# Meeting Minutes

**Group**: IEEE 802.3 100G-EPON Task Force

**Event**: Task Force Plenary meeting

**Date:** **From**: 7 November, 2016 **To**: 9 November 2016

**Location**: San Antonio TX USA

### 7 November 2016

**1:05 PM** – The meeting was called to order by the Chair. Duane Remein volunteered to serve as recording secretary. The Chair held Introductions and gave the opening report.

| **Motion #1** | |
|---|---|
| Approve the agenda for Task Force meeting to be held Nov 7-10 2016, in San Antonio TX located in file http://www.ieee802.org/3/ca/public/meeting_archive/2016/11/agenda_3ca_1a_1116.pdf | |
| Moved: Kevin Noll | Seconded: Alan Brown |
| Procedural > 50% | Passed by voice without opposition |

| **Motion #2** | |
|---|---|
| Approve the Minutes for Task Force meeting held September 2016, in Fort Worth TX located in file http://www.ieee802.org/3/ca/public/meeting_archive/2016/09/minutes_unapproved_3ca_1a_0916.pdf | |
| Moved: Duane Remein | Seconded: Dekun Liu |
| Procedural > 50% | Passed by voice without opposition |

The Chair reviewed meeting decorum, the Task Force reflector & web page, and IEEE Organization & Bylaws. The IEEE patent policy was read by the chair.

**1:26 PM** –A call for patents was made. No response was received.

The chair reviewed a liaison letter from BBF on low power modes for FTTdp. F. Effenberger volunteered to work on a response to this letter.

The chair noted that our timeline is out-of-date and needs to be updated. The Chair reviewed the IEEE process, goals for meeting, and future meeting (Huntington Beach Jan., Vancouver BC, Mar.) polls were taken.

## Presentations and Discussion

**1:30 AM –**Presentations

All presentation information is formatted as follows:
**Title** **Author/Presenter** **Affiliation**
Notes
file_name

**Passive Optical Technologies to Extend PON Reach**
**Alexander Umnov** **Corning**
This presentation reviewed two technologies which may enable extended PON reach; asymmetric splitters and Gires-Tornois Etalon dispersion compensation. The GTE device is a relatively low cost device that is being used for dispersion compensation in metro networks today.
umnov_3ca_1b_1116.pdf

**100G EPON coexistence issue discussion** **Dekun Liu** **Huawei Technologies**
This presentation highlighted two issues with coexistence of 25/10G-EPON if this system does not share the 25G-EPON wavelength. The first issues suggested that coexistence with 25/10G-EPON is mutually exclusive if a preamplifier is needed in the US 25G path at the OLT because an SOA will yield nearly zero gain for the 20 nm 10G wavelength. The second pointed out that a 10G optics capability will be needed at the 100G-EPON OLT for coexistence with 10/10 or 10/25G-EPON.
liu_3ca_3_1116.pdf

**Coexistence and Upgrade** **Dezhi Zhang** **China Telecom**
This presentation outlined the importance and magnitude of Opex to operators in several coexistence scenarios for 100G-EPON and derivative systems.
zhang_3ca_2a_1116.pdf

**TDM vs. WDM co-existence** **Ed Harstead** **Nokia**
This presentation reviewed cost, feasibility and impact of TDW vs WDM coexistence with 10G_EPON.
harstead_3ca_2a_1116.pdf

**100G APD ROSA sensitivity update** **Mengyuan Huang** **SiFotonics Technologies**
This presentation outlined test results for a GeSi 25G APD ROSA. Current result indicate a device with ~27 dBm is reasonable (including volume, end of life and temp range considerations).
huang_3ca_1a_1116.pdf

**Proposal of 25GBASE-PR30 downstream PMD parameter values**
**Hanhyub Lee** **ETRI**
This presentation proposed many PMD parameters for 100G-EPON.
lee_3ca_2a_1116.pdf

**Feasibility and economy analysis on 25G in C-band assisted with DSP**
**Dekun Liu** **Huawei Technologies**
This presentation outlined cost and flexibility of using DSP technology for dispersion compensation in C-band based PHYs for downstream.
liu_3ca_4_1116.pdf

**Measurement Results of 25G NRZ & EDB in C and O-band**
**Vincent Houtsma** **Nokia Bell Labs**
This presentation outlined results of optical sensitivity measurements of 25G GeSi APDs and compared O-Band and C-band characteristics. It was noted that the GeSi APDs tested were optimized for O-band reception.
houtsma_3ca_1_1116.pdf

**25G Receiver performance** **Naruto Tanaka** **Sumitomo Electric Industries, LTD**
This presentation outlined the impact of extinction ratio on receiver sensitivity for 25G APDs. Note that "vendor A APD" includes an optical demux. Also included was a proposed optical budget for a single channel 25G link (both US & DS).
tanaka_3ca_1_1116.pdf

