L</th>
<th>#</th>
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</thead>
<tbody>
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<td>Comment Status</td>
<td>R</td>
<td>P</td>
<td>L</td>
<td>#</td>
</tr>
</tbody>
</table>

Equation 100-1 doesn't take the FEC overhead into account.

SuggestedRemedy
Multiply by the max DS FEC Rate.

Response
REJECT.

PCS overheads are not included in this calculation. This is the PMA raw data rate, see laubach_3bn_15_0194.xls.
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

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

DS_DataRate & DS_DataRate have no defined data type (although they are well defined).

**SuggestedRemedy**

Add new section 100.2.6.3 Variables

DS_DataRate
TYPE: UQ34.3 format
This variable indicates the downstream data rate in units of bps and is calculated as shown in Equation 100-1.

US_DataRate
TYPE: UQ34.3 format
This variable indicates the upstream data rate in units of bps and is calculated as shown in Equation 100-2.

Update reference in Cl 45.2.1.147 & 45.2.1.148 pg 50 ln 7 & 37

This comment should be changed to clause 00 after a proposed response is made.

**Response** ACCEPT.

---

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

Line 41 and 48: change first "is" to "are"

**SuggestedRemedy**
as per comment.

**Response** ACCEPT.

---

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

US_FreqCh1 is not formally defined. This seems to be a logical place.

**SuggestedRemedy**

In 100.2.7.3 Variables Add

US_FreqCh1
TYPE: 16-bit unsigned integer
This variable specifies the center frequency, in steps of 50 kHz, of subcarrier 0 for the upstream OFDM channel. Subcarriers are numbered from 0 to 4095 with subcarrier 0 at the lowest frequency. This definition equates to a subcarrier 0 center frequency of from 5 MHz to 3.27675 GHz. The minimum value for this register is 100. See Table 100-11 for additional details.

Note currently there is no table for CNU RF output requirements but Table 100-11 seems to be similar

Update ref in 45.2.1.135.1 pg 43 ln 27 to 100.2.7.3

Note this comment is written against Cl 100 but should be changed to Cl 00 after a proposed response has been made.

**Response** ACCEPT.
54 MHz is in the upstream frequency range

**Suggested Remedy**

54 MHz to 258 MHz

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

The integer range of this variable is larger than the DS requirements of 258 to 1218 MHz on both the low side and the high side. Does the TF wish to narrow the range of this variable or leave as is?

---

"with a minimum of 24 MHz," from the sentence as this is already specified in Table 100-3 as a requirement.

**Suggested Remedy**

As per comment.

**Response**

**Response Status**: C

ACCEPT.

---

Create a variable per downstream channel for OFDM channel power. Editor can pick the variable name. Type: unsigned integer. Description: "Downstream OFDM channel power expressed in increments of 0.2 dB. The value is set according to the requirements in Table 100-7."

Editors to add to appropriate clause tables and clause 45 as needed.

**Suggested Remedy**

As per comment.

**Response**

**Response Status**: C

ACCEPT.

---

Line 5: Question on meaning for: "up to <+-> of the subcarrier". Replace "up to <+-> 50 kHz of the subcarriers' center frequencies"

**Suggested Remedy**

As per comment.

**Response**

**Response Status**: C

ACCEPT.

---

Line 26: change "." to Ctrl-q Shift-p
Line 34: lower case letters for every word not starting a sentence and not for "OFDM".
In Table 100-3:
All rows: lower case all but first word in Parameter
Line 52: change "usec" to "us"
Page 91
Line 40: use omega symbol rather than "ohms"

**Suggested Remedy**

As per comment.

**Response**

**Response Status**: C

ACCEPT.
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment Description</th>
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<tbody>
<tr>
<td>T</td>
<td>A</td>
<td>A transcription error was made in the N* equation. In side the minimum function, change ceiling(Neqport/4) to ceiling(Neqport/4) (i.e., drop the apostrophe).</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>As per comment.</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>Line 23: fix &quot;two rows above&quot; as there is only one row above</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>Line 36: add apostrophe to &quot;channels&quot;. From Peter: is this intended to be possessive? if so it should be channels'</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>Line 42: From Peter &quot;These footnotes don't seem applicable to this table which is about power levels and not noise and spurious requirements.&quot;</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>Line 46: &quot;all channel with 999&quot;, wording is broken</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>Eq 100-6 (N*) needs to be formatted with two conditions: something like If Neqport = 1 then N* = {factor1} If Neqport &gt; 1 then N* = {factor2} As it is now it is not clear exactly how N* is calculated.</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>Replace &quot;inactive&quot; with &quot;excluded&quot;</td>
</tr>
<tr>
<td>T</td>
<td>C</td>
<td>To prevent cross-refs splitting across lines: Format, Document, Text Options, delete the middle dash of three, Apply</td>
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<td>The following statement is the only instance of the term inactive subcarrier. The CLT modulator shall satisfy the out-of-band spurious emissions requirements of Table 100-6 in gap spectrum between OFDM channels of at least 6 MHz and within exclusion bands within OFDM channels of at least 8 MHz, except for the 1 MHz of inactive subcarriers on each edge of any exclusion band, with relaxations as described in the following paragraphs when applicable. As such is may be confusing.</td>
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IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Draft 1.4

Final Responses

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<td>#3460</td>
<td>Laubach, Mark Broadcom</td>
<td><strong>Comment Type</strong> T <strong>Comment Status</strong> A</td>
</tr>
<tr>
<td>Comment</td>
<td>&quot;wedged&quot; is not a technical term. Replace word with &quot;positioned&quot;</td>
<td></td>
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</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
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<td>Laubach, Mark Broadcom</td>
<td><strong>Comment Type</strong> T <strong>Comment Status</strong> A</td>
</tr>
<tr>
<td>Comment</td>
<td>Line 30: lower case &quot;Measured&quot; Line 41: comma before &quot;respectively&quot; Line 50: Peter: what equation? This note is applied to the &quot;Requirement (in dBc)&quot; heading. There are no equations producing values in 0.5 dB steps in this column. Mark: this footnote used to point to EQ 100-6 that was embedded in the table, since we moved the eq out separately, this footnote can be removed if it is not longer needed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>As per comment.</td>
<td></td>
<td></td>
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<tr>
<td>Cl 100 SC 100.2.8.7 P 97 L 10</td>
<td>#3462</td>
<td>Remein, Duane Huawei</td>
<td><strong>Comment Type</strong> T <strong>Comment Status</strong> A</td>
</tr>
<tr>
<td>Comment</td>
<td>The definition of variable DS_ChCnt can be better placed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>Move the definition to new section 100.2.6.3 Variables Remove section 100.2.8.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line 30: lower case &quot;Measured&quot; Line 41: comma before &quot;respectively&quot; Line 50: Peter: what equation? This note is applied to the &quot;Requirement (in dBc)&quot; heading.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>As per comment for line 48. For line 10, queried CE for input.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td></td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>
**Comment Type** ER Comment Status A
Change cross reference from Table-11 to Table-12

**Suggested Remedy**
As per comment.

**Response** Response Status C
ACCEPT.

---

**Comment Type** ER Comment Status A
Change dash to Ctrl-q Shft-p

**Suggested Remedy**
As per comment.

**Response** Response Status C
ACCEPT.

---

**Comment Type** TR Comment Status A Rev
Replace table 100-7 as per laubach_3bn_10_0515.pdf. This removes the TBD. Editors Note on Line 33 no longer needed, delete.

**Suggested Remedy**
As per comment.

**Response** Response Status C
ACCEPT IN PRINCIPLE.
Replace CM with CNU.

---

**Comment Type** ER Comment Status A
Line 45: "2.0" to "2"
Line 54: lower case "Specification" and "Interval"

**Suggested Remedy**
As per comment.

**Response** Response Status C
ACCEPT IN PRINCIPLE.
"lower case"

---

**Comment Type** ER Comment Status A
Line 18, 29, 30, and 45: dash to Ctrl-q Shft-p
Line 22: Esc n s
Line 53: change "." to ".

**Suggested Remedy**
As per comment.

**Response** Response Status C
ACCEPT.

---

**Comment Type** E Comment Status A
Fix variable name so that it doesn't hypenate.

**Suggested Remedy**
As per comment.

**Response** Response Status C
ACCEPT.

---

**TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

**COMMENT STATUS:** D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  Z/withdrawn

**SOR T ORDER:** Clause, Subclause, page, line

---

**CI 100 SC 100.2.9.1 P 106 L 33 # 3583**
Laubach, Mark
Broadcom

**CI 100 SC 100.2.9.3 P 98 L 25 # 3463**
Laubach, Mark
Broadcom

**CI 100 SC 100.2.9.5.1 P 100 L 30 # 3476**
Laubach, Mark
Broadcom

**CI 100 SC 100.2.9.5.1 P 100 L 45 # 3465**
Laubach, Mark
Broadcom

**CI 100 SC 100.2.9.5.1 P 99 L 18 # 3464**
Laubach, Mark
Broadcom

**CI 100 SC 100.2.9.5.1 P 99 L 22 # 3475**
Laubach, Mark
Broadcom

---

**Draft 1.4** IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

**Final Responses**

---

5/20/2015 10:31:44 AM
Laubach, Mark

Comment Type: ER  Comment Status: A

Comment:
Line 3, 37: asterisk to fn multiply
Line 46: insert nonbreaking space in "400 kHz" to avoid line separation.

Suggested Remedy:
As per comment.

Response
Response Status: C
ACCEPT.

Laubach, Mark

Comment Type: T  Comment Status: A

Comment:
This paragraph is a duplicate shall for the paragraph on in CL 100.2.9.5.2 Page 101, Line 50 with the exception of the parenthetical phrase. This will confuse the PICS with duplicate shalls.

Suggested Remedy:
Remove the paragraph on page 102 at line 41.

Response
Response Status: C
ACCEPT.

Laubach, Mark

Comment Type: ER  Comment Status: A

Comment:
In Table 100-9 all dashes to Ctrl-q Shift-p

Suggested Remedy:
As per comment.

Response
Response Status: C
ACCEPT.

Laubach, Mark

Comment Type: T  Comment Status: A

Comment:
1) Change "ramp-up" to "RF power amplifier turn on" and "ramp-down" to "turn off".
2) Add a "see 100.x.x.x" cross reference at end of the sentence pointing to the subclause IFF the power amplifier turn on and turn off time text proposal gets accepted.
3) Line 39, add missing period at end of sentence.

Suggested Remedy:
As per comment.

Response
Response Status: C
ACCEPT.

Laubach, Mark

Comment Type: T  Comment Status: A

Comment:
How is "j" used in the equation?
Line 35, add a comma at end after "1"

Suggested Remedy:
Add a sentence to the "where:" list for eq 100-19:
"j is the jth subcarrier in the burst." italicize each "j".

Line 35: add the comma at the end.

Response
Response Status: C
ACCEPT.

Remein, Duane

Comment Type: E  Comment Status: A

Comment:
Change title of Table 100-11 from "CNU transmitter output signal characteristics" to "CNU RF output requirements" (to match the complementary CLT RF output requirements table 100-3)

Suggested Remedy:
per comment

Response
Response Status: C
ACCEPT.
Cl 100 SC 100.2.9.7 P 105 L 31 # 3474
Laubach, Mark Broadcom

Comment Type T Comment Status A
Table 100-11 title should match CLT transmitter table header text.

Change "CNU transmitter output signal characteristics" to "CNU RF output requirements"

Suggested Remedy
As per comment.

Response Response Status C ACCEPT.
See comment #3380

Cl 100 SC 100.2.9.7 P 106 L 8 # 3469
Laubach, Mark Broadcom

Comment Type ER Comment Status A
Line 8 to 12: lower case all but first Parameter word in first column.
Line 10: ohms to omega symbol.
Line 24: add ctrl space to "6.4 MHz"
Lines 39 to 46: in second column all dashes to Ctrl-q Shift-p

Suggested Remedy
As per comment.

Response Response Status C ACCEPT.

Cl 100 SC 100.3 P 78 L 14 # 3571
Laubach, Mark Broadcom

Comment Type T Comment Status A
Remove "Data Detector" from FEC Encoder box in Figure 100-2.
Page 79, Line 13: Add "Data Detector" to box FEC Encode in Figure 100-3.

Suggested Remedy
As per comment.

Response Response Status C ACCEPT.
The sentence "When operating in one-CW-per-channel test mode the CLT shall be capable of generating the CW tone over the full range of Center Frequency in Table 100-16," essentially duplicates the "shall" on Line 1. Suggest deleting this second sentence from Line 25 to end of paragraph. Having these two similar "shall"s confused the PICS.

Also on line 2, change "the CW" to "a CW" or "any CW".

**Suggested Remedy**
As per comment and TF selection.

**Response**

**Laubach, Mark**
Broadcom

**Response Status**

**C**

**ACCEPT.**

---

Move "In addition, the CLT shall be configurable in either one or both of the following conditions: "] out of the first sub-bullet and place at the end of the preceding paragraph.

**Suggested Remedy**
As per comment.

**Response**

**Laubach, Mark**
Broadcom

**Response Status**

**C**

**ACCEPT.**

---

Move this text to the end of 100.3.1, remove 100.3.4 subclause header. There is a subclause for this material already. Update PICS.

