

Meeting Minutes

Industry Connections NG-EPON Activities ad-hoc.

Marek Hajduczenia, as acting Chair, called the meeting to order on Sun, Nov 2, 2014 at 13:01 PM. The Chair indicated that Edwin Mallette had volunteered to be recording secretary for the meeting. The Chair displayed the opening presentation starting with the agenda. Edwin Mallette volunteered to be recording secretary.

The attendees in the meeting room then introduced themselves with their affiliation, as per the agenda.

The chair asked if anyone had read the meeting minutes. Two people indicated in affirmative. The chair then asked if anyone had any objection to approving the meeting minutes. There was no objection. The chair indicated the meeting minutes from the September interim meeting were approved.

Chair displayed information on the reflector and web; ad hoc decorum; WiFi access information; ground rules. The chair then went over the NG-EPON IC project goals and current status. Draft version R08 has been distributed with comments received.

Duane Remein went to the microphone and indicated a request to thank our interim meeting host – Verizon – now that a participant with that affiliation, Martin Carrol, was present in the meeting room. NG-EPON IC participants thanked the meeting host.

The Chair stated that draft comment reviews would be done first, so Kevin Noll, editor, joined the Chair at the podium to go over the draft comments.

Draft Review

Title: [NG-EPON IC Report R08](#) (Private Area)

Presenter: Editor Kevin Noll

Affiliation: Time Warner Cable

Kevin Noll went over the draft report and the NG-EPON ad hoc added, reviewed, discussed, and resolved comments against the draft.

At 2:49PM Glen Kramer requested that we move from comment resolution to the presentation as there is about 3 hours of presentation material. The Chair indicated that we would get through the next five technical comments and then switch to presentations.

Approximately 40 comments were reviewed and proposed resolutions were provided.

At 2:56PM the Chair began to walk through the agenda.

Contribution #1:

Title: [Contribution on Power Budget](#)

Presenter: Marek Hajduczenia

Affiliation: Bright House Networks

Dr. Hajduczenia provided a contribution for power budgets, recommending it go into the draft in section 5.6.

Dr. Hajduczenia asked if there were any objections to this text being added to the draft. There were none.

Contribution #2:

Title: [Contribution on Outside Distribution Network](#)

Presenter: Marek Hajduczenia

Affiliation: Bright House Networks

Dr. Hajduczenia provided a contribution for outside distribution network, recommending it go into the draft in section 5.7.

Dr. Hajduczenia asked if there were any objections to the text being added to the draft. Mr. Remein recommended two changes – (1) to use “Optical Distribution Network” rather than “Outside Distribution Network” and (2) that the recommendation that the existing ODN elements not need to be replaced, to strike the clause that says they would not need to be requalified. Dr. Hajduczenia agreed on both counts. There were no additional change to the text.

Contribution #3:

Title: [Contribution on Taxonomy of Optical Network Technologies](#)

Presenter: Marek Hajduczenia

Affiliation: Bright House Networks

Dr. Hajduczenia provided an update to Section 3 in the draft on Taxonomy of Optical Network Technologies.

Dr. Kramer asked about the Figure 2 that Dr. Hajduczenia provided indicating that it was confusing what the blue boxes with lambda-1, lambda-2 in them represented. Dr. Hajduczenia agreed that he would remove the updated diagram and request an update of the source material of the diagram he was attempting to redraw.

There was a discussion about utilizing the language as defined in IEEE Std 1904.1 when discussing the OLT, ONU components - C-OLT, L-OLT. The general agreement

was that the use of IEEE Std 1904.1 language would make the components discussed unambiguous.

Dr. Kramer recommended simply changing the title to “Taxonomy of WDM-PON-based Access Network Technologies.” Per comments Dr. Hajduczenia changed “TDM” to “scheduling domain.”

The Chair called for break at 3:27PM for 20 minutes. The Chair called the meeting back to order at 3:49PM.

Contribution #4:

Title: [Contribution on Power Saving](#)

Presenter: Marek Hajduczenia

Affiliation: Bright House Networks

Dr. Hajduczenia provided a contribution for power saving, recommending it go into the draft in section 5.9.

Dr. Hajduczenia asked if there were any objections to this text being added to the draft. There were none.

Contribution #5:

Title: [Contribution on Bandwidth Consumption Trends](#)

Presenter: Marek Hajduczenia

Affiliation: Bright House Networks

Dr. Hajduczenia provided an update to Section 4.2 in the draft on Bandwidth Consumption Trends. He indicated that he made a number of changes requested at the September-2014 interim. He also indicated that he had the Sandvine permission on-file and that David Law has that correspondence.

