

IEEE P802.3av Task Force
Geneva Meeting Minutes
Recorded by Duane Remein

May 28, 2007

9:30 AM – Chair called meeting to order.

Motion #1 (Procedural):

Motion to approve minutes of last meeting.

1st Frank Chang

2nd Marek Hajduczenia

Motion was approved by voice vote without opposition.

9:35 AM – Chair reviewed IEEE Policies including; IEEE-SA Operations Manual (disclosure of affiliation, false or misleading disclosure), Voting Rights, Patent Policy (slides 1-5 of Presentation: “Highlights of the IEEE-SA Standards Board By-Laws” <http://standards.ieee.org/board/pat/pat-slideset.pdf>)

10:04 AM – Chair made Call for Patents. No participants indicated knowledge of applicable patents.

10:05 – Chair reviewed the task force timeline, meeting agenda.

Motion #2 (Procedural):

Approve Agenda

1st Jeff Mandin

2nd Duane Remein

Motion was approved by voice vote without opposition.

10:25 AM – Presentation #1:

Title: “Power Budget Ad Hoc Report”

By: Robert Lingle, Jr., OFS

See: [3av_0705_lingle_1.pdf](#)

Overview: This presentation reviewed Power budget Ad Hoc activities since last meeting. Consensus on power budget has not been achieved to date.

10:40 AM – Break

11:18 AM – Presentation #2:

Title: “10GEPON Power Budget Vendor Summary in Japan”

By: Motoyuki Takizawa, Fujitsu Access

See: [3av_0705_takizawa_1.pdf](#)

Overview: This presentation reviewed power budgets from the point of view of Japanese participants. Discussed cost issues for DML and EML ONU transmitters. It was suggested that using an enhanced FEC and/or high

power transmitters (for further study). Discussed APD overload issues for PX10 systems where SOA/PIN based RX would be used.

11:47 AM – Presentation #3:

Title: “PIN-PD based ONU for 10GE-PON”
By: Naoki Suzuki, Mitsubishi Electric
See: [3av_0705_suzuki_1.pdf](#)
Overview: This presentation looked at PIN vs. APD trade-offs including relative cost and complexity.

12:10 PM – Presentation #4:

Title: “APD@ONU for 10GE-PON”
By: Hiroshi Hamano, Fujitsu Access
See: [3av_0705_hamano_1.pdf](#)
Overview: This presentation looked at PIN vs. APD trade-offs (an opposing view to Presentation#3).

12:30 PM – Lunch

2:30 PM – Reconvened

2:30 PM – Presentation #5:

Title: “10/10 and 10/1 Budgets”
By: Frank Effenberger, Huawei
See: [3av_0705_effenberger_1.pdf](#)
Overview: Reviewed power budget proposals for PX10/20/B++ using an OMA approach. The presentation suggested 2 options; ONT with PIN (ONT common receiver) and ONT with APD (OLT common transmitter).

3:00 PM – Presentation #6:

Title: “10G High-Power Signal Source”
By: Hiroshi Hamano, Fujitsu Access
See: [3av_0705_hamano_2.pdf](#)
Overview: This presentation reviewed the possibility of using high power EML lasers (5-7 dBm range) to achieve optical budget.

3:07 PM – Presentation #7:

Title: “Semiconductor optical amplifier-based dual-rate multi-band OLT receiver for 1G/10G coexistence”
By: David Piehler, Aliphion
See: [3av_0705_piehler_1.pdf](#)
Overview: Explored possibility of using a SOA pre-amp coupled with a PIN in the OLT to achieve a B++ optical budget.

4:00 PM – Break

4:20 PM – Reconvened and had an open discussion on Optical Budget issues.

Straw Poll #1:

For the B++ case, I strongly oppose Downstream receiver specifications corresponding to:

- A) PIN-PD with amplified EML
- B) APD with high power (+2 or +3 dBm minimum output) EML

A) 11

B) 12

Count of Room: 36

Straw Poll #2:

For the B++ case, I strongly oppose Upstream receiver specifications corresponding to:

- A) APD with high output power (+3 to +5dBm min. average) DML (likely cooled)
- B) Pre-amplified PIN with lower power DML

A) 6

B) 11

Count of Room: 36

Discussed Pros and Cons of downstream PIN-PD at ONU with amplified EML at OLT

Pro	Con
Lowest cost solution (fully subscribed); system cost should comprehend replacement of ONUs during lifetime of OLT	More costly solution (fully subscribed and first costs)
Simple control electronics at ONU; does not require calibration (e.g. temperature)	Size of OLT too big, Tx and control electronics, power dissipation
Continuity with 1G EPON for easy/fast migration to 10G for existing suppliers	Questions of booster SOA reliability and availability for high power
Total volume of 10G PINs greater than that of 10G APDs; higher reliability of PIN over APD	Possible WDM crosstalk in OLT
All components commercially available today	Concern over optical surge from EDFA
	Concern for SRS penalty on analog video and XPM between 10G DS and video
	High power handling concerns