**Suggested Remedy**
As per comment.

**Response**

**Laubach, Mark**
Broadcom

**Response Status**

**C**

**ACCEPT.**

---
### IEEE 802.3bn EPON Protocol over Coax (EPOC) TF 4th Task Force review comments

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100.7</td>
<td>115</td>
<td>31</td>
<td>3582</td>
<td>Add PICS subclauses to 100.7 as per laubach_3bn_15_0515.pdf (and fm).</td>
<td>As per comment.</td>
<td>Accept in principle.</td>
<td></td>
</tr>
<tr>
<td>110.3.1</td>
<td>112</td>
<td>14</td>
<td>3586</td>
<td>Change cross reference &quot;Table 100-2&quot; to &quot;Table 100-3&quot;.</td>
<td>As per comment.</td>
<td>Accept.</td>
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<tr>
<td>100A</td>
<td>100A.1</td>
<td>343</td>
<td>33</td>
<td>3519</td>
<td>From Peter: &quot;meters is a lower case m and there should be a space between a number and its unit.&quot; Change &quot;50M&quot; to &quot;50 m&quot; and &quot;2M&quot; to &quot;2 m&quot;</td>
<td>As per comment.</td>
<td>Accept.</td>
<td></td>
</tr>
<tr>
<td>100A</td>
<td>100A.1.3</td>
<td>347</td>
<td>24</td>
<td>3478</td>
<td>For creating Draft 1.4, a comparison was done between Table 100A-2 and the channel model spreadsheet in baseline_channel_model_3bn_01_0413.xlsx, worksheet &quot;US Baseline&quot;. The value of &quot;54&quot; was incorrect as noticed in D1.3 and changed to &quot;-50&quot; to match the spreadsheet value. An editors note was added to make sure this technical value change is approved by TF in this comment resolution. If the TF approves this comment, leave as &quot;-50&quot; and remove the editors note. If the TF wants the old value of &quot;54&quot; returned, then change the table cell text back to &quot;54&quot; and remove the editors note.</td>
<td>As per comment.</td>
<td>Accept.</td>
<td></td>
</tr>
</tbody>
</table>
Comment Type: T

Comment Status: A

Some DOCSIS or other jargon remains in the table notes.

Question on NOTE 6: assuming CM is cable modem, and needs to change to CNU, what does the "97% criteria" specifically refer to in this statement?

Suggested Remedy:

Line 18/19: NOTE 2, change "MSO" to "cable operator"
Line 23/24: NOTE 5, change "U/S" to "US"
Line 24/25: NOTE 6, change "Upstream CM" to "upstream CNU".

Response Status: C

ACCEPT IN PRINCIPLE.
Still need clarification on "97% criteria".

Comment Type: ER

Comment Status: A

Table 100A-1:
Line 5: "1.0" to "1", add non breaking space also.
Line 9: dash to space Ctrl-q Shift-p
Line 22: 54 to 1000 (Style manual)
Line 26 and elsewhre in able: dashes to Ctrl-q Shift-p
Lines 37 through 42: all "nsec" to "ns"
In table, fix dashes and usescs as per remedies in other Page 346:
Lines 12 and 17: dash to Ctrl-q Shift-p
Line 26, font issue with "Echo mask..."
Line 27x "-" to " to "

Suggested Remedy:
As per comment.

Response Status: C

ACCEPT.

Comment Type: T

Comment Status: A

Remove TBD from "nominal conditions" column.

Suggested Remedy:
As per comment.

Response Status: C

ACCEPT IN PRINCIPLE.
Per comment and
Change:
"Other Bands (New upstream spectrum)"
to:
"Other Bands (42 MHz to upstream band edge)"

In all Cl 100A tables change
"effected subcarriers"
to
"affected subcarriers"
### Comment 3574

**Comment Type:** T  
**Comment Status:** A  
**Line 29:** Change "(Non-white characteristics" and ")" to "Bandwidth", Change "TBD" to "Occupied spectrum". Leave table note 5 remaining.  
**Suggested Remedy:**  
As per comment.  
**Response:**  
ACCEPT.

### Comment 3597

**Comment Type:** T  
**Comment Status:** A  
**Ability registers missing:**  
- Optional DS Modulation Types  
- Optional US Modulation Types  
- Number of Supported DS OFDM Channels  
  
Consider changing the "O" in Table 100-2 for 8-QAM PHY Link CNU Tx/CLT Rx to either M or NA  
**Suggested Remedy:**  
See remein_3bn_03_0515.pdf  
**Response:**  
ACCEPT IN PRINCIPLE. Per comment and Change from Cl 100.2.5 to 101.4.2.3 pg 160 In 47 Remove 8K & 16K from US_ModAbility

### Comment 3351

**Comment Type:** E  
**Comment Status:** A  
**EDITORS NOTE (to be removed prior to publication): we should specify a minimum precision for this number.**  
Range is ~28.3 a U5.2 should be sufficient. (calc to right) However PHY_xS_Rate has 3 bits of significance so maybe using 3 sig bits for consistency would be good? So use U5.3.  
**Suggested Remedy:**  
Change:  
"TYPE: real number"  
to:  
"TYPE: U5.3 format"  
**Response:**  
ACCEPT IN PRINCIPLE. Remove Ed Note

### Comment 3435

**Comment Type:** T  
**Comment Status:** A  
**EDITORS NOTE (to be removed prior to publication):** we should specify a minimum precision for this number. **Range is ~28.3 a U5.2 should be sufficient. (calc to right) However PHY_xS_Rate has 3 bits of significance so maybe using 3 sig bits for consistency would be good? So use U5.3.**  
**Suggested Remedy:**  
Change:  
"TYPE: real number"  
to:  
"TYPE: U5.3 format"  
**Response:**  
ACCEPT IN PRINCIPLE. Remove Ed Note
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Comment Type: T  Comment Status: A  Ed/TBD

EDITORS NOTE (to be removed prior to publication): we should specify a minimum precision for this number.
Use Ux.3 for consistency with UD/DS Rate.
Same comment against Pg 125 in 45 (PHY_OSizeFrac TYPE).

Suggested Remedy
Pg 124 In 54 Change:
"TYPE: real number"
"TYPE: U1.3 format"
Remove Ed Note

Pg 125 In 45 Change:
"TYPE: real number"
"TYPE: U0.3 format"
Remove Ed Note pg 126 In 1

Response  Response Status: C
ACCEPT.

Comment Type: T  Comment Status: A  Ed/TBD

Clear non-controversial TBDs in Clause 101

Suggested Remedy
pg In Replace with
125 29 UQ34.3 format fractional number [matches DS data rate precision]
194 36 Table 101-TBD -> Table 101-7
194 46 Table 101-TBD -> Table 101-7
195 11 Table 101-TBD -> Table 101-7
196 6 101.4.2.7
196 14 101.4.2.7

Response  Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A  Ed/TBD

Remove the following Editors Notes:
Pg Ln
126 44
126 51
129 41
208 18

Suggested Remedy
Per comment

Response  Response Status: C
ACCEPT.
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<tr>
<th>Cl 101</th>
<th>SC 101.3.2.1.3</th>
<th>P 126</th>
<th>L 11</th>
<th># 3377</th>
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<td><strong>Ed Note has served it's purpose.</strong></td>
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<td><strong>&quot;EDITORS NOTE (to be remove prior to publication): Note that the list of variables will be updated per technical decision #45 (<a href="http://www.ieee802.org/3/bn/public/decisions/decisions.html">http://www.ieee802.org/3/bn/public/decisions/decisions.html</a>) once EPoC-specific FEC and PMD overhead details are settled.&quot;</strong></td>
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<td>Remove Ed Note.</td>
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<tr>
<td><strong>Fig 101-3 &amp; 4 Rev</strong></td>
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</tr>
<tr>
<td>Redraw figures 101-3 &amp; 101-4 so symbols display correctly.</td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
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<td>Replace with native FrameMaker figures as illustrated in remain_3bn_19_0515.pdf</td>
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<tr>
<td><strong>Figure 101-4 does not imply an &quot;order shown&quot; as specified in the following statement:</strong></td>
<td></td>
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<tr>
<td>&quot;The CLT PCS shall perform the Idle deletion process as shown in Figure 101-2. The CNU PCS shall perform the Idle deletion process as shown in Figure 101-3 (data rate adaptation sub-process) Figure 101-3 and in (FEC overhead compensation sub-process), in the order shown in Figure 101-4.&quot;</td>
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<td><strong>Suggested Remedy</strong></td>
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<tr>
<td>Change to read:</td>
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<tr>
<td>The CNU PCS shall perform the Idle deletion process as shown in Figure 101-3 (data rate adaptation sub-process) and in Figure 101-4 (FEC overhead compensation sub-process).</td>
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<td><strong>Response</strong></td>
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<tr>
<td><strong>ACCEPT.</strong></td>
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<th>SC 101.3.2.1.5</th>
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<tr>
<td><strong>Fig 101-3 &amp; 4</strong></td>
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<tr>
<td>Figure 101-3 symbols did not translate from viseo well (came out as dots). Similar issue with Figure 101-4 pg 129</td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
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<tr>
<td>Convert to native framemaker or if not time for that convert to EMF format.</td>
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<td><strong>Response Status</strong></td>
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<td><strong>ACCEPT IN PRINCIPLE.</strong></td>
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<tr>
<td>See Cmt #3389 (topic Fig 101-3 &amp; 4)</td>
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<th>L 52</th>
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<td><strong>Comment Status</strong></td>
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<tr>
<td><strong>This statement describes the output of the encoder not the input.</strong></td>
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<tr>
<td>&quot;The EPoC 64B/66B encoder does not include a scrambler function as described in 49.2.6 and the input is a 65B block with a single synch header bit.&quot;</td>
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<tr>
<td><strong>Suggested Remedy</strong></td>
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<tr>
<td>Change &quot;input&quot; to &quot;output&quot;</td>
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<tr>
<td><strong>Response</strong></td>
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<tr>
<td><strong>Response Status</strong></td>
<td>C</td>
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<tr>
<td><strong>ACCEPT.</strong></td>
<td></td>
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</tr>
</tbody>
</table>
Comment Type: E  Comment Status: A
Wording:
"The CLT 10GPASS-XR PCS operating on CCDN shall encode the transmitted data using
one of the LDPC (16200, 14400) code per Table 101-2."
Suggested Remedy
to:
"The CLT 10GPASS-XR PCS operating on CCDN shall encode the transmitted data using
the LDPC (16200, 14400) code per Table 101-2."
Response:  Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A
"FEC encode" should be "FEC Encoder" in 4 places:
Pg line
134 3
134 31
144 37
145 46
"data detector" should be "Data Detector" in 3 places
125 20
144 37
146 46
Suggested Remedy
Per comment
Response:  Response Status: C
ACCEPT.
Also see Cmt# 3441 regarding FEC Encoder

Comment Type: T  Comment Status: A
Now that we know positively what "any additional FEC-related overhead" is we can be
more precise in this statement:
Suggested Remedy
Change:
"insertion of the FEC parity data as well as any additional FEC-related overhead"
to:
"insertion of the FEC parity data and CRC40"
Response:  Response Status: C
ACCEPT.

Comment Type: TR  Comment Status: A
Figure 101-7 is not updated
Suggested Remedy
Correct the burst structure in the figure accordinglu
Response:  Response Status: C
ACCEPT IN PRINCIPLE.
See Cmt# 3375
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<td>101.3.2.5.3</td>
<td>136</td>
<td>26</td>
<td>3375</td>
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<td>Remain, Duane</td>
<td>Huawei</td>
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<td><strong>Comment Status</strong></td>
<td><strong>Fig</strong></td>
<td><strong>Rev</strong></td>
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<td>T</td>
<td>A</td>
<td>101-7</td>
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<td><strong>EDITORS NOTE (to be removed prior to publication):</strong></td>
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<tr>
<td>this figure will need to be updated if burst marker structure is changed.</td>
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<td><strong>Suggested Remedy</strong></td>
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<tr>
<td>Replace figure with that in remain_3bn_17_0515.pdf</td>
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<tr>
<td>Pg 187 In 34 change</td>
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<tr>
<td>&quot;An OFDMA transmission shall start with a Type 2 resource block followed by four contiguous subcarriers which include the start burst marker (see 101.4.3.9).&quot;</td>
<td></td>
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<td></td>
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<tr>
<td>to:</td>
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<tr>
<td>&quot;An OFDMA transmission shall start with four contiguous subcarriers which include the start burst marker (see 101.4.3.9).&quot;</td>
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<td>Pg 187 In 49 change:</td>
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<tr>
<td>&quot;An OFDMA transmission shall end with a Type 2 resource block preceded by four contiguous subcarriers which include the stop burst marker (see 101.4.3.9).&quot;</td>
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<tr>
<td>to:</td>
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<tr>
<td>&quot;An OFDMA transmission shall end with four contiguous subcarriers which include the stop burst marker (see 101.4.3.9).&quot;</td>
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<td><strong>Response</strong></td>
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<tr>
<td><strong>ACCEPT IN PRINCIPLE.</strong></td>
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<tr>
<td>Per comment but change &quot;Burst Marker&quot; label on 3rd idle 64B/66B block at beginning of burst to &quot;Burst Time Header&quot;</td>
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<td>Broadcom</td>
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<td><strong>Figure 101-7, the top part is incorrect. The Type 2's RBs should be removed as the first and last RBs of a burst. First and last are the first and last RBs of the respective marker. Also, the burst markers use all the RB's in the marker and no &quot;holes&quot; are left for data. Belief is that this is already corrected in another comment, this one is here &quot;just in case&quot;.</strong></td>
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<td>See Cmt# 3375</td>
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</table>

**Cl 101 SC 101.3.2.5.8 P 142 L 23 # 3391**
| Remain, Duane | Huawei |
| **Comment Type** | **Comment Status** | **Fig** | **Rev** |
| T | A | | |
| **Incorrect Fig Ref:** |
| "The CLT shall implement the Data Detector output process as depicted in Figure 101-8." |
| **Suggested Remedy** | | | |
| Change to: |
| "The CLT shall implement the Data Detector output process as depicted in Figure 101-9." |
| **Response** | **Response Status** | | |
| | C | | |
| **ACCEPT.** |
| Time permitting Editor authorized to convert the SD to native FrameMaker. | | | |
In 101.3.3.1.1 there is an Ed Note:

EDITORS NOTE (to be removed prior to publication): A figure and reference to same is needed showing FEC decoding process in CLT receiver.

However there is no reason that Figure 101-12 cannot cover both CNU and CLT receive paths.

**SuggestedRemedy**

Change title of Figure 101-12 to "PCS receive path processing"

Add text to the end of the 1st para in 101.3.3.1.2 as follows:

"Note that burstStart and burstEnd indications are passed via the PMA_UNITDATA.indication and are used by the LDPC Decoder in the CLT to determine FEC codeword sizes in any given burst."