Dr. Hajduczenia asked if there were any objections to this text being added to the draft. There were none.

Contribution #6:

Title: [Contribution on Economic Feasibility](#)

Presenter: Marek Hajduczenia

Affiliation: Bright House Networks

Dr. Hajduczenia provided a contribution for economic feasibility, recommending it go into the draft in section 7

Mr. Remein commented that the diagram depicting relative cost of 1G-ONU, 1G-OLT, 10G-ONU, 10G-OLT was difficult to understand. Dr. Hajduczenia indicated that he would correct the diagram by making everything reference the cost of a 1G-ONU in 2008.

Contribution #7:

Title: [Advanced modulation techniques for NG EPON: duobinary](#)

Presenter: Ed Harstead

Affiliation: Alcatel Lucent

Mr. Harstead defined duobinary modulation. He went on to mention that it reduces spectrum by half, is extremely simple to implement, and can provide 25Gb/s with 10Gb/s components in the ONU and 40Gb/s with 25Gb/s components in the ONU. Mr. Harstead stated that he found a few slides in errors and he highlighted in red the presented version such that its different than the version posted. He encouraged a consideration for an LDPC-based FEC as used in other recent IEEE802.3 projects, though he indicated that LDPC might not provide better error correction than RS for burst mode transmitters.

Mr. Harstead also walked through a couple experimental results for 25Gb/s and 40Gb/s and then possible co-existence options.

Contribution #8:

Title: [Contribution to Advanced Modulation](#)

Presenter: Ed Harstead

Affiliation: Alcatel Lucent

Mr Harstead provided an update to section 6.3 with a significant amount of new text.

The Chair indicated that he intended to accept this contribution to the draft, but indicate that it needed significant review. Dr. Kramer agreed to include duobinary to the report but wants to have considerable more discussion about bit interleaving before including that in the report.

There was a consideration from the floor that duobinary is pretty specific and there are other advance modulation techniques including PAM. Mr. Harstead indicated there were reasons they think duobinary is better but that doesn't mean these other techniques are not valid.

Contribution #9:

Title: [Offered bandwidth forecasting for NG EPON](#)

Presenter: Ed Harstead

Affiliation: Alcatel Lucent

Mr Harstead talked about the ranges of offered residential bandwidths and narrowed the ranges of offered bandwidth between 1Gb/s and 100Gb/s.. Then he shifted to a fourth methodology. Mr. Harstead posited that the reason the bandwidth of 1Gb/s service hadn't increased above 1Gb/s is because the home devices are limited to 1Gb/s until faster home devices are reasonably accessible.

Mr. Remein indicated that there is a copyright notice on the presentation and requested that the author remove it and republish.

Contribution #10:

Title: [Contribution to Conclusions](#)

Presenter: Duane Remein

Affiliation: Huawei

Mr. Remein provided a contribution for section 8 Conclusions.

Mr. Agata indicated that after more discussion they had changed their minds with regards to co-existence with EPON and that they think they do not need coexistence with EPON. There was a discussion from the floor with regards to coexistence and that not every operator wants every co-existence option.

The Chair asked if it would be fair to ask the contributor to update it before the next meeting. The consensus in the room was to discuss it on the reflector first and then on the conference call, once scheduled.

Contribution #11:

Title: [Proposal of Additional Wavelength Allocation Plan for NG-EPON](#)

Presenter: Akira Agata

Affiliation: KDDI R&D Laboratories

Mr. Agata proposed using a 1.3 μm -band as a candidate wavelength allocation to enhance the transmission rate more than 10Gbps/ λ . He also indicated that the changing requirements of fronthaul indicates that coexistence with 1G/2.5G PON might not be required because future fronthaul networks will be 10Gb/s or more.

Contribution #12:

Title: [Wavelength Plan Analysis](#)

Presenter: Duane Remein

Affiliation: Huawei

Mr. Remein provided a wavelength plan for consideration. He indicated that coexistence for 1G-EPON was likely, as was coexistence with RFoG, and listed concerns for use of O band for NGEPON upstream because FP lasers are continuing to be shipped for EPON. The conclusion is that the wavelength plan should be consistent with NGPON2.

Contribution #13:

Title: [NG-PON2 and RFoG wavelength overlaps](#)

Presenter: Bill Powel

Affiliation: Alcatel Lucent

Mr. Powell made a point to RFoG and NG-PON wavelength overlaps and generated a slide accordingly.

