Meeting Minutes

Group: IEEE P802.3ca 100G-EPON Task Force

Event: Orlando meeting

Date: **From**: 11/6/2017 **To**: 11/8/2017

Location: Orlando, FL USA

Opening

11/6/2017 1:05 PM Opening

The meeting was called to order by the Chair, Curtis Knittle. Duane Remein volunteered to serve as recording secretary. The Chair held Introductions and gave the opening report.

Note: date/time above some motions indicate time vote was recorded.

Motion #1
Approve the agenda for November 6-8 2017 Task Force meeting as shown in file http://www.ieee802.org/3/ca/public/meeting_archive/2017/11/agenda_3ca_1_1117.pdf
Moved: Eugene Dai   Second: Bill Powell
Technical (≥ 75%)   Motion Passed by voice without opposition

Motion #2
Approve the Minutes for Task Force meeting held September, in Charlotte, NC USA located in file http://www.ieee802.org/3/ca/public/meeting_archive/2017/09/minutes_unapproved_3ca_0917.pdf
Moved: Marek Hajduczenia   Second: Alan Brown
Procedural (> 50%)   Motion Passed by voice without opposition

The chair reviewed the Task Force Web site / password, IEEE rules, and the IEEE patent policy.

11/6/2017 1:20 PM The chair made a call for patents, no response was made.

The Chair reviewed the IEEE Participation guidelines and process. Future meeting polls were taken. The WG chair commented on the Task Force progress noting that our CSDs would need to be modified at some point to allow us to proceed with a 50G serial solution. He also noted that we are due to complete baseline decision making by the March 2018 meeting (in two meetings after this meeting).

Presentations

All presentations are in the following format:

Title	Presenter	Affiliation

Comments
FileRef

FEC Proposal for NGEPON - update   Mark Laubach   Broadcom
This presentation proposed an alternative FEC code LDPC(18493,15677) with slightly improved performance. This code includes puncturing and shortening. It was mentioned during discussions that, for 20 km fiber latency will be at least 100 us due to propagation delay alone.
laubach_3ca_1a_1117.pdf

FEC Choices for 802.3ca   Eugene Dai   Cox Communications
This presentation suggested that an RS FEC would be preferable given latency considerations for a 50G PAM4 whereas 25G NRZ would be better served with an LDPC FEC. It was noted that 50G PAM4 serial is not part of our approved baseline.
dai_3ca_2_1117.pdf

Clarifications on LDPC   Gaobo   Huawei Technologies
This presentation rebutted several issues noted in bonk_3ca_1_1117.pdf including latency and shortening performance.
gao_3ca_2_1117.pdf

LDPC Code Length Reduction   Rene Bonk   Nokia
This presentation examined puncturing and shortening of LDPC FEC codes. Conclusions were that:
1) puncturing is difficult and limited to ~20% at best and
2) shortening causes increased inefficiencies.
It was pointed out that the LDPC FEC code proposed by Broadcom was not designed for puncturing, also as PONs become busy, grant times tend to increase which increases efficiency (i.e., inefficiencies are only seen in PONs that are not busy, so efficiency is of little concern).
bonk_3ca_1_1117.pdf

11/6/2017 3 AM   Break, reconvened 3:30 PM

CDR locking and Error distribution at high BER for 25 Gb/s
        Vincent Houtsma   Nokia
This presentation examined upstream error characteristics in PON systems and CDD lock. It was suggested that these need careful design/study.
houtsma_3ca_2_1117.pdf

FEC Selection for 25G/50G/100G EPON   Bill Powell   Nokia
This presentation examine minimum burst size versus FEC code word size.
powell_3ca_1b_1117.pdf

MLID assignment   Duane Remein   Huawei Technologies
This presentation suggested a mechanism to assign the MLID value during the registration (Discovery) process.
remein_3ca_1b_1117.pdf

Channel management   Gaobo   Huawei Technologies
The presentation suggested a mechanism for PMD channel control and reporting using REGISTRATION and REGISTER ACK messages
gao_3ca_1_1117.pdf

11/6/2017 4:50 PM   Recessed

11/7/2017 9:05 AM   Reconvened

Channel capability report during registration for 100G-EPON
                                                        Junwen Zhang   ZTE Corporation
The presentation suggested two mechanisms for PMD channel capability, control, and reporting. One would use REGISTRATER_REQ and REGISTER ACK and the second method would use eOAM to determine PMD channel capability.
zhang_junwen_3ca_2_1117.pdf

Straw Poll #1
Which channel capability reporting method is preferred? 1) Modify MPCP capability during registration 2) Get the capability by eOAM after registration 3) do not care For 1:   14 For 2:   3 For 3:   9

Latency Consideration for LDPC FEC Code   Jun Shan Wey   ZTE Corporation
This presentation examined latency of FEC codes under consideration.
wey_3ca_1a_1117.pdf