**Response**

ACCEPT IN PRINCIPLE.

Remove Ed Note pg 147 ln 31 & 36

---

Replace "decodeFailure ++" with "FecCodeWordFail ++" in DECODE_FAIL state

**SuggestedRemedy**

Per comment.

**Response**

ACCEPT.

---

EDITORS NOTE (to be removed prior to publication): the text in this subclause needs to be updated to account for FEC parity removal and CRC40.

**SuggestedRemedy**

Remove the Ed Note, the text has been updated in previous revisions of the draft.

**Response**

ACCEPT.

---

**SuggestedRemedy**

Move definition to 101.3.3.3.2 Variables

Change definition from

"This constant represents the size of Idle Insertion FIFO buffer. The size of this buffer is selected in such a way that it is able to accommodate the number of 66-bit vectors sufficient to fill the gap introduced by removing the FEC parity data for a maximum size MAC frame, and compensate for the maximum supported difference between the MAC rate and PMD rate."

To:

"This variable represents the size of Idle Insertion FIFO buffer. The size of this buffer is selected in such a way that it is able to accommodate the number of 66-bit vectors sufficient to fill the gap introduced by removing the FEC parity data for a maximum size MAC frame, and compensate for the maximum supported difference between the MAC rate and PMD rate. FIFO_II_SIZE is depended on the line rate the PHY is operating at and may need to be adjusted whenever the profile is changed."

Remove the Ed Notes In 15 & 25

**Response**

ACCEPT IN PRINCIPLE.

depended -> dependent

---

Change "synchronization" to "receive path".

**SuggestedRemedy**

As per comment.

**Response**

ACCEPT.
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Draft 1.4

Final Responses

Cl 101 SC 101.4.2.1 P 160 L 33 # 3556
Kliger, Avi Broadcom

Comment Type T Comment Status A

"The PMA supports five 190 MHz wide OFDM channels; each containing 3800 subcarriers each" - 3800 is the number of active subcarriers

Suggested Remedy

Change sentence as follows:
"The PMA supports five 190 MHz wide OFDM channels; each containing up to 3800 active subcarriers"

Response Response Status C

ACCEPT.

Cl 101 SC 101.4.2.11 P 181 L 9 # 3575
Laubach, Mark Broadcom

Comment Type T Comment Status A

Add to where a line for k: "k is the spectral index of the subcarrier."

After line 16 add:
"The CLT and CNU shall ensure that the encompassed spectrum of a 192 MHz downstream OFDM channel or the upstream OFDMA channel, respectively does not exceed 190 MHz (3800 subcarriers, see Table 100-3 and Table 100-11). These 3800 maximum active subcarriers shall occupy the range 148 <= k <= 3947, where k is the spectral index of the subcarrier in EQ 101-18."

Suggested Remedy

As per comment.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change:
"Where: N equals 4096, X(0) is the lowest frequency component and X(N-1) is the highest frequency component."

To:
"Where:
N equals 4096, X(0) is the lowest frequency component and X(N-1) is the highest frequency component. k is the spectral index of the subcarrier"

After line 16 add:
"The CLT ensures that the encompassed spectrum of a 192 MHz OFDM channel, respectively does not exceed 190 MHz (3800 subcarriers, see Table 100-3 and Table 100-11). These 3800 maximum active subcarriers shall occupy the range 148 <= k <= 3947, where k is the spectral index of the subcarrier in EQ 101-18."

Update PIC with new requirements

In Table 100-11 Change Frequency Band from:
"5 MHz to 204 MHz"
to:
"7.4 MHz to 204 MHz"

Add informative note to the 7.4 which reads:
"7.4 MHz is the center frequency of the first possible active subcarrier per Eq 101-18."

Pg 88 line 48 change:
"5 MHz to 204 MHz"
to:
"7.4 MHz to 204 MHz"

Editors to search draft for any additional instances referencing 5 MHz as the bottom of the US Frequency band.
Pg 43 In 25 change:
"This definition equates to a center frequency from 5 MHz to 3.27675 GHz in 50 kHz steps.
The minimum value for this register is 100.”
to:
"This definition equates to a center frequency from 0 MHz to 3.27675 GHz in 50 kHz steps.”

3454
Cl 101 SC 101.4.2.12.1 P 185 L 7
Remein, Duane Huawei

Comment Type T Comment Status A
DSCn p enum "0 1 0 0 = reserved" doesn’t cover the full range

Also line 23
DSCr p enum two entries for 0 1 1
0 1 1 = 128 samples
0 1 1 = 64 samples
0 0 1 = reserved

Suggested Remedy
Change
0 1 0 0 = reserved
to
x 1 x x = reserved
1 0 x x = reserved

Response A Response Status C
ACCEPT.

REJECT.
This comment was WITHDRAWN by the commenter.
Change to:
"The CLT downstream OFDM symbol and subcarrier frequency and timing relationship is defined in 101.4.2.3."

Functional requirements for the subcarrier clock are given in 101.4.2.3. The relationship between the OFDM symbol clock and output phase noise are given in 101.4.2.2. Each cycle of the downstream subcarrier clock is 4096 cycles of the downstream 204.8 MHz OFDM symbol clock (50 kHz subcarrier spacing). As the 10.24 MHz Master Clock, the 204.8 MHz OFDM clock and the subcarrier clock are all synchronous then it follows that the downstream output waveform is also locked to the 10.24 MHz Master Clock. Furthermore the downstream OFDM symbol clock jitter requirements (which are in the time domain) of Table 101-8 are equivalent to requirements on the downstream subcarrier clock (and its harmonics). The requirements on the OFDM symbol clock are measured using observable parameters in the downstream waveform, which include the downstream subcarrier clock frequency (manifested in the subcarrier spacing) and the downstream subcarrier frequencies.

---

**Comment:**
Jitter requirements in Table 101-8 for frequencies above 1 KHz are excessively loose for OFDM at 200 MHz, and practical transmitters must have orders of magnitude better jitter performance. Phase noise is defined for the frequencies above 1 KHz and is much tighter (100-4)

**Suggested Remedy:**
Propose to delete specifications above 1 KHz in Table 101-8

---

**Comment:**
"Acquisition Time for the CNU" - state specifically that this is the downstream channel (or PLC) acquisition time, that is including PLC proper decoding, being able to receive the downstream PLC and to transmit PHY Discovery responses

**Suggested Remedy:**
should state: "Downstream channel Acquisition Time for the CNU..."

---

**Comment:**
"Downstream channel acquisition time for the CNU ...

---

**Comment:**
"Downstream channel acquisition time for the CNU ...

---

**Response Status:**
ACCEPT IN PRINCIPLE.
"Downstream channel acquisition time for the CNU ...

---

**Response Status:**
ACCEPT.
Several corrections and clarifications are required for this text:

to this text are needed:

1. The relation of K to the subcarrier frequency and relation of L to the cyclic prefix are not explicitly defined. Clarify that the center frequency is a K is an integer related to the subcarrier index and frequency upconversion of the OFDM channel, and L is an integer related to the cyclic prefix.

2. Add clarification that the carrier frequency (center frequency of the N-th subcarrier must be an integer multiple of the subcarrier spacing)

3. Make the equation for the subcarrier clock frequency more intuitive; 20\*Masterclock is the OFDM sampling frequency (204.8 MHz) divided by the number of subcarriers : 4096

Suggested Remedy

Make the following corrections in section 101.4.2.3

1. 2nd bullet:
   *change the equation to:
   subcarrier clock frequency = \( \frac{20}{4096} \times \) Master Clock frequency

2. 4th bullet:
   change text: *Each OFDM symbol has a cyclic prefix which is an integer multiple of 1 / 128th, of the subcarrier clock period

3. 6th bullet:
   change text to the following:
   *The carrier frequency (i.e. the center frequency of the N-th subcarrier) MUST be an integer multiple of the sub-carrier spacing (1)*
   and add the following as the footnote (1)
   *The number of cycles of each subcarrier generated by the CLT during the OFDM symbol duration (of each symbol) shall be \( K + K \times \frac{L}{128} \) second where K is an integer equal to the nominal RF frequency of the subcarrier (Hz) divided by the nominal subcarrier spacing (Hz), and L is an integer related to the cyclic prefix wherein L=128*(DSNcp*10^-6) * 50000

4. Replace the last bullet, which starts with "The phase of each subcarrier within one OFDM is the same, ...", with
   *The symbol clock and carrier frequency clock will both be derived from the 10.24 MHz Master Clock since this section requires that the subcarrier clock is locked to the 10.24 MHz Master Clock and locking the OFDM clock to the 10.24 MHz Master Clock .

ED Note: the terms "carrier frequency clock" and "RF carrier" do not appear in the draft hence they were removed from the above statement.

At pg 162 line 16 change:
   The "locking" of subcarrier "clock and carrier" are defined and characterized by the following rules
   To
   The synchronization of then subcarrier clock and subcarrier frequency are defined and characterized by the following rules

Response

ACCEPT IN PRINCIPLE.

Make the following corrections in section 101.4.2.3

1. 2nd bullet: per comment
   change the equation to: subcarrier clock frequency = \( \frac{20}{4096} \times \) Master Clock frequency

TYPE: TR/technical required
ER/editorial required
GR/general required
T/technical
E/editorial
G/general

COMMENT STATUS: D/dispatched
A/accepted
R/rejected
RESPONSE STATUS: O/open
W/written
C/closed
Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

Page 32 of 63
5/20/2015 10:31:45 AM
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Cl 101 SC 101.4.2.3 P 162 L 21 # 3392
Remen, Duane Huawei

Comment Type T Comment Status A
The Equation following this statement needs an Eq Number so it can be referenced by PICS

The "MUST" on line 21 seems to be D3.1 carry-over and the sentence is poorly worded.

SuggestedRemedy
Change para style to numbered equation.
Change:
"The number of cycles of each subcarrier generated by the CLT during one period of the subcarrier clock (for each OFDM symbol) MUST be an integer number."
to:
"The number of OFDM clock cycles of each subcarrier generated by the CLT during one period of the subcarrier clock is an integer number."

Response Response Status C
ACCEPT.
See Cmt# 3566

Cl 101 SC 101.4.2.4 P 162 L 41 # 3382
Remen, Duane Huawei

Comment Type T Comment Status A
DS_OFDM_ID formally defined in Cl 102.4.1.7.2 pg 255 In 10 and should be used here where we discuss SC configuration.

SuggestedRemedy
Move definition of DS_OFDM_ID from 102.4.1.7.2 to 101.4.2.3.5
Add ref at 102.4.1.7.2 to 101.4.2.3.5

Pg 162 In 43 change:
"... using the DS_ModTypeSC(n) variables (where 0 <LTE> n <LTE> 4095). These variables allow the PHY to configure ... "
to:
"... using the DS_ModTypeSC(n) variables (where 0 <LTE> n <LTE> 4095) in conjunction with DS_OFDM_ID. The OFDM channel being configured is determined by DS_OFDM_ID. The DS_ModTypeSC(n) variables configure ... "
(<LTE> above is the symbol "less than or equal to")

Response Response Status C
ACCEPT.

Cl 101 SC 101.4.2.6.1 P 163 L 13 # 5008
Laubach, Mark Broadcom

Comment Type T Comment Status A
Null subcarriers in the downstream need to be modulated by prbs:
Change:
"Nulled subcarriers are not modulated except when being used as a scattered pilot in the downstream direction (see 101.4.2.6.1)"
to:
"Nulled subcarriers are BPSK modulated using the pseudo-random sequence generated by the 13-bit linear feedback shift register, illustrated in Figure 101-25 except when being used as a scattered pilot in the downstream direction (see 101.4.2.6.1)"

SuggestedRemedy
As per comment.

Response Response Status C
ACCEPT.

Cl 101 SC 101.4.2.4.3 P 163 L 27 # 3547
Kliger, Avi Broadcom

Comment Type TR Comment Status A
Rev
May the 22 MHz contiguous band include nulls?

SuggestedRemedy
Clarify the specifications accordingly. A null subcarrier is not "excluded"

Response Response Status C
ACCEPT IN PRINCIPLE.
Change:
"There is at least one contiguous 22 MHz or greater band of subcarriers with an assigned bit loading in any single 192 MHz OFDM channel."
to:
"There is at least one contiguous 22 MHz or greater band of active subcarriers with an assigned non-zero bit loading in any single 192 MHz OFDM channel."

Cl 101 SC 101.4.2.8 P 165 L 46 # 3530
Laubach, Mark Broadcom

Comment Type ER Comment Status A
Ed/TBD
Not sure what this editors note refers to at this time. Figure 101-2 is a state diagram. Delete this EN.

SuggestedRemedy
As per comment.

Response Response Status C
ACCEPT.
This requirement is a duplicate of that at line 12. *The CLT shall follow Step 1 through Step 8 as specified below for defining the frequencies for the location of these continuous pilots.*

**SuggestedRemedy**

Strike the sentence.

---

This Step is already required per statement pg 168 ln 12:

"The CLT shall transmit this continuous pilot pattern to the CNUs in the system and communicate the placement using the PHY Link."

**SuggestedRemedy**

Change to read:

"The CLT transmits this continuous pilot pattern to the CNUs in the system and communicate the placement using the PHY Link."

---

**Editors Note** (to be removed prior to publication): May need to adjust "zero-bit-loaded” via more socialization on its use.

zero bit-load 3x 171-25, 171-27, & 172-16

---

Move the text as the first sentence in Subclause 101.4.2.10.1.

---

As per comment.
### IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

#### Draft 1.4

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#### Comment Type: T  Comment Status: A  Note p172 l24

A note seems to be an inappropriate place for a requirement:

*"Note that downstream RF spectrum availability as well as device implementation will determine OFDM channel presence and actual subcarrier use. The symbol mapping function therefore shall process all active subcarriers per symbol across all OFDM channels."*

**Suggested Remedy**

Strike "Note that" and change para style so the statement reads:

"Downstream RF spectrum availability as well as device implementation will determine OFDM channel presence and actual subcarrier use. The symbol mapping function therefore shall process all active subcarriers per symbol across all OFDM channels."