Discussed pros & cons for APD at ONU with high power (+2 or +3 dBm minimum output) EML at OLT

Pro	Con
Low development cost and short time-to-market	Expensive ONU (fully subscribed system)
OLT Tx in same footprint as 1G	Higher complexity in ROSA; multiple DC voltages required
FEC optical gain for APD > PIN	Twice power consumption at ONU
Components available today	Target spec for Tx power (+2-3 dBm) is difficult and beyond current technology
Cost effective OLT	Complex adjustment process

6:57 PM – recessed.

May 29, 2007

9:37 AM – Chair called the meeting to order. There was a short discussion about accepting a presentation from PMC Sierra on XAUI error issues submitted during the meeting.

The chair asked if there were any objections to allowing presentation of a proposal on XAUI error issues that arrived late. No objections were voiced although it was requested that the presentation deadline be more rigorously enforced.

9:45 AM – Presentation #8,#9,#10:

Title: “Wavelength Plan Proposal”, “Wavelength Allocation in the Existing ODN” and “Co-existence Optical Filter Simulation”
By: Keiji Tanaka, KDDI R&D; Akihiro Otaka, NTT Access Lab; Shinji Tsuji, Sumitomo Electric
See: [3av_0705_tanaka_1.pdf](#); [3av_0705_otaka_1.pdf](#); [3av_0705_tsuji_1.pdf](#)
Overview: These presentations were presented in conjunction with each other. This group of presentations provided proposals and rationale for a wavelength plan consistent with deployed networks with RF video overlay. The presentation noted that cooled LD is likely required to meet 29 dB optical budget. Suggested using a ~1570 nm band for 10 Gb DS and a narrowed (~20-40 nm) band in the 1260-1360 nm range for US.

10:30 AM – Presentation #11:

Title: “Downstream Wavelength Options”
By: Keiji Tanaka, KDDI R&D
See: [3av_0705_tanaka_2.pdf](#)
Overview: This presentation suggested a possible optional wavelength plan using either ~1490 nm or ~1580 nm bands.

10:35 AM – Presentation #12:

Title: “Status of ITU 984.enhance”
By: Frank Effenberger, Huawei
See: [3av_0705_effenberger_3.pdf](#)
Overview: This presentation summarized ITU activities on GPON enhancements. It also suggested using a narrowed band in the 1260-1360 nm band for US transmission.

10:53 AM – break

11:20 AM – held open discussion on wavelength plan. The following questions need to be answered prior to the next meeting: Where should we center the US wavelength band within the 1260-1360 band? What are DML Chirp properties at high launch power? Are there any issues of increased dispersion? What are effects on preamplified PIN proposal?

Straw Poll # 3:

I would prefer 10 Gbps upstream signal to be centered around 1310

Yes: 6
No: 15
Total: 35

Straw Poll #4:

I would prefer 10 Gbps upstream signal to have a pass band of:

20 nm: 10
40 nm: 5
Total: 35

Motion #3 (Technical):

10 Gbps upstream signal to have a pass band of 20 nm.

1st: Frank Effenberger
2nd: Marek Hajduczenia
Y: 25
N: 2
A: 7
Motion Passes

Motion #4 (Technical):

10 Gbps upstream signal shall be centered around either 1270 nm or 1350 nm.

1st: Frank Effenberger
2nd: Lowell Lamb
This motion was postponed (see Motion #4a).

Motion #4a (Technical):

Motion to postpone Motion #4 until further study is presented at the July meeting.

1st: David Piehler
2nd: Robert Lingle Jr.
Y: 25
N: 3
A: 5
Motion Passes

12: 20 PM - Regarding downstream wavelength plan there was a brief discussion on the following question: could optional wavelength plans for downstream apply to different PMDs rather than the same PMD (for example PX20 = 1490 and PX30 = 1577)?

12:30 PM – recessed for lunch.

2:40 PM – reconvened. Continued discussion on using different wavelength plans for different PMDs.

3:12 PM – Glen Kramer recused himself as Task Force Chair for FEC discussion, Chairmanship is assumed by Duane Remein. Taking of minutes is assumed by Marek Hajduczenia.