Migration Paths to 25G EPON, 50G, 100G EPON and Wavelength Plans
                                                        Eugene Dai   Cox Communications
This presentation considered PON migration and its impact on the wavelength plan.
dai_3ca_1a_1117.pdf

11/7/2017 10:50 AM   Break, reconvened 11:17 PM

Discussion on directions of standardization   Dezhi Zhang   China Telecom
This presentation suggested removing 100G from our objectives, select one solution for 50G (either 2x25 or 1x50). If a single solution for 50G cannot be agree in a reasonable timeframe then it also can be removed from the project.
zhang_dezhi_3ca_1a_1117.pdf

Comments on current wavelength plans   Dezhi Zhang   China Telecom
This presentation reviewed some possible migration and coexistence scenarios with 25G and 50G EPON solutions.
zhang_dezhi_3ca_2a_1117.pdf

11/17/2017 12:05 PM   Broke for lunch. Reconvened at 1:25 PM

Upstream wavelength plans for 50G, 100G   Ed Harstead   Nokia
This presentation suggested adding a wavelength at ~1290 to support a 2x25G + 1x50G solution for 100G. Also allowed would be 2x25G (1270+1290 or 1290+1310) and a 1x50G for 50G solutions and 2 different 1x25G solutions (1270 & 1310). The channel at ~1290 would never support a standalone 25G PON.
harstead_3ca_1_1117.pdf

TDEC, OMA and TDP Evaluation for 25G EPON
                                Vincent Houtsma   Nokia
This presentation examined an alternative method (transmitter dispersion eye closure, TDEC) of specifying the optical budget which avoids use of transmitter dispersion penalty (TDP). This method does not require an ideal transmitter and is thus easier to test. Unfortunately this method may not be completely valid for APD based receivers.
houtsma_3ca_1_1117.pdf

Power Budget of 25G-EPON Upstream   Daisuke Umeda   Sumitomo Electric
This presentation compared optical budget for the two wavelengths the TF has approved (1270 & 1310). The author suggests specifying a high power / low TDP transmitter paired with an APD for the single 25G system. For the 2x25G case it is suggested to specify a high power low / TDP transmitter paired a SOA/pin combination to overcome mux/demux losses. It may also be desirable to specify an "Extinction Ratio penalty".
umeda_3ca_1_1117.pdf

25G PON upstream power budget analysis   Dekun Liu   Huawei Technologies
This presentation examined cooled vs uncooled DMLs and concluded use of an uncooled DML is feasible.
liu_3ca_1a_1117.pdf

11/7/2017 3:10 PM   Break, reconvened at 3:40 PM

Upstream wavelength-dependent power budgets
                                Ed Harstead   Nokia
This presentation suggested trading off a narrower ~1310 nm channel, dispersion variance between 1300 and 1320, and a less stringent filter requirement.
harstead_3ca_2a_1117.pdf

Channel Control Protocol   Glen Kramer   Broadcom
This presentation suggested a control protocol for PMD channel management.
kramer_3ca_1_1117.pdf

25G_50G dual rate channels   Dekun Liu   Huawei Technologies
This presentation, previously reviewed on an ad hoc call, suggested that dual rate (25/50G) PHY was technically feasible.
liu_3ca_3_1117.pdf

Experimental Results of Single Wavelength 50G PON

                                 Junwen Zhang   ZTE Corporation
This presentation reviewed experimental results on 50G serial channels. Compared to a 25G NRZ / APD solution, PAM-4 has about a 7dB penalty @1e-3, and 5.5dB penalty @1E-2. Compared to 25G NRZ / APD solution, 50G NRZ has about a 4dB penalty and 50G EDB has 4-5dB penalty. An optical amplifier will be required at either the transmitter or receiver. Challenges include optical link budget, cost, and burst mode receiver.
zhang_junwen_3ca_1_1117.pdf

11/7/2017 5:25 AM   Recessed for the day.

11/8/2017 9 AM   Reconvened

Single-lambda 50G-EPON wavelength plan   Hanhyub Lee   ETRI
This presentation suggested a single wavelength (in C-band or S-band) 50 Gbps option.
lee_3ca_1_1117.pdf

50G single wavelength PON analysis and comparison

                                 Dekun Liu   Huawei Technologies
This presentation showed economic and technical feasibility (simulation & experimental) of 50G single channel PON and suggested a wavelength plan (~1270 & ~1310 US) with two optional up stream channels and proposed an optical budget (6.5 dB Tx & -25 dB Rx).
liu_3ca_2_1117.pdf

Multi-rate as a Path forward for 25/50/100GE-PON

                                 Frank Effenberger   Huawei Technologies
This presentation suggested a compromise on 25G vs 50G where a link with sufficient margin can operate at 50G and a link with low margin can operate at 25G and thus operate at a less stringent optical budget.
effenberger_3ca_1_1117.pdf

11/8/2017 10:50 AM   Break, Reconvened at 11:41:17 AM

Motion #3

Replace the contents of Clause 143 in the draft with that shown in remein_3ca_3_1117.pdf (include the definition of MPRS channel in Clause 1.4 Definitions).