**Response**  
ACCEPT.

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#### Comment Type: E  Comment Status: A  Note p172 l24

Para starting "Note that downstream RF spectrum ..." should be in t,text style

**Suggested Remedy**

Per Comment

**Response**  
ACCEPT IN PRINCIPLE.  
See Cmt# 3397

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#### Comment Type: E  Comment Status: A  Ed/TBD

EDITORS NOTE (to be removed prior to publication): a state diagram is needed for this subclause.  
It is my opinion that the bit loading function is described in sufficient detail that a state diagram is not needed.

**Suggested Remedy**

Remove the Ed Note

**Response**  
ACCEPT.

---

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#### Comment Type: TR  Comment Status: A  Rev

Correcting some equation/notation errors, adding text and a generator polynomial as needed for clarification of operation.  
Page 179, Line 4, Figure 101-24 has an error as the left-most XOR has no output.

**Suggested Remedy**

Update subclause 101.4.2.9 as per attached prodan_3bn_10_0514.pdf (and fn).  CMP files are also provided to indicate the changes.

**Response**  
ACCEPT IN PRINCIPLE.  
Per suggestion with the following modifications:  
Pg 175 ln 20 should ref 101.4.2.9.5 not 45.2.1.108 as in prodan_3bn_10_0514.  
Pg 175 in 38 should ref Equation (101-10) not 101-6 as in prodan_3bn_10_0514.  
Pg 178 in 27 change style to numbered eq.  
Pg 179 in 4 the illustration of the CRC S/R will be changed by the removal the the up arrow entering XOR by Gm=1 and addition of a left arrow on the same signal line entering box cm-1.

**Response**  
ACCEPT IN PRINCIPLE.  
Per suggestion with the following modifications:  
Pg 175 ln 20 should ref 101.4.2.9.5 not 45.2.1.108 as in prodan_3bn_10_0514.  
Pg 175 in 38 should ref Equation (101-10) not 101-6 as in prodan_3bn_10_0514.  
Pg 178 in 27 change style to numbered eq.  
Pg 179 in 4 the illustration of the CRC S/R will be changed by the removal the the up arrow entering XOR by Gm=1 and addition of a left arrow on the same signal line entering box cm-1.

**Response**  
ACCEPT IN PRINCIPLE.  
Per suggestion with the following modifications:  
Pg 175 ln 20 should ref 101.4.2.9.5 not 45.2.1.108 as in prodan_3bn_10_0514.  
Pg 175 in 38 should ref Equation (101-10) not 101-6 as in prodan_3bn_10_0514.  
Pg 178 in 27 change style to numbered eq.  
Pg 179 in 4 the illustration of the CRC S/R will be changed by the removal the the up arrow entering XOR by Gm=1 and addition of a left arrow on the same signal line entering box cm-1.
Comment Type: E  Comment Status: R
Clauses 101.4.3.1 & 101.4.3.2 have no text at the moment

Suggested Remedy
Not sure what to add right now.

REJECT.
Nothing to do at the moment.

Comment Type: T  Comment Status: A
Remove this subclause title. It is a leftover and will contain no future text.

Suggested Remedy
As per comment.

ACCEPT IN PRINCIPLE.
See Cmt# 3548

Comment Type: TR  Comment Status: A
There is no interleaver defined in the upstream

Suggested Remedy
Remove section 101.4.3.10 and all references to it

ACCEPT IN PRINCIPLE.
Per Comment Pg 201 Ln 28 change:
"Pilots are inserted after the RB Frame is processed by the symbol mapper (see 101.4.2.8) and the interleaving functions (see 101.4.3.10) and before the RB Frame is passed to the IDFT function." to:
"Pilots are inserted after the RB Frame is processed by the symbol mapper (see 101.4.2.8) and before the RB Frame is passed to the IDFT function."

Comment Type: T  Comment Status: A
The text doesn't specify how to handle pre-equalizer coefficients of subcarriers that are excluded

Suggested Remedy
Add the following text below line 29:
The CNU shall use a default value of 1+j0 for all pre-equalizer coefficients of the used and unused subcarriers. The CNU shall set to zero all pre-equalizer coefficients that correspond to the excluded subcarriers.
The CNU shall set the pre-equalizer coefficient to one for any subcarrier whose status is changed from excluded to non-excluded. At the next probe opportunity the CNU shall use a pre-equalization coefficient of 1+j0 on the subcarriers whose status has changed.

ACCEPT IN PRINCIPLE.
*** See Topic PreEq ***
This is included in remein_3BN_04_0515.pdf

Suggestion: At initialization and reset require all SC to be excluded and all PreEq coef to be zero (value 0 + j0). If a SC is set from excluded to non-excluded then the PreEq for that SC is automatically set to one (value 1+j0). If a SC is set from non-excluded to excluded automatically set to zero (value 0 + j0).

Change:
"A CNU shall use a default value of 1+j0 for all pre-equalizer coefficients." to:
"A CNU shall use a default value of 0+j0 for all pre-equalizer coefficients. Changing a subcarrier from excluded to active or visa versa shall cause the pre-equalizer coefficients for that subcarrier to be automatically set to a value of 1 + j0 (for subcarriers set to active) or 0 + j0 (for subcarriers set to excluded)."
This set of 3 requirements can be simplified, steps 2 & 3 have nothing to do with normalization:

1) Upon applying any updates, the CNU shall normalize the new calculated coefficients as follows: mean (abs (Ck)^2 ) = 1 (summation is over all k subcarriers, which are active subcarriers).
2) The CNU shall apply the newly calculated coefficients for transmitting within 10 ms after receiving an update via a PHY Link message.
3) The newly calculated coefficients for transmitting shall take affect at the beginning of a transmission.

Suggested Remedy

Change to read:

"The CNU shall normalize the new calculated coefficients by adjusting the mean of (abs (Ck)^2 ) to be 1. The summation is over all k subcarriers, which are active subcarriers. The CNU shall apply the newly calculated coefficients for transmitting at the beginning of a transmission within 10 ms after receiving an update via a PHY Link message."

Suggested Remedy

Add the following text below line 43:

"When switching from current upstream profile to the next profile where there is a change between excluded and active subcarrier use, the CNU upstream PHY shall be reset, see xxx.xx”. Editor to add cross reference to appropriate subclause.

Suggested Remedy

As per comment.

Omit the note the end of the first para and from Table 102-13:

"Note that setting a significant number of subcarriers from excluded to active may cause interference to existing services on the coax cable distribution network and it is therefore recommended that the CLT reset the EPoC network prior to making such changes.”.

Remove the editor’s note at lines 44-49.
**IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments**

**Draft 1.4**

**Comment Type**: TR

**Comment Status**: A

**Kliger, Avi**

**Broadcom**

**Comment Type**: TR

**Comment Status**: A

**PreEq Rev**

---

**CT 101 SC 101.4.3.11.1 P 207 L 49 # 3564**

**Kliger, Avi**

**Broadcom**

**Comment Type**: TR

**Comment Status**: A

**PreEq Rev**

**CLT pre-equalization operation is verified subject to specified conditions using the described method**

**Suggested Remedy**

Add the following text to the section 101.4.3.11.1:

"The CMTS MUST be able to calculate and distribute initial pre-equalizer coefficients to reduce the channel amplitude variation, by 0.8 dB or more corresponding to a 3 dB increase in MER from 16 dB to 19 dB, under the following conditions:

*As measured by a spectrum analyzer or equivalent, on upstream probes.

*The probe signal power into CMTS burst receiver is +5.4 dBmV ±1 dB (approximately 0 dBmV per 6.4 MHz).

*An OFDMA channel with 22 MHz encompassed spectrum, where all subcarriers within the encompassed spectrum are active subcarriers, is measured.

Pre-equalization operation subject to these conditions is verified using the following method:

The test modulator generates the first transmission using a compliant probe:

*This transmission is input into the spectrum analyzer, with an initial "flat" test channel, achieving 0.3 dB p-p amplitude variation or less after calibration of the spectrum analyzer (corresponding to a residual MER of 35 dB).

*Add a micro-reflection into the test channel with an amplitude of -16 dB ±0.5 dB and a delay of 0.3125 microseconds ±0.5 nanoseconds compared to main path.

*Verify the channel (except for the echo) changes by no more than 0.3 dB p-p, in addition to the 2.78 dB p-p signal amplitude variation induced by the micro-reflection (the 0.3 dB tolerance allows the maximum amplitude variation to increase to 3.08 dB p-p corresponding to total MER of 15.3 dB or a residual MER of 35 dB).

The test modulator generates the second transmission using a compliant probe sent to both the spectrum analyzer and the CMTS burst receiver (unit under test) with a CNR > 35 dB:

*The spectrum analyzer measures and records the amplitude variation over the spectrum of subcarriers (this is the "reference amplitude variation measurement" of the test).

*The CLT OFDMA receiver develops pre-equalizer coefficients.

*The CLT formats and transmits compliant commands for the pre-equalizer coefficients.

*The downstream test receiver validates reception of pre-equalization coefficients.

Pre-equalization coefficients are implemented by the test modulator prior to the third transmission:

*The spectrum analyzer measures and records the amplitude variation over the spectrum of subcarriers for this third transmission from the test modulator, which has been pre-equalized.

*The reduction in this third amplitude variation measurement at the spectrum analyzer compared to the initial amplitude variation measurement of the second transmission is measured.

*The required minimum reduction in amplitude variation or better is observed.

---

**Ed Note**: the above tests only the CLT, shouldn't there be an equivalent test for the CNU?

---

**CT 101 SC 101.4.3.12.1 P 208 L 54 # 3565**

**Kliger, Avi**

**Broadcom**

**Comment Type**: TR

**Comment Status**: A

**Rev**

**The CP size must be greater than the windwowingf size except for PHY discovery,**

**Suggested Remedy**

Add the following text to the end of sub section 101.4.3.12.1:

"The CP size (USNcp) shall always be greater than the USNrp value.

As in 101.4.2.12 to end of para at pg 208 ln 23 add:

*CP and Window sizes shall be selected such that the USNrp value is less than the USNcp value.*

Pg 183 In 3 change:

*CP and Window sizes shall be selected such that the USNrp value is less than the CP value*

*CP and Window sizes shall be selected such that the USNrp value is less than the DSNrp value*

---

**CT 101 SC 101.4.3.2 P 186 L 24 # 3567**

**Kliger, Avi**

**Broadcom**

**Comment Type**: T

**Comment Status**: A

**PreEq Rev**

**Text for this sub-section is missing**

**Suggested Remedy**

Add text as proposed in the presentation

**Response**: ACCEPT IN PRINCIPLE.

See kilger_3bn_01d_0515.pdf
Comment Type \text{T} \quad \text{Comment Status} \quad \text{A}

On figure 102-19 *AmpOffset* is used but the text uses PowerOffset.
Probing is also used for pre-equalization settings.

\textbf{SuggestedRemedy}
- Change AmpOffset to PowerOffset in Figure 102-19
- Add update pre-equalizer setting in line 23

\textbf{Response} \quad \text{Response Status} \quad \text{C}

\text{ACCEPT.}

---

Comment Type \text{T} \quad \text{Comment Status} \quad \text{R}

Type 2 RB follows the burst marker.

\textbf{SuggestedRemedy}
- Correct text

\textbf{Response} \quad \text{Response Status} \quad \text{C}

\text{REJECT.}
- See Cmt# 3375 (topic Fig 101-7)
- The symbol mapper has no way to predict when the end of burst will come so it can backtrack and place a Type 2 pilot before the end marker.

---

Comment Type \text{T} \quad \text{Comment Status} \quad \text{R}

Type 2 RB precedes the stop burst marker.

\textbf{SuggestedRemedy}
- correct text

\textbf{Response} \quad \text{Response Status} \quad \text{C}

\text{REJECT.}
- See Cmt# 3375 (topic Fig 101-7)
- The symbol mapper has no way to predict when the end of burst will come so it can backtrack and place a Type 2 pilot before the end marker.
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Draft 1.4

Cl 101 SC 101.4.3.4.2 P 190 L 32 # 3561
Kliger, Avi Broadcom

Comment Type T Comment Status A
for the upstream n<=12

Suggested Remedy
correct text

Response Response Status C
ACCEPT.

Cl 101 SC 101.4.3.4.3 P 190 L 44 # 3555
Kliger, Avi Broadcom

Comment Type T Comment Status A
"there may be up to 14 exclusion bands internal to a single 192 MHz OFDM channel" -
Limiting number of exclusion bands to 14 is not needed.

Suggested Remedy
Remove limitation or increase it to 64

Response Response Status C
ACCEPT IN PRINCIPLE.
Added pg 190
Change
"Typically there is a band edge Exclusion Band at both the top and bottom of the OFDM channel and there may be up to 14 exclusion bands internal to a single 192 MHz OFDM channel."
to
"There is a band edge Exclusion Band at both the top and bottom of the OFDM channel."

Cl 101 SC 101.4.3.4.4 P 191 L 4 # 3551
Kliger, Avi Broadcom

Comment Type T Comment Status A
US QAM Rev
8192-QAM and 16384-QAM are not supported by upstream.

Suggested Remedy
Remove

Response Response Status C
ACCEPT.

Cl 101 SC 101.4.3.5.1 P 191 L 23 # 5446
Remein, Duane Huawei

Comment Type T Comment Status A
101.4.3.5.1 Variables
These are all provisioned variable and we should state that.

Suggested Remedy
For the 4 variables in this section change:
"When this variable is ..."
to:
"When this provisioned variable is ..."

Response Response Status C
ACCEPT.