**PR20 (24 dB) loss budget** **Ed Harstead** **Nokia**
This presentation reviewed and compared PR20 vs PR30 optical budgets.
harstead_3ca_1_1116.pdf

**5:40 PM** – recessed for the day.

## 8 November 2016

**9:00 AM** – reconvened, continued presentations.

**Enhanced FEC enables low-cost 25G EPON**
**Frank Effenberger** **Huawei Technologies**
This presentation reviewed several potential improved FECs that could be used for 100G-EPON.
effenberger_3ca_1_1116.pdf

**Four wavelength mixing Analysis in 100G-EPON wavelength plan**
**Dekun Liu** **Huawei Technologies**
This presentation outlined four wave mixing simulation results predicted on some wavelength proposals.
liu_3ca_1_1116.pdf

**Four Wave Mixing in Near Zero Dispersion Regions**
**Eugene Dai** **Cox Communications**
This presentation reviewed four wave mixing theory and its potential impact on some proposed wavelength plans.
dai_3ca_2a_1116.pdf

**Analysis of NG-EPON Diplexer Filtering**
**John Johnson** **Broadcom**
This presentation reviewed diplexer filter considerations for and impact on BOSA construction.
johnson_3ca_1a_1116.pdf

**Proposal of 100G EPON wavelength plan in O-band**
**Hanhyub Lee** **ETRI**

This presentation proposed a wavelength plan with all channels in the O-band. It was noted that the zero dispersion point of G.652 fiber types goes to 1300 nm not 1302 nm.
lee_3ca_1a_1116.pdf

**100G-EPON wavelength plan comparison Model Discussion and Optimization**
**Dekun Liu** **Huawei Technologies**
This presentation proposed a method to compare and contrast the various wavelength plans to assist in decision making.
liu_3ca_2_1116.pdf

**12:20 PM** – recessed for lunch, reconvened at 1:50 PM.

**Wavelength plan comparison update** **Ed Harstead** **Nokia**
This presentation outlined the results of the tool discussed in the Fort Worth meeting after several updates.
harstead_3ca_3_1116.pdf

**Simulation Study on 100G EPON Wavelength Plan A**
**Eugene Dai** **Cox Communications**
This presentation reviewed results of a simulation done on Wavelength plan "A".
dai_3ca_1_1116.pdf

**3:05 PM** – recessed for the day to allow interested individuals to participate in P802.3.2 task force.

## 9 November 2016

**9:00 AM** – reconvened.

**All O band Uneven Spacing Wavelength Plan for 100G EPON**
**Eugene Dai** **Cox Communications**
This presentation proposed several wavelength plans with all channels in the O-band. The primary objective of these plans is to avoid degenerate FWM interference.
dai_3ca_3a_1116.pdf

**Revision Suggestion for plan A** **Dezhi Zhang** **China Telecom**
This presentation proposed a variation of wavelength plan "A".
zhang_3ca_1_1116.pdf

**Updates to ONU MPRS state diagrams** **Glen Kramer** **Broadcom**
This presentation outlined several proposed improvements to the US channel bonding solution approved in the Fort Worth meeting.
kramer_3ca_1_1116.pdf

**GATE Processing at the ONU** **Glen Kramer** **Broadcom**
This presentation proposed methods and state diagrams for MPCP layer in the ONU for the upstream direction.
kramer_3ca_2_1116.pdf

**Multi-Point Reconciliation Sublayer (MPRS) — OLT receive path**
**Glen Kramer** **Broadcom**
This presentation proposed methods and state diagrams in the OLT for the upstream direction channel bonding solution approved in the Fort Worth meeting.
kramer_3ca_3a_1116.pdf

**12:15 PM** – recessed for lunch, reconvened at 1:45 PM.

**Downstream MPRS** **Duane Remein** **Huawei Technologies**
This presentation proposed methods and state diagrams in the OLT for the channel bonding solution in the downstream direction.
remein_3ca_1_1116.pdf

## Discussions, motions and straw polls

**Motion #3**
The 802.3ca standard shall specify that all 100G ONUs and OLTs use the same four wavelength pairs, one of which is the same wavelength pair as used by 25G ONUs and OLTs ("1+3" solution).
Moved: Phil Miguelez Seconded: James Zhang
For: 27 Against: 0 Abstain: 4
Technical ≥ 75% Passed

**Motion #4**
Adopt the modified state diagrams for ONU MPRS Input and Transmit Processes as presented in kramer_3ca_1a_1116.pdf.
Moved: Glen Kramer Seconded: Alan Brown
For: 26 Against: 0 Abstain: 5
Technical ≥ 75% Passed