Meeting was adjourned for the day Nov 2, 2014. at 6:11PM. The Chair was to request the additional time for the ad-hoc on the following day, i.e., Monday morning and announce availability via email reflector.

Marek Hajduczenia, as acting Chair, reopened the meeting on Monday, the 3rd of November, 2014, at 9:00 am.

Discussion on the action items for the following interim meeting, as recorded in the report, as posted online: [NG-EPON AdHoc report](#).

Discussion on the interim meeting in January 2015. Two days non-overlapping with P802.3bn EPoC will be requested. Chair to submit the request to 802.3 WG Officers. Proposal for additional interim in February 2015, hosted by CableLabs and collocated with IEEE 1904 WG was submitted. The group agreed to explore this meeting proposal once the specific date and location is confirmed by the host. The NG-EPON IC members recognized the host for their proposal.

Discussion on the editorial plan for R09, as recorded in the report, as posted online: [NG-EPON AdHoc report](#). The Chair requested that all updated materials are provided for upload to the website and editable contributions are delivered to editors.

Contribution #14:

Title: [Seeking the Common Ground for FSAN/ITU-T NG-PON2 and IEEE NG-EPON](#)

Presenter: Eugene Dai

Affiliation: Cox Communications

Mr. Dai presented arguments in favor of alignment of PHY specifications between NG-EPON and NG-PON2, together with the different views on what specification alignment between both systems can achieve.

Contribution #15:

Title: [Wavelength Plan Proposal for NGEPON](#)

Presenter: Saif Rahman

Affiliation: Comcast

Mr. Rahman presented arguments in favor of alignment of PHY specifications between NG-EPON and NG-PON2, focusing on the coexistence with 1G-EPON, 10G-EPON, and RFoG.

Concerns were raised that the proposed alignment would make NG-EPON not compatible with certain deployments of RFoG using 1610nm upstream return channel, which contradicts the assumptions listed in the presentation. This topic will require further analysis in the future Task Force.

Contribution #16:

Title: [Meeting summary and path forward](#)

Presenter: Glen Kramer

Affiliation: Broadcom

Mr. Kramer presented options for NG-EPON requiring minimum development within 802.3 (via referencing NGPON2 PHY specification) and building on top of 10G-EPON specifications as defined today, as well as options requiring further work in 802.3 to achieve e.g. 25Gbps per wavelength channel. This latter option can be further augmented using NGPON2 wavelength grid to reach total port capacity of 100Gbps.

Follow-up discussion around this presentation resulted in an interesting conclusion: the main focus for NG-EPON for most operators present in the room is not the higher aggregate speed but the higher capacity, expressed as the number of wavelength channels supported in typical products and the number of subscribers that can be connected to a single OLT chassis. Mr. Noll indicated he would be preparing presentation on the timelines and also density requirements for the following meeting.

Chair to post the target timeline for draft, commenting, and following conference call on the reflector for discussion.

No new business was brought to Chair and the meeting was adjourned on 3rd of November 2014, at 10:47 AM.

NAME	AFFILIATION
Glen Kramer	Broadcom
Curtis KNITTLE	CABLE LABS
KEVIN A. NOLL	TIME WARNER CABLE
DOAN R. RYAN	HUAWEI
Zhigang Gong	O-Net
Akira Agata	KDDI Corporation
Saifur Rahman	Comcast Cable
RICK W LI	Cortina systems
Akio Tajima	NEC Corporation
Hesham ElBakoury	Hesh Huawei
Yasuaki Kawatsu	Hitachi Metals
Bill Powell	Alcatel-Lucent
Zugene Dai	COX communication

NAME	AFFILIATION
Ryan Hirth	Broadcom
GLEN Kramer	Broadcom
Ed Harstead	Alcatel-Lucent
Bill Powell	Alcatel-Lucent
LIQUAN YUAN	ZTE Corporation
dekun Liu	Hua wei
DEZHI ZHANG	ZTE CORPORATION
Saifur Rahman	Comcast Cable
HAL ROBERTS	CALIX
Akira Agata	KDDI Corporation
Kota Asaka	NTT
Akio Tajima	NEC Corporation
MARK LAUBACH	BROADCOM
DAVID LAW	HP
Hesham Elbakoury	Huawei.
MARTIN CARROLL	VERIZON
NIKOLAUS GIESCHEN	DEUTSCHE TELEKOM
CURTIS KNITTLE	CABLELABS
DUANE REMBEN	HUAWEI
Eugene Dai	COX COMMUNICATIONS
Cedric Lamm	Google
EDWIN MALLETTE	Bright House
MAREK HAJDUCIENIA	BRIGHT HOUSE