Cl 101 SC 101.4.3.6.1 P 193 L 38 # 5502
Laubach, Mark Broadcom

Comment Type T Comment Status A Ed/TBD
Line 38: Change "interleaver and pilot insertion functions" to "pilot inserting and staging functions."
Line 31: Add to end of sentence for "EX": "; i.e., nulled subcarriers and excluded subcarriers. Remove underline under "EX".
Line 39: delete editors note.

Suggested Remedy
As per comment.

Response Response Status C
ACCEPT.

Cl 101 SC 101.4.3.6.2 P 194 L 26 # 5447
Remein, Duane Huawei

Comment Type E Comment Status A Ed/TBD
No reason to cross reference to Table 101-1 as it is just another cross reference.

Suggested Remedy
Remove "[see Table 101-1]"

Response Response Status C
ACCEPT.
Comment Type: E  Comment Status: A

Suggested Remedy

Everywhere else EX is in quotes, there is only one function "is EX, this functions ...

Response  Response Status: C

ACCEPT.

---

Comment Type: T  Comment Status: A

Suggested Remedy

Change to read:
is "EX", this function ...

Response  Response Status: C

ACCEPT.

---

Comment Type: T  Comment Status: A

Suggested Remedy

Change wording to:

The CLT grant generator ensures a minimum gap time between bursts from any CNU equal to the transmission time of one (1) resource block expressed in units of time_quantum (see 77.2.2.2)."

In 103.3.2.4 add the following requirement:

"The CLT shall ensure that a minimum gap time between bursts from any two CNUs equal to the transmission time of one (1) resource block expressed in units of time_quantum."

Add PICS statement to cover new requirement.

Response  Response Status: C

ACCEPT IN PRINCIPLE.

---

Comment Type: T  Comment Status: A

Suggested Remedy

Both real and imaginary axes of a QAM constellation shall be scaled using the scaling factor given in Table 101-20. These scaling factors ensure that the mean square value of all QAM constellations are equal to 1.0.

Response  Response Status: C

ACCEPT.
Cl 101 SC 101.5 P 214 L 11 # 3367
Remein, Duane Huawei

**Comment Type E**  **Comment Status A**  **Ed/TBD**

"EDITORS NOTE (to be removed prior to publication): This subclause is reserved for the summary of the power-saving capabilities for this PMD type. This material would be all new in the amendment added by IEEE P802.3bn EPOC Task Force"

**Suggested Remedy**

Strike the section. Power-saving capabilities are documented in Cl 100.

**Response**  **Response Status C**

ACCEPT.

Cl 101 SC 101.6 P 214 L 16 # 3506
Laubach, Mark Broadcom

**Comment Type T**  **Comment Status A**  **TimeSync Rev**

Remove 101.6 subclause title and following editors note. If documented, time sync will move to Clause 102 with use of the PHY Link timestamp.

**Suggested Remedy**

As per comment.

**Response**  **Response Status C**

ACCEPT. See resolution to Cmt# 3457

Cl 101 SC 101.6 P 214 L 17 # 3457
Powell, Bill Alcatel-Lucent

**Comment Type T**  **Comment Status A**  **TimeSync Rev**

101.6 Timesync Capability has no text at moment

**Suggested Remedy**

Add suggested text from powell_3bn_02_0515.pdf

**Response**  **Response Status C**

ACCEPT IN PRINCIPLE.

Change Editors note from:

"EDITORS NOTE (to be removed prior to publication): This subclause is reserved for the summary of the TimeSync capabilities for this PMD type. Given that it is a new PMD design, we can embed TimeSync capability from day one. This involves primarily guaranteeing repeatable and stable delay as well as support for specific capability registers. See IEEE Std 802.3-2012, Clause 90 for more details. This material would be all new in the amendment added by IEEE P802.3bn EPOC Task Force."

to:

"EDITORS NOTE (to be removed prior to publication): This subclause is reserved for the summary of the Time of Day transport feature which is expected to be added before version 2.1 of this draft."

Cl 101 SC 101.9 P 136 L 45 # 3472
Laubach, Mark Broadcom

**Comment Type T**  **Comment Status A**  **Fig 101-7**

Figure 101-7, update top of figure for burst marker updates. This has likely be done in another comment.

Line 37: designate/illustrate a Bq 65 bit block and label as "Burst time header" with an arrow pointing to that block. This block is after the two "Idles" blocks and before the first "MAC Data" block.

**Suggested Remedy**

As per comment.

**Response**  **Response Status C**

ACCEPT IN PRINCIPLE.

Added pg & line info

See Cmt# 3375 for update to Figure 101-7.
<table>
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<th>Cl</th>
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<th>P</th>
<th>L</th>
<th>Line</th>
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<th>Comment Status</th>
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<tbody>
<tr>
<td>101</td>
<td>102.2.1.1</td>
<td>228</td>
<td>45</td>
<td>3399</td>
<td>T</td>
<td>A</td>
<td>Remnants of two symbol sizes and no mention of windowing: &quot;The downstream PHY Link shall use the same OFDM Symbol size and cyclic prefix duration as the downstream MAC data channel.&quot;</td>
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<tr>
<td>102</td>
<td>102.1.1</td>
<td>218</td>
<td>44</td>
<td>5408</td>
<td>T</td>
<td>A</td>
<td>It may be useful to include the timestamp in the upstream direction for TOD Sync. Suggested Remedy In Figure 102-2 EPFH replace &quot;R(32b)&quot; with &quot;Timestamp(32b)&quot; In 102.3.2.1 pg 244 line 35 change: &quot;The upstream PHY Frame Header includes a Type field, the Return Frame ID field, the PHY SA and a CRC(32) as illustrated in Figure 102-2. ...&quot; To: &quot;The upstream PHY Frame Header includes a Type field, the Return Frame ID field, the PHY SA, the PHY Timestamp field, and a CRC(32) as illustrated in Figure 102-2. ... The PHY Timestamp is a 32 bit field set from the LocalTS.&quot;</td>
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<tr>
<td>102</td>
<td>102</td>
<td>217</td>
<td>3</td>
<td>3368</td>
<td>ER</td>
<td>A</td>
<td>EDITORS NOTE (to be removed prior to publication): Probe processing needs to be pulled out of the PHY Link. If everyone is comfortable with the architecture as is (part of PHY Link) then we can leave it as it is. Suggested Remedy Remove the Ed Note.</td>
<td></td>
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<tr>
<td>102</td>
<td>102.1.2</td>
<td>219</td>
<td>30</td>
<td>3553</td>
<td>E</td>
<td>R</td>
<td>In figure 102-3 FEC and Sym map blocks are split while descrambler block is not. Suggested Remedy Split descrambler for consistency Response</td>
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</tr>
</tbody>
</table>
Remove the following Editors Notes:

Pg Ln
220 43
223 21
233 52
250 45

Suggested Remedy
Per comment.

Response
ACCEPT.

EDITORS NOTE (to be removed prior to publication): not all variables need to be included in Cl 45. We need to determine how to index variables that need to be communicated over the PHY Link that are not included in Cl 45. Current rule is:

If 1.1900 <= RegAdd <= 1.1999 Then Index = (RegAdd - 1.1900)*1000 (i.e., 0-99)
46 indexes in this range were in use as of Draft 1.4.
If 12.0000 <= RegAdd Then Index = (RegAdd - 12.0000)*1000 + 1000 (i.e., 1000 + )
12287 indexes in this range are in use as of Draft 1.4
If variable is not in Cl 45 use indexes 500-999

Replace with the following note:

NOTE: Most of the variables transferred via the PHY Link are reflected in Clause 45. The EPoC Index and bits are determined from Clause 45 register designations using the following rules:

If 1.1900 <= RegAdd <= 1.1999 Then Index = (RegAdd - 1.1900)*1000 (i.e., 0-99)
If 12.0000 <= RegAdd Then Index = (RegAdd - 12.0000)*1000 + 1000 (i.e., 1000 + )
If variable is not in Cl 45 use indexes 500-999.

Change to

NOTE: Most of the variables transferred via the PHY Link are reflected in Clause 45. The EPoC Index and bits are determined from Clause 45 register designations using the following rules:

If 1.1900 <= RegAdd <= 1.1999 Then Index = (RegAdd - 1.1900)*1000 (i.e., 0-99)
If 12.0000 <= RegAdd Then Index = (RegAdd - 12.0000)*1000 + 1000 (i.e., 1000 + )
If variable is not in Cl 45 indexes between 500 and 999 are used and are given in the variable definition.

Use Style NOTE
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<td>Huawei</td>
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**Comment Type** T  **Comment Status** A

NewCNU_Rng not formally defined or used.

**SuggestedRemedy**

Add to 102.4.1.7.2 Variables

NewCNU_Rng

TYPE: 16-bit integer

This variable indicates the range of the CNU corresponding to Allowed CNU_ID in units of OFDM clock (1/204.8 MHz).

Add to the end of 102.4.1.4:

"The CLT calculates the range of the CNU based on the PHY Link Response and uses this to report the NewCNU_Rng when declaring the CNU link-up (see 102.4.3)."

Update reference in 45.2.1.142.1 pg 48 ln 18 to 102.4.1.7.2

**Response**  **Response Status** C

ACCEPT.

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<td>Huawei</td>
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</table>

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

DS_PhyLinkStart not formally defined and should remove ref to Cl 45 here "(see DS PHY Link Start parameter, 45.2.1.138)"

**SuggestedRemedy**

Change

"(see DS PHY Link Start parameter, 45.2.1.138)"

to

"(see 102.2.6.3)"

Add to 102.2.6.3 Variables

DS_PhyLinkStart

TYPE: 12-bit integer

This variable sets the starting subcarrier in OFDM Channel 1 of the downstream PHY Link. It specifies the lowest frequency subcarrier of the downstream PHY Link used to carry PHY Link information bits.

In Cl 45.2.1.138.1 pg 46 ln 6 update reference to 102.2.6.3

Note that Cl 45.2.1.138.1 should be combined with 45.2.1.138 per IEEE Style guide (no single subclauses). Likewise 45.2.1.139 and 45.2.1.139.1 should be combined.

**Response**  **Response Status** C

ACCEPT.

Changed pg to 228 fm 229

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

Several instance of LocalTS_cnt should be LocalTS

**SuggestedRemedy**

Globally replace LocalTS_cnt with LocalTS

**Response**  **Response Status** C

ACCEPT.
IEEE 802.3bn EPON Protocol over Coax (EPOC) TF 4th Task Force review comments

Draft 1.4

Final Responses

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<th>SC 102.2.3</th>
<th>P 263</th>
<th>L 53 #</th>
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<td>Fm pg 263 In 53: “EDITORS NOTE (to be removed prior to publication): we need to define a minimum time of 2.5 ms between the EPCH message and the beginning of the Probe Period.”</td>
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<tr>
<td>SuggestedRemedy</td>
<td>Remove the Ed Note</td>
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<tr>
<td>At pg 263 In 52 add</td>
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<tr>
<td>“The CNU shall decode and be capable of acting on EPoC Probe Control Header instructions included in a downstream PHY Link frame within 2.5 ms.”</td>
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<tr>
<td>DS requirement is duplicate pg 234 In 39 &amp; 237 In 24</td>
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<tr>
<td>“The CLT shall only transmit the valid values of the PHY DA and OPCODE fields as given in Table 102-8, and Table 102-10 respectively.”</td>
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<tr>
<td>SuggestedRemedy</td>
<td>Change to</td>
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<tr>
<td>“The CLT shall only transmit the valid OPCODE fields as given in Table 102-10.”</td>
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<td>EDITORS NOTE (to be removed prior to publication): We might want to consider creating a variable that the CNU can pass to the CLT to indicate what its min response time is if it can be shorter than this. For example:</td>
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<td>US_PlnkRspTm</td>
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<tr>
<td>TYPE: 16-bit integer</td>
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</tr>
<tr>
<td>This read only variable indicates the PHYs minimum response time to a downstream PHY Link instruction in units of 16/204.8 MHz. The maximum value for this variable is 61440 (4.8 ms).</td>
<td></td>
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<tr>
<td>A complementary register may be defined in Cl 45.</td>
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<tr>
<td>Define variable per note, add to Cl 45</td>
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<tr>
<td>SuggestedRemedy</td>
<td>Add variable definition in 102.2.6.3</td>
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<tr>
<td>PhyLinkRspTm</td>
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<tr>
<td>This read only variable indicates the PHYs minimum response time to a downstream PHY Link instruction in units of 16/204.8 MHz. The maximum value for this variable is 61440 (4.8 ms) which is also the default value for this variable.</td>
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<tr>
<td>The assignment of bits in the PHY Link response register is shown in Table 45-98ad.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>These bits indicate the time required by a CNU to respond to an EPoC Message Block received on the PHY Link and are a reflection of the PhyLinkRspTm defined in 102.2.6.3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table 45-98ad PHY Link response time register bit definitions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bit(s)</td>
<td>Name</td>
<td>Description</td>
<td>R/Wa</td>
<td></td>
</tr>
<tr>
<td>1.1946.15:0</td>
<td>PHY Link response time</td>
<td>Time required by a CNU to respond to an EPoC Message Block</td>
<td>RO</td>
<td></td>
</tr>
<tr>
<td>aRO = Read only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At pg line 35 change</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“The CNU shall decode and be capable of acting on instructions included in a downstream PHY Link frame within 4.8 ms.”</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The CNU shall decode and be capable of acting on EPoC Message Block instructions included in a downstream PHY Link frame within 4.8 ms.”</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
At 138 line 37 replace the Ed. Note with the following:
“The CNU may indicate it is capable of a shorter response time to a downstream EPoC Message Block by setting the PhyLinkRspTm to a value of less than 61440 (4.8 ms).

Response

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>102.2.6.2</td>
<td>240</td>
<td>10</td>
<td>3407</td>
</tr>
</tbody>
</table>

Remein, Duane
Huawei

Comment Type T
Comment Status A

LocalTS is not directly visible to “Layer Management” so the following statement is false by definition:
“Changing the value of this variable while running using Layer Management is highly undesirable and is unspecified.”
However PhyTimingOffset is and cautions concerning this issue have been addressed in another comment (Cl 102.4.1.7.2 pg 255 line 2) that formally defines that variable.