**Motion #5**
Adopt the state diagrams for ONU MPCP Gate Reception Input and Envelope Activation Processes as presented in kramer_3ca_2a_1116.pdf.
Moved: Glen Kramer Seconded: Duane Remein
For: 26 Against: 0 Abstain: 3
Technical ≥ 75% Passed

**Motion #6**
Adopt the state diagrams for OLT MPRS Receive and Output processes as presented in kramer_3ca_3b_1116.pdf.
Moved: Glen Kramer Seconded: Duane Remein
For: 26 Against: 0 Abstain: 5
Technical ≥ 75% Passed

There was a discussion regarding the precise wavelength the Task Force should use for the minimum zero-dispersion point in fiber. It was suggested that information be provided on the zero-dispersion

point for deployed drop fiber cables. This may enable relaxing the ITU specification of 1300 nm to 1302 nm for this parameter. This in turn will allow better wavelength placement and spacing in this region for some plans under consideration without potential interference from FWM.

**Closing report**
The Task Force considered the current timeline.

| **Motion #7** | |
|---|---|
| Move to amend the timeline as shown in timeline_3ca_1116.pdf | |
| Moved: Dekun Liu | Seconded: Glen Kramer |
| Procedural > 50% | Passed by voice without opposition |

There was a short discussion regarding the submission deadline for contributions and their availability on the web site. It was agreed that the contribution deadline will remain the Monday before the meeting but a change to the submission script will be made to distribute all submissions via the reflector. Presentation authors are encouraged to distribute changes after the submission deadline to the project email reflector. The web master may also provide an early link to the file directory allowing participants to download presentations earlier in the week prior to the meeting.

There was additional discussion on how to progress the wavelength plan.

| **Motion #8** | | |
|---|---|---|
| To reduce the Four Wave Mixing penalty at high power, disallow any equally-spaced wavelength plan where more than one wavelength is located within the zero-dispersion range. | | |
| Moved: Frank Effenberger | Seconded: Dekun Liu | |
| For: 25 | Against: 0 | Abstain: 1 |
| Technical ≥ 75% | Passed | |

| **Motion #9** | |
|---|---|
| Move to Adjourn | |
| Moved: Duane Remein | Seconded: Mark Laubach |
| Procedural > 50% | Passed by voice without opposition |

**6:00 PM** The meeting was adjourned.

## Attendance

| Family Name | Given Name | Affiliation | 7-Nov | 8-Nov | 9-Nov |
|---|---|---|---|---|---|
| Brown | Alan | Adtran | X | X | X |
| Chang | Ayla | Huawei | | X | X |
| Chang | Frank | Inphi | | | X |
| Choudhing | G. Mabud | OFS | X | | |
| Colella | Barry | Source Photonics | | X | X |
| Dai | Eugene | Cox Communication | X | X | X |
| Doo | Kyeong-Hwan | ETRI | X | X | X |
| Effenberger | Frank | Huawei | X | X | X |
| Emmendorfer | Michael | Arris | X | X | X |
| Gong | Zhigang | O-Net | X | X | |
| Guo | Yong | ZTE Corp | X | X | X |
| Harstead | Ed | Nokia | X | X | X |
| Hong | Ching-yin | SiFotionics Technologies | X | X | X |
| Houtsma | Vincent | Nokia, Bell Labs | X | X | X |
| Huang | Mengyuan | SiFotionics Technologies | X | X | X |
| Johnson | John | Broadcom LTD. | X | X | X |
| Knittle | Curtis | CableLabs | X | X | X |
| Kramer | Glen | Broadcom LTD. | | X | X |
| Kusano | Toshikiko | Oliver Solutions | X | X | X |
| Laubach | Mark | Broadcom LTD. | X | X | X |
| Lee | Hanhyub | ETRI | X | X | X |
| Liu | Dekun | Huawei | X | X | X |
| Lokhandwala | Moiz | Charter / Time Warner Cable | X | X | X |
| Miguelez | Phil | Comcast | X | X | X |
| Noll | Kevin | Charter / Time Warner Cable | X | | |
| Parsons | Earl | CommScope | X | X | X |
| Peng | Wanquan | Huawei | X | X | X |
| Peters | Michael | Sumitomo | X | X | X |
| Powell | Bill | Nokia | X | X | X |
| Remein | Duane | Huawei | X | X | X |
| Suzuki | Haoki | Mitsubishi Electric | X | X | X |
| Suzuki | Ken-Ichi | NTT | X | X | X |
| Tanaka | Naruto | Sumitomo | X | X | X |
| Tucker | Ryan | Charter | X | X | X |
| Umnov | Alexander | Corning | X | X | X |
| Yu | Xu | Huawei | X | | |
| Zhang | Huanlin | Applied Opto Electronics Inc | | X | X |
| Zhang | James | China Telecom | X | X | X |