3:15 PM – Presentation #13:

Title: "Considerations on FEC and Line Code"
By: Frank Effenberger, Huawei
See: [3av_0705_effenberger_2.pdf](#)
Overview: A Presentation on the FEC coding gain for various FEC codes in the electrical and optical domains. Relationship between the optical and electrical gain was discussed. FEC blocks can be calculated over 65 bits blocks since the initial 2 bits of the sync header is already redundant.

3:33 PM – Presentation #14:

Title: "Considerations and Proposals on FEC Coding"
By: Fumio Daido, Sumitomo Electric
See: [3av_0705_daido_1.pdf](#)
Overview: Considerations for upstream and downstream channels - upstream codeword should be short to maximize the frame completion and channel utilization. For downstream - bandwidth should be preserved so low gain FEC can be used. Thus most appropriate FEC code words should be used for upstream and downstream channels but that depends also on the power budget discussions and the results which are concluded in there.

3:46 PM – Presentation #15:

Title: "Clarifications to FEC Codeword Structure"
By: Jeff Mandin, PMC Sierra
See: [3av_0705_mandin_2.pdf](#)
Overview: This presentation gave a discussion on the issues related with the FEC codeword incompatibility with the 66bit PCS words.

3:51 PM - Break

4:10 PM – Presentation #16:

Title: "Bridge Proposal for ONU Upstream Stack"
By: Jeff Mandin PMC Serra
See: [3av_0705_mandin_1.pdf](#)
Overview: The presentation gave additional considerations for the PCS state machines and their location in the stack.- IDLE deletion state mechanism was briefly discussed: its location in the stack and basic functionality. PMS data transmission was also discussed - in EPON systems we need to address the timing related with the data transition between the blocks of the system. In 10G EPONs we will therefore have to move the laser control function below the FEC encoder to make sure that the laser is turned on and off correctly. IDLE deletion introduces gaps into the data stream; PCS encodes bursts of data rather than continuous data stream. Scrambler and FEC get data bursts and we will need to introduce an additional buffer (FIFO) below the FEC encoder, which will cushion the data transmission between the FEC and PMA so that the data transmission between the FEC and PMA is continuous.
Issues related with Ordered Sets and their application to the laser control in 10GEPON systems was discussed.

Discussion on the proposed mechanism - will need to be implemented and tested in two different implementations to make sure that they are comparable..

5:08 PM – Presentation #17:

Title: “Start-of-Frame Alignment Within 66-bit Block”
By: Glen Kramer, Teknovus
See: [3av_0705_kramer_1.pdf](#)
Overview: This presentation discussed Start of Frame alignment.

5:26 PM – Break

5:36 PM – Presentation #18:

Title: “Idle Deletion / Start Alignment / Error Checking State Machine”
By: E. Lynskey, Teknovus
See: [3av_0705_lynskey_1.pdf](#)
Overview: This presentation proposed a state machine for correcting errors from XAUI interfaces.

5:52 PM – Presentation #19:

Title: “10G EPON PCS Error Handling”
By: E. Lynskey, Teknovus
See: [3av_0705_lynskey_2.pdf](#)
Overview: This presentation proposed a novel approach to the error handling for 10G EPON PCS errors, assuming that such are going to be observed at this interface.

6:15 PM – Presentation #20:

Title: “XAUI error protection concept”
By: Assi Zichlinski, PMC Sierra
See: [3av_0705_zichlinski_1.pdf](#)
Overview: This presentation proposed hardening the XAUI interface to prevent generation of bit errors which could potentially cause laser on/off state transitions in the PMA layer as a result of erroneous control codes.

Motion #5 (Technical):

802.3av shall not support a physical XAUI interface between PHY and MAC in the ONU.

1st: Jeff Mandin
2nd: Bidyut Parruck
Y: 16
N: 1
A: 13
Motion passes

Motion #6 (Technical):

The FEC algorithm shall accept as its input Nx65bit payloads (the second bit of the sync header plus 64 bits of data) pre-pended with padding consisting of zeros to bring the

input codeword to the required size; notwithstanding, both bits of the sync header shall be transmitted, while the padding shall not be transmitted, as illustrated in

3av_0705_effenberger_4.pdf.

1st Frank Effenberger

2nd Jeff Mandin

Y: 12

N: 0

A: 20

Motion passes

Motion #7 (Technical):

To accept as a baseline for FEC framing the presentations 3av_0701_effenberger1_1.pdf,

3av_0703_kramer_1.pdf, and 3av_0705_lynskey_1.pdf.

1st: Frank Effenberger

2nd: Eric Lynskey

Y: 17

N: 4

A: 8

Motion passes

6:38 PM - Recessed

May 30, 2007

9:35 AM – Reconvened with Glen Kramer as Chair and Duane Remein as a Recording Secretary. The Chair discussed administrative issues regarding interim meeting hosts and CERN lecture. The Group briefly discussed presentation submittal policy.