SuggestedRemedy

Strike “Changing the value of this variable while running using Layer Management is highly undesirable and is unspecified.”

Response

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>102.3.1</td>
<td>254</td>
<td>43</td>
<td>3606</td>
</tr>
</tbody>
</table>

Kliger, Avi
Broadcom

Comment Type T
Comment Status A

Text must specify how the CNU shall handle the power offset value received from the CLT.

SuggestedRemedy

Add the following text in line 43:
"When the CNU receives the PhyPowerOffset variable it shall increase its transmission power by the PhyPowerOffset value if the PhyPowerOffset is negative and reduced its transmission power by the PhyPowerOffset value if PhyPowerOffset is positive”

Response

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
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</thead>
<tbody>
<tr>
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<td>102.3.1</td>
<td>254</td>
<td>43</td>
<td>3606</td>
</tr>
</tbody>
</table>

Remein, Duane
Huawei

Comment Type E
Comment Status A

Clause 45 ref.
“... per the US_PHyLinkStrt variable (see US PHY Link Start, 45.2.1.139) ...”

SuggestedRemedy

change to:
“... per the US_PHyLinkStrt variable (see 102.3.5.3) ...”

Add to 102.3.5.3
US_PHyLinkStrt

TYPE: 12-bit unsigned integer
This variable indicates the starting subcarrier of the upstream 10GPASS-XR PHY Link. It specifies the lowest frequency subcarrier of the upstream PHY Link used to carry PHY Link information bits.

In 45.2.1.139.1 change [ref] to 102.3.5.3.

Response

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
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Remein, Duane
Huawei

Comment Type T
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<td>3606</td>
</tr>
</tbody>
</table>

Kliger, Avi
Broadcom

Comment Type T
Comment Status A
Rev

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Response

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</tr>
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</tr>
</tbody>
</table>

Kliger, Avi
Broadcom

Comment Type T
Comment Status A
Rev

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Response

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<tr>
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</tbody>
</table>

Kliger, Avi
Broadcom

Comment Type T
Comment Status A
Rev

Text must specify how the CNU shall handle the power offset value received from the CLT.

SuggestedRemedy

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Response

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<tbody>
<tr>
<td>102</td>
<td>102.3.1</td>
<td>254</td>
<td>43</td>
<td>3606</td>
</tr>
</tbody>
</table>
Cl 102 SC 102.3.1.2 P 244 L 14 # 3403
Reimein, Duane Huawei

Comment Type TR Comment Status A PICS
Nowhere do we specify where the US PHY Link modulation is set, only that it is limited to those type listed in Table 100-2.
"The upstream PHY Link shall use any of the modulation formats listed under PHY Link CNU Tx/CLT Rx in Table 100-2."

Suggested Remedy
Change to read:
"The upstream PHY Link shall use any of the modulation formats listed under PHY Link CNU Tx/CLT Rx in Table 100-2 and is set using the US_PhyLnkMod variable."

In 102.3.5.3 add:
US_PhyLnkMod
TYPE: 4 bit integer
This variable sets the type of modulation used for the upstream PHY Link. The assignment of bits to each modulation type is shown below.
bit 3 2 1 0
1 x x x = reserved
0 1 1 1 = 128-QAM
0 1 1 0 = 64-QAM
0 1 0 1 = 32-QAM
0 1 0 0 = 16-QAM
0 0 1 1 = 8-QAM
0 0 1 0 = reserved
0 0 0 1 = BPSK
0 0 0 0 = reserved

In Table 102-3 add:
US PHY Link Modulation | US PHY Link control | 1.1912.15:12 | US_PhyLnkMod | 12 | 15:12

In CI 45.2.1.139 US PHY Link control register (Register 1.1912)
In table 45-98i change:
1.1912.15:12 | Reserved | Ignore on read | RO
to:
1.1912.15:12 | US PHY Link Modulation | US PHY Link modulation type | R/W

Add:
45.2.1.138.1 US PHY Link Modulation (1.1912.15:12)
Bits 1.1912.15:12 are used to set the modulation type of the US PHY Link. These bits are a reflection of the US_PhyLnkMod variable defined in 102.3.5.3.

Response Response Status C
ACCEPT IN PRINCIPLE.
Use US_PhyLnkMod instead of US_PhyLnkMod

Cl 102 SC 102.3.1.3 P 244 L 17 # 5607
Kligier, Avi Broadcom

Comment Type E Comment Status A Rev
Subclause has no text
Suggested Remedy
Remove subclause

Response Response Status C
ACCEPT.
Remove 102.3.1.3 US PHY Link Subcarrier Block Interleaving

Cl 102 SC 102.3.2.2 P 245 L 13 # 3598
Reimein, Duane Huawei

Comment Type T Comment Status A
OPCODE Write ACK & Write/Verify ACK. Some registers may include read only bits. Failure to write a Read Only bit should not be consider an unsuccessfully "received and executed write Instruction"

Suggested Remedy
Add footnote to Write ACK & Write/Verify ACK:
a a write or write verify PHY Instruction to an index that contains read only bits is considered successful when all read/write bits in teh index are written.

Response Response Status C
ACCEPT.

Cl 102 SC 102.3.3 P 246 L 8 # 3404
Reimein, Duane Huawei

Comment Type E Comment Status A
Incomplete ref: described in 102.1.4.2.1.

Suggested Remedy
Change to:
102.1.4.1.1 and 102.1.4.2.1

Response Response Status C
ACCEPT.

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
<table>
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<th>Cl 102</th>
<th>SC 102.3.4</th>
<th>P 246</th>
<th>L 17</th>
<th># 3602</th>
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<td>Broadcom</td>
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<td><strong>Comment Status</strong></td>
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<td></td>
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<tr>
<td>T</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The first and last subcarriers of the PLC should be of type-2 RBs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Response**<br>Accept in principle. <br>As per comment plus to para “The upstream PHY Link utilizes a pilot pattern to assist the CLT receiver in capturing the bursting PHY Link transmissions. The PHY Link pilot pattern is illustrated in Figure 102-17. PHY Link pilots are BPSK encoded.”<br>Add “The two edge subcarriers of the upstream PHY Link are Type 2 pilots whereas the 6 internally subcarriers are Type 1 Pilots.”

<table>
<thead>
<tr>
<th>Cl 102</th>
<th>SC 102.4</th>
<th>P 249</th>
<th>L 9</th>
<th># 3600</th>
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<tr>
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<td>Broadcom</td>
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<td><strong>Comment Type</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>Rev</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probes are used for periodic verification of the CNU's timing as well transmission power and pre-equalizer coefficients</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Response**<br>Accept in principle.<br>As per comment plus to para “The transmit power of the unaligned CNU must be controlled by the CLT with a value that is provided in the downstream PLC and is common to all initial PD responses from new CNUs. If the CNU does not receive a corresponding CNU_ID instruction from the CLT it shall retry with an increased transmission power by a step that is also provided by the CLT. This is required to prevent interference to other CNUs and to expedite the acquisition time.”

**Comment Type** | **Comment Status** | **Rev** |
| Cl 102 | SC 102.4.1.4 | P 251 | L 28 | # 3604 |
| Kliger, Avi | Broadcom | | | |
| **Comment Type** | **Comment Status** | **Rev** |
| TR | A | |
| **Suggested Remedy** | |
| The transmit power of the unaligned CNU must be controlled by the CLT with a value that is provided in the downstream PLC and is common to all initial PD responses from new CNUs. If the CNU does not receive a corresponding CNU_ID instruction from the CLT it shall retry with an increased transmission power by a step that is also provided by the CLT. This is required to prevent interference to other CNUs and to expedite the acquisition time. |

---

**Note:** The responses and suggested remedies are based on the IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments, Draft 1.4 Final Responses.
### IEEE 802.3bn EPON Protocol over Coax (EPOC) TF 4th Task Force review comments

#### Draft 1.4 Final Responses

<table>
<thead>
<tr>
<th>Cl 102</th>
<th>SC 102.4.1.5</th>
<th>P 253</th>
<th>L 48</th>
<th># 3405</th>
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</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>SuggestedRemedy</strong></td>
<td><strong>Response</strong></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>A</td>
<td>improper Figure Ref. &quot;illustrated in 102-22.&quot;</td>
<td>ACCEPT.</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Cl 102</th>
<th>SC 102.4.1.6</th>
<th>P 254</th>
<th>L 16</th>
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<td><strong>Comment Status</strong></td>
<td><strong>SuggestedRemedy</strong></td>
<td><strong>Response</strong></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td>1) include text about AssgnCNU_ID (in same index as AllwdCNU_ID) here in the discussion of CNU_ID allocation message and explain how AssgnCNU_ID and AllwdCNU_ID are used at CNU. 2) Explain how PhyPowerOffset is used at CNU 3) Add AssgnCNU_ID definition (see Sug Rem in my comment pg 264 ln 12) 4) Add formal definition for PHYPowerOffset</td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 102</th>
<th>SC 102.4.1.7.2</th>
<th>P 255</th>
<th>L 2</th>
<th># 3420</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remein, Duane</td>
<td>Huawei</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>SuggestedRemedy</strong></td>
<td><strong>Response</strong></td>
<td></td>
</tr>
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<td>T</td>
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<td>1) include text about AssgnCNU_ID (in same index as AllwdCNU_ID) here in the discussion of CNU_ID allocation message and explain how AssgnCNU_ID and AllwdCNU_ID are used at CNU. 2) Explain how PhyPowerOffset is used at CNU 3) Add AssgnCNU_ID definition (see Sug Rem in my comment pg 264 ln 12) 4) Add formal definition for PHYPowerOffset</td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>

#### Draft 1.4

<table>
<thead>
<tr>
<th>Cl 102</th>
<th>SC 102.4.1.6</th>
<th>P 254</th>
<th>L 42</th>
<th># 3406</th>
</tr>
</thead>
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<td>Remein, Duane</td>
<td>Huawei</td>
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</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>SuggestedRemedy</strong></td>
<td><strong>Response</strong></td>
<td></td>
</tr>
<tr>
<td>TR</td>
<td>A</td>
<td>Undefined variable RangingOffset. &quot;When the CNU receives the PhyTimingOffset variable it shall add the new value of PhyTimingOffset to the RangingOffset.&quot;</td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 102</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td><strong>Comment Status</strong></td>
<td><strong>SuggestedRemedy</strong></td>
<td><strong>Response</strong></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>A</td>
<td>PhyTimingOffset, and PhyPowerOffset not formally defined.</td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>

Enhancements to CNI_ID allocation:
1) include text about AssgnCNU_ID (in same index as AllwdCNU_ID) here in the discussion of CNU_ID allocation message and explain how AssgnCNU_ID and AllwdCNU_ID are used at CNU. 2) Explain how PhyPowerOffset is used at CNU 3) Add AssgnCNU_ID definition (see Sug Rem in my comment pg 264 ln 12) 4) Add formal definition for PHYPowerOffset

**SuggestedRemedy**
See remein_3bn_10_0515.pdf (also in framemaker)

See related comment on SCI 102.4.3 pg 264 ln 12 suggested topic CNU_ID_Alloc

**Response** ACCEPT IN PRINCIPLE. Use remein_3bn_10b_0515.pdf See related comment # 3417

**PhyTimingOffset**
TYPE: signed 8-bit integer
This variable is used to set the CNU upstream transmitter power by specifying the relative change, in units of 1/4 dB, the CNU is to make in order that transmissions arrive at the CLT at the desired power level. Changing the value of this variable while running using Management is highly undesirable and is unspecified.

**PhyPowerOffset**
TYPE: signed 32-bit integer
This variable is used to align the CNU to the upstream OFDM timing. PhyTimingOffset is in units of 1/204.8 MHz and a negative value causes the timing of the CNU transmissions to be delayed. Changing the value of this variable while running using Management is highly undesirable and is unspecified.

Update reference in 45.2.1.120 & 45.2.1.121 pg 49 ln 2 & 23

**Response** ACCEPT.
Assuming we change TxEnable to PD_Enable the new variable does not fully describe the state of link-up ready.
Create a new variable for this:

**SuggestedRemedy**

Create new variable LinkUpRdy.
Change at Pg 264 ln 11 "Once the CLT has verified the CNU is in the link-up status by reading the TxEnable variable as TRUE it may set ."
To: "Once the CLT has verified the CNU is in the link-up status by reading the Variable listed in the Link-Up column of Table 102-3 it shall set the LinUpRdy variable to TRUE and it may set ."

Pg 266 ln 17 change:
"to be link-down and sets LinkUpRdy, PhyDiscComplete and PD_Enable to FALSE"
To: "to be link-down and sets LinkUpRdy, PhyDiscComplete and PD_Enable to FALSE"
at Pg 267 In 4 and pg 267 In 9 change:
"It may further force the CNU to reassess its’ readiness for participation on the network by setting TxEnable to FALSE."
To: "It may further force the CNU to reassess its’ readiness for participation on the network by setting PD_Enable and LinkUpRdy to FALSE.

Add Row to Table 102-13:
<table>
<thead>
<tr>
<th>LinkUpRdy</th>
<th>0</th>
<th>10</th>
<th>(blank)</th>
</tr>
</thead>
</table>

Add definition in 102.4.1.7.2
LinkUpRdy
TYPE: Boolean
This Boolean variable is set to TRUE by the CLT when it has verified all of the variables required for Link-Up state in Table 102-13. The variable is set to FALSE on reset or as describe in 102.4.4.

SCI 45.2.1.131 Pg 37 Ln 47 change table 98a as follows:
Add 1.1900:10 | Link Up Ready | 1.1900:10 | Link Up Ready |
Change 1.1900:15:10 to 1.1900:15:11
Add SCI 45.2.1.131.1 to read: "Link Up Ready (1.1900:10)"
"Bit 1.1900:10 indicates that the CNU is ready for the link-up state. This bit is a reflection of the LinkUpRdy variable defined in 102.4.1.7.2."
Add row to Table 102-3:

**SuggestedRemedy**

Create new variable LinkUpRdy.
Change at Pg 264 In 11 "Once the CLT has verified the CNU is in the link-up status by reading the Variable listed in the Link-Up column of Table 102-13 it shall set the LinUpRdy variable to TRUE."