Moved: Duane Remein   Second: Glen Kramer

For: 27   Against: 0   Abstain: 2

Technical (≥ 75%)   Motion Passed

11/8/2017 11:46 AM

Motion #4

Move to adopt MLID value assignment mechanism and MPCPDU format proposed in remein_3ca_1_1117.pdf slide 4 & 5.

Moved: Duane Remein   Second: Glen Kramer

For: 29   Against: 0   Abstain: 3

Technical (≥ 75%)   Motion Passed

11/8/2017 12:23 PM

Motion #5

Move to adopt LDPC FEC in the downstream direction with PON-wide precoding (differential encoding). Precoding is mandatory for implementation but optional for use. The ONU shall autodetect precoding.

Moved: Bill Powell   Second: Glen Kramer

For: 21   Against: 2   Abstain: 9

Technical (≥ 75%)   Motion Passed

12:23 AM   Recessed for lunch. Reconvened at 1:36 AM

Straw Poll #2

Do you agree to remove 50G and above from the current objectives?

Yes: 7
No: 14
Abstain: 8

11/8/2017 1:46 PM

Motion #6

Adopt for the LDPC FEC for the downstream channels:

- LDPC(18493,15677) 0.848 rate parity code matrix presented in laubach_3ca_1a_1117.pdf page 3, and
- the Omega256 structured interleaver presented in laubach_3ca_1_0517.pdf pages 10 and 11 with seed code as in laubach_3ca_2_0517.txt.

Moved: Mark Laubach   Second: Duane Remein

For: 23   Against: 2   Abstain: 4

Technical (≥ 75%)   Motion Passed

11/8/2017 2:07 PM

Motion #7
Modify MPCP to get the channel capability during registration process as shown in zhang_junwen_3ca_2_1117.pdf page 7. Moved: Junwen Zhang   Second: Bo (Heaven) Gao For: 7   Against: 9   Abstain: 13 Technical (≥ 75%)   Motion Failed

11/8/2017 2:26 PM

Motion #8
1. Channel Control Protocol (CCP) shall use MAC Control messages. 2. Two CCPDU shall be defined: • CC_REQUEST sent by the OLT to query and configure channels in an ONU • CC_RESPONSE sent by an ONU in response to CC_REQUEST to inform the OLT of the state of each channel and the result of the last configuration action. Moved: Glen Kramer   Second: Frank Effenberger For: 20   Against: 1   Abstain: 7 Technical (≥ 75%)   Motion Passed

Motion #9
Remove "100 Gb/s in downstream and less than or equal to 100 Gb/s in upstream" from P802.3ca 100G-EPON Task Force objectives. Moved: Dekun Liu   Second: Phil Miguelez

11/8/2017 3:01 PM

Motion #10
Move to Table motion #9 Moved: Glen Kramer   Second: Marek Hajduczenia For: 6   Against: 17   Abstain: 6 Technical (≥ 75%)   Motion Failed

11/8/2017 3:04 AM   Recessed for Break, reconvened at 3:30PM

The TF has resumed discussion on Motion #9.

11/8/2017 3:49 PM

Motion #11
Move to Call motion #9 Moved: Kevin Noll   Second: Ed Walter For: 21   Against: 0   Abstain: 7 Procedural (> 50%) Motion Passed

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Motion #9

Remove "100 Gb/s in downstream and less than or equal to 100 Gb/s in upstream" from P802.3ca 100G-EPON Task Force objectives.

Moved: Dekun Liu   Second: Phil Miguelez

For: 21   Against: 3   Abstain: 6

Technical (≥ 75%)   Motion Passed

11/8/2017 4:24 PM

Motion #12

2x25G -EPON shall WDM coexist with 10G-EPON, i.e., the second upstream channel (US1) in any 2x25G EPON shall not re-use one of the two options for 25G US0 (US0-B and US0-A).

Moved: Ed Harstead   Second: Ed Walter

For: 16   Against: 4   Abstain: 7

Technical (≥ 75%)   Motion Passed

11/8/2017 4:43 PM

Motion #13

Referring to harstead_3ca_2a_1117.pdf, 20 nm spectrum will not be allocated for uncooled lasers for the 25G upstream wavelength option around 1310 nm. Less spectrum will be allocated to enable optimization of optical filtering and dispersion penalty.