Motion #8 (Procedural):

Presentations not submitted by Monday of the week preceding a meeting shall not be allocated agenda time at the meeting. Editorial changes are allowed.

1st: Duane Remein
2nd: Marek Hajduczenia
Y: 29
N: 1
A: 3
Motion passes

9:50 AM – Presentation #21:

Title: “Link Model Adhoc - Activity Report”
By: Marek Hajduczenia, Nokia Siemens Networks
See: [3av_0705_hajduczenia_1.pdf](#)
Overview: Reviewed updated spreadsheet tool for link budget analysis. Discussion on the current state of the updated spreadsheet followed.

10:22 AM – Presentation #22:

Title: “Proposal for Optical Link Model”
By: Naoto Saeki, NEC
See: [3av_0705_saeki_1.pdf](#)
Overview: This presentation discussed inclusion of an estimated Chirp value and ISI penalties in the link model.

10:40 AM – a discussion on FEC requirements.

10:50 AM – Break

11:15 AM – Presentation #23:

Title: “A Rose by Any Other Name Would Smell As Sweet... But May Not Get Standardized!”
By: Duane Remein, Alcatel-Lucent
See: [3av_0705_remein_1.pdf](#)
Overview: This presentation discussed potential naming conventions for 10 GEAPON PMD and proposed defining and naming PMDs using a simplex uni-directional paired complementary transmitter and receiver convention.

Straw Poll #5:

I would support the simplex PMD convention:

Y: 21
N: 3

A: 6
Total in room 32

Straw Poll #6: (“Chicago Rules”)

I would support:

Option 1	4 supporters
Option 2	1 supporters
Option 3	16 supporters
I don't like any of these	0 supporters

Motion #9 (Technical):

802.3av Task Force authorizes the editors to create a Draft version 0.8 of the 10G EPON standard for presentation at the July meeting. Draft to include: Orlando Motions 3-7 and Geneva Motions 3, 5-7.

1st: Duane Remein

2nd: Marek Hajduczenia

Y: 31

N: 0

A: 1

Motion passes

11:55 AM – Presentation #24:

Title: “FEC Requirements Survey”

By: Bidyut Parruck, Cortina Systems

See: [3av_0705_parruck_1.pdf](#)

Overview: This presentation discussed desirable and allowable FEC parameters.

12:05 PM – Chair asked whether there were any requests for additional discussion or whether anyone would like to bring up any new business. No such requests were made.

Chair reiterated next meetings and made closing statements

Motion #10 (Procedural):

Motion to adjourn

Motion approved by voice vote without opposition.

12:06 PM – Meeting Adjourned.

List of attendees and affiliation

Name	Affiliation
Balter, Mickey	Broadlight
Ben Amram, Haim	PMC Sierra
Bossard, Martin	Helix AG
Chang, Frank	Vitesse
Daido, Fumio	Sumitomo Electric
Effenberger, Frank	Huawei Technologies
Feng, Dongning	Huawei Technologies
Hajduczenia, Marek	Nokia Siemens Networks
Hamano, Hiroshi	Fujitsu Labs
Herve, Pierre	Intel
Hotta, Yoshifumi	Mitsubishi Electric
Ikeda, Hiroki	Hitachi
Jiang, WB	JDSU
Kimura, Mitsunobu	Hitachi
Kramer, Glen	Teknovus
Lamb, Lowell	Teknovus
Lee, Dongsoo	ETRI
Leung, Raymond	Huawei Technologies
Lingle, Robert	OFS
Lynskey, Eric	Teknovus
Mandin, Jeff	PMC Sierra

Name	Affiliation
Mukojima, Toshiaki	Oki Electric
Nomura, Takumi	NEC Com.
OTAKA, Akihiro	NTT
Parruck, Bidyut	Cortina Systems
Piehler, David	Alphion
Remein, Duane	Alcatel-Lucent
Saeki, Naoto	NEC Corp.
Suzuki, Ken-Ichi	NTT
Tajima, Akio	NEC Corp.
Takeda, Noriyuki	KDDI R&D Labs
Takizawa, Motoyuki	Fujitsu Access
Tanaka, Keiji	KDDI R&D Labs
Tatsuta, Tsutomu	NTT
Toyoda, Hidehiro	Hitachi
Tsuji, Shinji	Sumitomo Electric
UCHIKATA, Tatsuya	NEC
Uematsu, Kiyoshi	OKI Electric
Yokomoto, Tetsuya	Fujitsu Access
Yoon, Bin Yeong	ETRI
Zichlinski, Assi	PMC Sierra