**SuggestedRemedy**

Change "(see 45.2.1.141)" to "(see 102.4.3.3)"
New definition included in remein_3bn_10_0515.pdf:
AssignCNU_ID
TYPE: boolean
The value of this variable is used to indicate if the associated CNU_ID value has been assigned to a CNU by the PHY. When the flag is set to a one the associated CNU_ID has been assigned to a new CNU whereas when the flag is set to zero the associated CNU_ID has not been assigned.
Update reference in 45.2.1.141.1 pg 47 In 25 to 102.4.3.3
See related comment on SCI 102.4.1.6 pg 254 In 16 suggested topic CNU_ID_Alloc

**SuggestedRemedy**

Correct table 102-13 accordingly
IEEE 802.3bn EPON Protocol over Coax (EPOC) TF 4th Task Force review comments

Draft 1.4

Final Responses

Cl 102 SC 102.4.3 P 265 L 47 # 3573
Laubach, Mark

Comment Type T Comment Status R

Turn OFDMA_CLKSync and DS_PHY_LinkSync into variables and remove the four TBDs. Editors to assign Index and bit(s) values. Editors to add to appropriate clause tables and clause 45 as needed.

SuggestedRemedy
As per comment.

Response Response Status C
REJECT.
For DS_PHY_LinkSync See Cmt# 3431

For OFDMA_CLKSync need a definition.

Cl 102 SC 102.4.3 P 265 L 49 # 3431
Remein, Duane

Comment Type T Comment Status A

DS_PHY_LinkSync is not a required variable; if the PHY Link is not synchronized the rest of the variables listed in Table 102-13 cannot be obtained.

SuggestedRemedy
remove row from table
Also remove Ed Note on pg 266 In 1 (assuming OFDMA_CLKSync is defined).

Response Response Status C
ACCEPT.

Cl 102 SC 102.4.4.1 P 266 L 27 # 3507
Laubach, Mark

Comment Type T Comment Status A

After reviewing DOCSIS D3.1 MULPI I05, the CNU may be receiving the DS PHY Link, but not properly receiving one or more downstream channels properly.

Consider adding the following new row after DS PHY Link loss of frame:
Condition "DS Data FEC Lost of lock". Description "After successfully decoding FEC codewords in a prior downstream frame, the PCS is unable to decode any FEC codeword in a downstream frame for 3 or more consecutive frames."

Line 50: delete editors note.

SuggestedRemedy
As per comment.

Response Response Status C
ACCEPT IN PRINCIPLE.

Remove EDITOR NOTE pg 266 ln 50

Cl 103 SC 103.1 P 271 L 5 # 3353
Remein, Duane

Comment Type E Comment Status A

Change Protocol to protocol (2x) and Coax to coax in this para.

SuggestedRemedy
Per comment

Response Response Status C
ACCEPT.

Cl 102 SC 102.4.4.1 P 266 L 47 # 3573
Laubach, Mark

Comment Type T Comment Status Rev

After reviewing DOCSIS D3.1 MULPI I05, the CNU may be receiving the DS PHY Link, but not properly receiving one or more downstream channels properly.

Consider adding the following new row after DS PHY Link loss of frame:
Condition "DS Data FEC Lost of lock". Description "After successfully decoding FEC codewords in a prior downstream frame, the PCS is unable to decode any FEC codeword in a downstream frame for 3 or more consecutive frames."

Line 50: delete editors note.

Response Response Status C
ACCEPT IN PRINCIPLE.

Remove EDITOR NOTE pg 266 ln 50

Cl 103 SC 103.1 P 271 L 5 # 3353
Remein, Duane

Comment Type E Comment Status A

Change Protocol to protocol (2x) and Coax to coax in this para.

SuggestedRemedy
Per comment

Response Response Status C
ACCEPT.
Comment Type E  Comment Status A  Rev

Include a statement regarding similarities between Cl 77 & 64 with Cl 103 and a table that summarizes the major differences between Cl 103 defined items (variables, counters, functions etc.) and those of Cl 77.

Suggested Remedy

At the end of Cl 103..1 add the following:

"The EPoC Multipoint MAC Control shares much in common with prior versions of this protocol defined in Clause 64 and Clause 77. There are a number of variables, constants and functions that are complementary to those defined for EPON Multipoint MAC Control but that are unique to EPoC. These are listed in Table 103-1."

Add Table 103-1 as shown in remein_3bn_17_0515.pdf pg 1

{see related comments on fecOffset pg 283 ln 27 and IdleGapCount pg 283 ln 37}

Response Response Status C

See Related Cmt# 3429, 3363, & 3421

Comment Type T  Comment Status A  Rev

There are no substantive differences between Cl 103.2/103.2.1/103.2.1.1/103.2.2 and the corresponding subclauses of Cl 77. We should avoid duplication between these clauses where possible.

Suggested Remedy

Replace the text of 103.2 with the following:

"As depicted in Figure 103-3, the Multipoint MAC Control functional block contains functions very similar to those found in Clause 77. In EPoC the CLT replaces the OLT and the CNU replaces the ONU. Significant differences are noted in the following sections."

Replace the text of 103.2.1 with the following:

"The principle of Multipoint MAC Control is the same as those described in 77.2.1 for EPON."

Replace the text of 103.2.1.1 with the following:

"The ranging and timing processes for EPoC are the same as those described in 77.2.1.1 for EPON."

Replace the text of 103.2.2 with the following:

"The purpose and high level functionality of multipoint transmission control is similar to those described in 77.2.2 for EPON. Detailed differences are noted in the definitions below and in Figure 103-9 through Figure 103-14.

Remove Figure 103-4-"Round trip time calculation".

RETAIN Figure 103-5-"Multipoint Transmission Control service interfaces" through . Figure 103-14-"CNU Control Multiplexer state diagram".

RETAIN sections 103.2.2.1 "Constants" through 103.2.2.7 "State diagrams".

Response Response Status C

ACCEPT.

Note: The keyword "shall" does not appear in the removed text.
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

**Comment Type E**

Comment Status A

Ed/TBD

Remove the following Editors Notes:

Pg Ln
279 41
282 53
285 25
287 7
292 52
294 1

**Suggested Remedy**

Per Comment

**Response**

Response Status: C

ACCEPT.

**Comment Type T**

Comment Status: A

Figure 103-7 still has a carry-over from TDD - "transmitAllowed(n)"

**Suggested Remedy**

Remove from:

Figure 103-7
Figure 103-13

Pg 285 In 12 change

"This variable is used to control PDU transmission at the CNU and at the CLT and is defined in 64.2.2.3."

to

"This variable is used to control PDU transmission at the CNU and is defined in 64.2.2.3."

**Response**

Response Status: C

ACCEPT.

**Comment Type E**

Comment Status: A

MAC_Control_type is defined in Cl 32 not 64.

**Suggested Remedy**

Change ref from 64.2.2.1 to 31.4.1.3

**Response**

Response Status: C

ACCEPT.

**Comment Type T**

Comment Status: A

TqSizeC is dependent on the data rate and cannot therefore be a constant.

**Suggested Remedy**

Move this definition to 103.2.2.3

Change "constant" to "variable"

Strike "VALUE: TBD"

**Response**

Response Status: C

ACCEPT.

**Comment Type E**

Comment Status: A

There are inconsistencies in how we are cross referencing variable in CL 103 when the variable is previously defined in EPON. For example data_rx is defined 4 times in the draft. Here the full definition is repeated and a cross reference provided to 64.2.2.3

Pg 299 In 46 is simply cross referenced to 64.2.2.3

Pg 309 In 49 is cross referenced to 103.2.2.3 as is the def on pg 314 In 25.

**Suggested Remedy**

For each variable that is identical to one defined in Cl 64 or 77:

For the 1st instance of the definition repeat the def and provide a cross reference to the earliest definition.

For all subsequent definitions internally cross reference to the first definition in Cl 103.

**Response**

Response Status: C

ACCEPT.
There are several defined items in Cl 103.2.2.x that are different between EPoC and EPON such as fecOffset. It would be a good idea to give these unique names.

This is true for:

- PgLn Variable: 283 fecOffset, 10 OctetsRemaining, 36 ReseBound, 285 CheckGrantSize(length), 287 packet_initiate_timer, 314 effectiveLength, 316 rndDlyTmr.

SuggestedRemedy

Globally change:
- fecOffset -> fecOffsetC (15 instances)
- OctetsRemaining -> OctetsRemainingC (3 instances)
- ReseBound -> ReseBoundC (4 instances)
- CheckGrantSize -> CheckGrantSizeC (3 instances)
- packet_initiate_timer -> packet_initiate_timerC (5 instances)
- effectiveLength -> effectiveLengthC (5 instances)
- rndDlyTmr -> rndDlyTmrC (3 instances)

Response ACCEPT.

See Related Cmt# 3429, 3363, & 3421

There are several defined item in Cl Cl 103.2.2.x that are identical to items defined elsewhere for EPON. For example IdleGapCount definition is identical to that in Cl 77.2.2.3.

This is true for:

- PgLn Variable (xRef): 283 35 IdleGapCount (Cl 77.2.2.3), 284 41 RTT (cl 64.2.2.3), 285 33 Opcode-specific function(opcode) (Cl 64.3.5.5), 286 43 select() (Cl 64.2.2.4), 286 48 SelectFrame() (Cl 64.2.2.4), 287 1 sizeof(sdu) (Cl 64.2.2.4), 300 26 pendingGrants (64.3.3.2), 310 3 mpcp_timeout (64.3.4.2), 310 14 report_timeout (64.3.4.2), 310 27 report_periodic_timer (64.3.4.4), 313 28 max_future_grant_time (64.3.5.1), 314 12 currentGrant (64.3.5.2), 314 36 gate_timeout (64.3.5.2), 314 41 grantList (64.3.5.2), 314 53 maxDelay (64.3.5.2), 315 8 nextGrant (64.3.5.2), 315 14 nextStopTime (64.3.5.2), 315 33 empty(list) (64.3.5.3), 315 36 InsertInOrder(sorted_list, inserted_element) (64.3.5.3), 315 42 IsBroadcast(grant) (64.3.5.3), 315 47 PeekHead(sorted_list) (64.3.5.3), 315 51 Random(r) (64.3.5.3), 316 1 RemoveHead(sorted_list) (64.3.5.3), 316 7 gntStTmr (64.3.5.4), 316 11 gate_periodic_timer (64.3.5.4)

SuggestedRemedy

Add to the descriptions: "as described in xxx" replacing xxx with the appropriate ref.

Response ACCEPT.

See Related Cmt# 3429, 3363, & 3421
<table>
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<tr>
<th>Cl 103</th>
<th>SC 103.2.2.4</th>
<th>P 285</th>
<th>L 36</th>
<th># 3356</th>
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<td>Given that this only applies to MAC Control and that time in PHY is seen as distance there is no reason these TBDs cannot be the same as in EPON. In Cl 77 these two TBD's are both 1024 (i.e., 16.384 us).</td>
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<td>Change both TBD's to 1024 (i.e., 16.384 us).</td>
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<tr>
<td>In numerous figures &quot;RFOnTime&quot; should be &quot;rfOnTime&quot;</td>
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<td>The definition of pendingGrants is identical to that in 64.3.3.2.</td>
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<td>Append to the description &quot;and is defined in 64.3.3.2.&quot;</td>
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</table>
| Change the description of the syncTime variable to "This variable holds the time required to stabilize an EPON receiver at the OLT (see 76.3.2.5.3 and 77.3.3). The EPoC CLT OFDMA receiver is synchronized and stabilized during PHY Discovery and does not use a synchronization preamble as part of the upstream burst (see 101.3.2.5.3). This variable is present to maintain compatibility with the EPON MPCP. VALUE: 0"
| Line 44: delete Editors note. |
| SuggestedRemedy | | |
| As per comment. |
| Response | Response Status | C |
| ACCEPT IN PRINCIPLE. |
| Per commnet but last sentence to read: "This variable is present to maintain compatibility with the EPON MPCP and always has a value of zero in EPoC PHYs." |
Comment Type: T, Comment Status: A

There are no substantive differences between Cl 103.3/103.3.1/103.3.2 and the corresponding subclauses of Cl 77, with some exceptions. We should avoid duplication between these clauses where possible.

Suggested Remedy:
Replace the text of 103.3 with the following:
"As depicted in Figure 103-3, the Multipoint MAC Control functional block comprises nearly the same functions and layering system as that described in 77.3. In EPoC the CLT replaces the OLT and the CNU replaces the ONU. Significant differences are noted in the following sections.

103.3.1 Principles of Multipoint Control Protocol
The principles of the Multipoint Control Protocol are the same as those found in 77.3.1 except the EPoC system uses an Orthogonal Frequency Division Multiple Access (OFDMA) method in the upstream direction. In EPoC the Multipoint Control Protocol allows one and only one MAC is allowed to transmit at any given time. In EPoC the Multipoint Control Protocol allows multiple MACs to transmit in any given time but coincident transmitters are separated in frequency.

103.3.2 Compatibility considerations
103.3.2.1 PAUSE operation
See 77.3.2.1

103.3.2.2 Optional Shared LAN emulation
Optional Shared LAN emulation for EPoC is the same as described in 77.3.2.2 except the specific behavior of the filtering layer at the RS is specified in 101.2.4.3.

103.3.2.3 Multicast and single copy broadcast support
Multicast and single copy broadcast support in EPoC is the same as described in 77.3.2.3 except the configuration of SCB channels as well as filtering and marking of frames for support of SCB is defined in 101.2.4.3.*

RETAIN the text of 103.3.2.4 Delay requirements as is.