Moved: Ed Harstead   Second: Phil Miguelez

For: 9   Against: 10   Abstain: 7

Technical (≥ 75%)   Motion Failed

Straw Poll #3

Is dual-rate TDM coexistence between 25G and 1x50G PON   in the upstream of interest (effenberger_3ca_1_1117)?

Yes: 8
No: 6
Don't know: 11

Straw Poll #4

Do you agree to adopt the wavelength plan and downstream power levels in page 10 & 14 in liu_3ca_2a_1117.pdf as the starting point for 50Gb/s single wavelength PON?

For: 8
Against: 9
Abstain: 8

Motion #14

IEEE P802.3ca Task Force instructs the Editor to produce draft version D0.6 from current draft version D0.5 by incorporating changes as recorded in motions approved during the November 2017 meeting.

Moved: Marek Hajduczenia   Second: Glen Kramer

For: 25   Against: 0   Abstain: 0

Technical (≥ 75%)   Motion Passed

11/8/2017 5:45 PM

Motion #15

Move that the P802.3ca Chair (or his appointed agent) request that the IEEE 802.3 Working Group approve IEEE_802d3_to_SG15_Q2_1117_draft.pdf with editorial license granted to the Chair (or his appointed agent) as liaison communication from the IEEE 802.3 Working Group to the ITU-T Q2/15.

Moved: Ed Walter   Second: Marek Hajduczenia

Technical (≥ 75%)

Motion Passed by voice without opposition

11/8/2017 6:01 PM

Motion #16

Serial 50G wavelength shall be removed from consideration by P802.3ca Task Force.

Moved: Glen Kramer   Second: Phil Miguelez

For: 8   Against: 6   Abstain: 8

Technical (≥ 75%)   Motion Failed

11/8/2017 6:08 PM

Motion #17

50G-EPON in P802.3ca shall only use a single wavelength in each direction.

Moved: Dekun Liu   Second: Glen Kramer

For: 6   Against: 11   Abstain: 7

Technical (≥ 75%)   Motion Failed

Straw Poll #5

Propose to keep 25G in the scope and move 50G (both 2x25G and 1x50G) to a new project.

For: 9

Against: 10

Abstain: 5

The chair reviewed upcoming joint workshop between P802.3ca and ITU-T Q2/15 in Geneva (Jan. 2018). The chair reviewed action items for future meetings.

Motion #18	
Move to adjourn	
Moved: Duane Remein	Second: Frank Effenberger
Procedural (> 50%)	Motion Passed by voice without opposition

11/8/2017 6:37:25 PM Meeting was adjourned

Attendence

Full Name	Affiliation	6-Nov	7-Nov	8-Nov
Rene Bonk	Nokia / Nokia, Bell Labs	x	x	x
Alan Brown	Adtran	x	x	x
Ayla Chang	Huawei	x	x	x
Barry Colella	Source Photonics	x	x	x
Eugene Dai	Cox Communication		x	x
Claludio Desanti	Google	x	x	x
John Dickinson	Bright House Networks	x		
Liang Du	Google	x	x	x
Frank Effenberger	Huawei	x	x	x
Bo Gao	Huawei	x	x	x
Marek Hajduczenia	Charter	x	x	x
Yang Han	Broadcom Limited	x	x	x
Ed Harstead	Nokia / Nokia, Bell Labs		x	x
Vincent Houtsma	Nokia / Nokia, Bell Labs	x	x	x
Kazuhiko Ishibe	Anritsu	x		
Kenneth Jackson	Sumitomo	x		
John Johnson	Broadcom LTD.	x	x	x
Curtis Knittle	CableLabs	x	x	x
Glen Kramer	Broadcom LTD.		x	x
Mark Laubach	Broadcom LTD.	x	x	x
David Law	HPE	x		
Hanhyub Lee	ETRI	x	x	x
Dekun Liu	Huawei	x	x	x
Kevin Liu	AOI		x	x
Phil Miguelez	Comcast	x	x	x
Kevin Noll	Tibit Communication	x	x	x
Sebnem Ozer	Comcast	x	x	x
Pondillo Peter	Corning		x	x
Bill Powell	Nokia / Nokia, Bell Labs	x	x	x
Duane Remein	Huawei	x	x	x
Ken-Ichi Suzuki	NTT	x	x	x
Akio Tajima	NEC Corporation	x	x	

Full Name	Affiliation	6-Nov	7-Nov	8-Nov
Ryan Tucker	Charter	x	x	x
Daisuke Umeda	Sumitomo	x	x	x
Edward Walter	AT&T	x	x	x
Jun Shan Wey	ZTE Corp		x	x
Yu Xu	Huawei	x	x	
Shigeyaki Yanaginmach	NEC	x	x	
Junwen Zhang	ZTE Corp		x	x
Richard (Yujia) Zhou	Charter	x	x	x