Replace the text of 103.3.3 with the following:
"Discovery processing in the EPoC system is largely the same as in the EPON system with the following exceptions. In the EPoC system CNU's that have not completed PHY Discovery process (see 102.4.1) will not respond to Discovery GATE MPCPDUs. In the EPoC coax cable distribution network only one upstream data rate is allowed for a given configuration. The laserOnTime and laserOffTime parameters of EPON are replaced in EPoC with rfOnTime and rfOffTime, respectively."

Remove Figure 103-15

Replace the text in 103.3.4 with the following:
"Gate processing in EPoC is as described in 77.3.4 with the exception being that EPoC used an RF transmitter rather than a laser."

Replace the text of 103.3.6 with the following:
"MPCDU structure and encoding in EPoC is as described in 77.3.4 with the exceptions noted below."

Replace the text of 103.3.6.1 with the following:
"The GATE used in EPoC is the same as used for EPON with the following exceptions. In EPoC rfOnTime and rfOffTime replace laserOnTime and laserOffTime, respectively. The 16-bit Discovery Information register described in 77.3.6.1 is not used in EPoC; all bits in this register are reserved and ignored on reception."

Replace the text of 103.3.6.2 with the following:
"The REPORT description for EPoC is identical to that of EPON."

Response Status: C
ACCEPT IN PRINCIPLE.
See response to Cmt# 3423

Suggested Remedy:
Move minGrantLength to 103.3.5.2 Variables. Adopt new definition as in laubach_3bn_16_0515.pdf

Suggested Remedy:
As per comment.

Response Status: C
ACCEPT.
Comment Type: T  Comment Status: A  Ed/TBD

BurstOverhead definition needs to be aligned with EPoC burst overhead.

“This variable represents the burst overhead and equals the sum of rfOnTime, rfOffTime, syncTime and an additional (TBD) time_quanta to account for END_BURST_DELIMITER and two leading IDLE vectors of the payload. This variable is expressed in units of time_quanta.”

Suggested Remedy

Change to read:

“This variable represents the burst overhead and equals the sum of rfOnTime, rfOffTime, syncTime, Start Marker, End Marker and two leading IDLE vectors of the payload. This variable is expressed in units of time_quanta.”

Response  Response Status: C

ACCEPT IN PRINCIPLE.

Change to read:

“This variable represents the burst overhead and equals the sum of BurstTimeHeader and two leading IDLE vectors of the payload. This variable is expressed in units of time_quanta.”

Comment Type: T  Comment Status: A  Ed/TBD

In definition of macDelay REGISTER_REQ is incorrect in the following sentence: This delay is calculated such that the CNU would have sufficient time to transmit the REGISTER_REQ message and its associated overhead (FEC parity data, end-of-frame sequence, etc.) and terminate the RF before the end of the discovery grant.

Suggested Remedy

Change REGISTER_REQ to REGISTER (as in 64.3.5.2 & 77.3.5.2)

Response  Response Status: C

ACCEPT IN PRINCIPLE.

Cl 45  SC 45.2  P 27  L 5  # 3452  Remein, Duane  Huawei

Comment Type: E  Comment Status: A  Ed/TBD

“EDITORS NOTE (to be removed prior to publication): the figure above “Gate Processing CNU Programing state diagram” will require modification if sub-clause 10x.4 “Discovery Process in dual-rate systems” is removed.”

However some ONUs are single rate (10G) and this SD seems to work fine for them. Therefore I must conclude that it works fine even with the removal of 10x.4 Discovery Process in dual-rate systems.

Suggested Remedy

Remove the Ed Note.

Response  Response Status: C

ACCEPT.

Cl 45  SC 45.2  P 29  L 33  # 3350  Remein, Duane  Huawei

Comment Type: E  Comment Status: A

Change per remein_3bn_13_0515.pdf

(on behalf of P Anslow, see anslow_3bn_01_0515.pdf)

Suggested Remedy

per comment

Response  Response Status: C

ACCEPT.
The description of CRC40 Errors in Table 45-98a does not match the behavior described in the accompanying text.
1 = CRC40 Errored frames are passed to the MAC layer without error indication
0 = CRC40 Errored frames are passed to the MAC layer using an error indication

Suggested Remedy
Change to:
1 = CRC40 Errored frames are passed with all sync headers set to <1,1>
0 = CRC40 Errored frames are passed as received

Pg 38 ln 30 add "and as describe in 101.3.3.1.4" to end of para in section 45.2.1.131.2

CRC40 Errors (1.1900.2)

Some entries have range of values and corresponding bit mapping, some do not

Suggested Remedy
Add values and bit mapping to RB size and Rnd

ACCEPT IN PRINCIPLE.

Rdn is an 8-bit integer and would not normally be "mapped"
For RB size change description to:
1 = 16 OFDMA symbols in the upstream OFDMA Resource Block
0 = 8 OFDMA symbols in the upstream OFDMA Resource Block

Perform a similar change for:
1.1901.15 CLT tx mute
1.1910.11 US copy in process
1.1910.10 US profile copy
1.1910.3 DS copy in process
1.1910.2 DS profile copy
12.10240.3 MER measurement
valid

Remove the Ed Note pg 201 ln 8

Pg 201 ln5: Typo - in line 5 "Type 1Start" s/b "Type2Start"
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Comment Type: E  Comment Status: A  PICS: Ed/TBD

From Pg 158 In 48: EDITORS NOTE (to be removed prior to publication): the above definitions were copied from those in Cl 45. We should probably keep these as reference from Cl 45 rather than keep both.
Modify the definition in Cl 45.

Suggested Remedy:
Pg 45 in 21 Change
Change 45.2.1.137.1 US copy in process (1.1910.3) from:
"When read as a one bit 1.1910.3 indicates that a copy of the currently active upstream profile to the inactive profile is in process. Note that while this variable has a value of one writes to all upstream profile variables shall be ignored and switching between profiles is prohibited. This register bit is a reflection of the variable US_CpyInP defined in 101.4.1.1.1.
To:
"When read as a one, bit 1.1910.11 indicates that a copy of the currently active upstream profile to the inactive profile is in process, writes to all upstream profile variables are ignored, and switching between profiles is prohibited. This bit is a reflection of the variable US_CpyInP defined in 101.4.1.1.1."

Change 45.2.1.137.2 US profile copy (1.1910.2) from:
"When bit 1.1910.2 is set to one a copy of the currently active upstream profile to the inactive profile is initiated. Once initiated this action continues to completion (i.e., it cannot be interrupted or aborted once initiated). These register bits are a reflection of the variable US_PrflCpy defined in 101.4.1.1.1.
To:
"When bit 1.1910.10 is set to one, a copy of the currently active upstream profile to the inactive profile is initiated and will continue to completion. This bit is a reflection of the variable US_PrflCpy defined in 101.4.1.1.1."

Change 45.2.1.137.4 DS copy in process (1.1910.3) from:
"When read as a one bit 1.1910.3 indicates that a copy of the currently active downstream profile to the inactive profile is in process. Note that while this variable has a value of one writes to all upstream profile variables shall be ignored and switching between profiles is prohibited. This register bit is a reflection of the variable DS_CpyInP defined in 101.4.1.1.1.
To:
"When read as a one, bit 1.1910.3 indicates that a copy of the currently active downstream profile to the inactive profile is in process, writes to all upstream profile variables are ignored, and switching between profiles is prohibited. This bit is a reflection of the variable DS_CpyInP defined in 101.4.1.1.1."

Change 45.2.1.137.5 DS profile copy (1.1910.2) from:
"When bit 1.1910.2 is set to one a copy of the currently active downstream profile to the inactive profile is initiated. Once initiated this action continues to completion (i.e., it cannot be interrupted or aborted once initiated). These register bits are a reflection of the variable UDS_PrflCpy defined in 101.4.1.1.1.
To:
"When bit 1.1910.10 is set to one, a copy of the currently active downstream profile to the inactive profile is initiated and will continue to completion. This bit is a reflection of the variable UDS_PrflCpy defined in 101.4.1.1.1."

"When bit 1.1910.2 is set to one, a copy of the currently active downstream profile to the inactive profile is initiated and will continue to completion. This bit is a reflection of the variable UDS_PrflCpy defined in 101.4.1.1.1."

Remove the Ed Note pg 158 ln 48
Response  Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A

This statement made sense when the bit definition was in Reg 12.1.3.0 but now that the enumeration is in Cl 101 it doesn't.
"See registers 12.1.3 through 12.1.0 for interpretation of individual bits."

Suggested Remedy:
Strike the statement in 4 places in 45.2.7a.2.x
Strike the similar phrase in 3 places in 45.2.7a.3.x
Response  Response Status: C
ACCEPT.
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Draft 1.4

Comment Type E
Comment Status A
Pg 208 line 13: "EDITORS NOTE (to be removed prior to publication): the above definition are essentially copies from CI 45.2.7a.3. Recommend keeping this and referencing this from CI 45."

SuggestedRemedy
Change 45.2.7a.4.1 and 45.2.7a.4.2 from:

45.2.7a.4.1 Real pre-equalizer coefficient SC(0) (12.2048.15:0)
Register bits 12.2048.15 through 12.2048.0 specify the real part of the pre-equalizer coefficient for subcarrier 0 for the US OFDMA channel. The number is a Q2.14 format signed fractional number. This register is a reflection of the variable EQ_CoefR(0) defined in 101.4.3.11.2.

45.2.7a.4.2 Imaginary pre-equalizer coefficient SC(0) (12.2049.15:0)
Register bits 12.2049.15 through 12.2049.0 specify the imaginary part of the pre-equalizer coefficient for subcarrier 0 for the US OFDMA channel. The number is a Q2.14 format signed fractional number. This register is a reflection of the variable EQ_CoefI(0) defined in 101.4.3.11.2.

To:

45.2.7a.4.1 Real pre-equalizer coefficient SC(0) (12.2048.15:0)
Register bits 12.2048.15 through 12.2048.0 specify the real part of the pre-equalizer coefficient for subcarrier 0 for the US OFDMA channel. This register is a reflection of the variable EQ_CoefR(0) defined in 101.4.3.11.2.

45.2.7a.4.2 Imaginary pre-equalizer coefficient SC(0) (12.2049.15:0)
Register bits 12.2049.15 through 12.2049.0 specify the imaginary part of the pre-equalizer coefficient for subcarrier 0 for the US OFDMA channel. This register is a reflection of the variable EQ_CoefI(0) defined in 101.4.3.11.2.

Removed Ed Note pg 208 In 13

Response
ACCEPT.

Comment Type ER
Comment Status A
Line 26: add editing directive before third paragraph: *
"Change the third paragraph as shown below."

Line 29: Make the reference to Figure 56-4a a cross reference.

Line 38: make ref to CL 100 a cross reference.

Line 43: change "a new paragraph" to "two new paragraphs"

Line 50: lower case words before "(ODN)"

SuggestedRemedy
ACCEPT.

Response
ACCEPT.

Comment Type ER
Comment Status A
Line 49, insert "CCDN coax cable distribution network" before CLT line.

SuggestedRemedy
ACCEPT.

Comment Type ER
Comment Status A
Line 49, insert "CCDN coax cable distribution network" before CLT line.

SuggestedRemedy
ACCEPT.

Response
ACCEPT.

Comment Type ER
Comment Status A
Change "PR-type" to "XR-type" in PMD box., Same for Line 41.

SuggestedRemedy
ACCEPT.

Response
ACCEPT.
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Laubach, Mark
Broadcom

Comment Type ER  Comment Status A

Line 7, add cross ref for Figure 56-4a
Line 18, add cross ref for Clause 76 and Clause 101
Same for line 28.
Line 37-38, add cross refs for Clauses 100-103.
Line 40, delete "(as modified by IEEE Std 802.3bk-2013)"

SuggestedRemedy

ACCEPT.

--

Laubach, Mark
Broadcom

Comment Type ER  Comment Status A

In Table 56-1, change tag to XREF for all "60" and "75".

Change references to "100" to cross references.

SuggestedRemedy

Changed color to forest green as a remedy.

ACCEPT IN PRINCIPLE.

Change character Tag to "External" and the color will be set appropriately.

Laubach, Mark
Broadcom

Comment Type ER  Comment Status A

Change editing directive "Change Table 56-3 as follows" to "Change Table 56-3 as follows to add the four right most new columns for Clauses 100, 101, 102, and 103.

SuggestedRemedy

ACCEPT.

Laubach, Mark
Broadcom

Comment Type ER  Comment Status A

In editing directive, delete "(as modified by IEEE Std 802.3bk-2013)"

SuggestedRemedy

ACCEPT.

Delete subclause 67.2.3a and the following italicized text on line 18-20. No example topologies have been accepted by TF consensus.

SuggestedRemedy

As per comment.

Laubach, Mark
Broadcom

Comment Type ER  Comment Status A

SuggestedRemedy

ACCEPT.

Laubach, Mark
Broadcom

Comment Type ER  Comment Status A

SuggestedRemedy

ACCEPT. 
IEEE 802.3bn EPON Protocol over Coax (EPoC) TF 4th Task Force review comments

Final Responses

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<th>P 72</th>
<th>L 28</th>
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<td>&quot;defines physical layer specifications and management parameters for the operation of Ethernet Passive Optical Networks (EPON) Protocol over coaxial media.</td>
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<td>&quot;Ethernet Passive Optical Networks (EPON), EPON Protocol over Coax (EPoC), Multi-Point MAC Control (MPMC), orthogonal frequency division multiplexing (OFDM), Physical Coding Sublayer (PCS), Physical Media Attachment (PMA), Physical Medium Dependent (PMD), PON, Point to Multipoint (P2MP), Reconciliation Sublayer (RS)&quot;</td>
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<td>&quot;This amendment adds physical layer specifications and management parameters for symmetric and/or asymmetric operation of up to 10 Gb/s on point-to-multipoint Radio Frequency (RF) distribution plants comprising either amplified or passive coaxial media. It also extends the operation of Ethernet Passive Optical Networks (EPON) protocols, such as Multipoint Control Protocol (MPCP) and Operation Administration and Management (OAM),&quot;</td>
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TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line