

Approved Minutes
IEEE 802.3 Next Generation 100Gb/s Optical Ethernet Study Group
Plenary meeting
13-15 March, 2012
Waikoloa, HI, USA

Prepared by: Kapil Shrikhande, Dell

13 March, 2012

The meeting was called to order at 8:33 a.m., on 13 March, 2012 by Dan Dove, Study Group Chair.

Kapil Shrikhande volunteered as Recording Secretary for this meeting.

Documentation for the Waikoloa plenary meeting can be found at the meeting web-page:

<http://www.ieee802.org/3/100NGOPTY/public/mar12/plenary/index.html>

The Chair noted that the minutes for the January 2012 meeting were approved at the co-located interim meeting on Mar 12.

Agenda and General Information

By: Dan Dove, SG Chair

See: dove_02a_0312_NG100GOPTY.pdf

(Revised presentation *dove_02c_0312* has been uploaded the web-site)

Motion to approve the agenda:

Passes by voice without opposition

The Chair asked if there are any reporters in the room or if anyone is reporting publicly at this meeting.

Scott Kipp and Dan Dove said they might write a blog for the Ethernet Alliance on this meeting.

The Chair presented the Study Group decorum.

The Study Group was reminded that photographs or recordings are not allowed without permission.

The Chair presented the rest of the Agenda and General Information presentation

Start of technical presentations, at 9:00 a.m.

Presentation # 1

Title: 100G Next Gen Optics MMF ad hoc meetings review

By: Jonathan King, Finisar

See: king_01_0312_NG100GOPTY.pdf

Presentation # 2

Title: Next Generation 100GbE SMF Ad Hoc report

By: Pete Anslow, Ciena

See: anslow_01_0312_NG100GOPTY.pdf

Presentation # 3

Title: Objectives for Next Generation 100GbE Optical Interfaces

By: Pete Anslow, Ciena

See: anslow_02_0312_NG100GOPTX.pdf

Presentation # 4

Title: Thoughts About Possible Energy Savings for 100G Next Generation Optical Ethernet

By: Mike Bennett, Lawrence Berkeley National Labs

See: bennett_01_0312_NG100GOPTX.pdf

Presentation # 5

Title: Low power MMF objective for High Performance Computing and End-of-Row applications

By: Brad Booth, Dell

See: dawe_01_0312_NG100GOPTX.pdf

Break, 10:10 a.m.

Reconvened, 10:30 a.m.

Presentation # 6

Title: Measurements Results of 25.78 GBd VCSEL Over OM3 with and without Equalization

By: Ali Ghiasi, Broadcom

See: ghiasi_01_0312_NG100GOPTX.pdf

Presentation # 7

Title: Simulations and Spreadsheet Link Model of 25.78G VCSEL Link

By: Ali Ghiasi, Broadcom

See: ghiasi_02_0312_NG100GOPTX.pdf

Break at 11:53 a.m.

Reconvened at 12:55p.m.

Presentation # 8

Title: Meeting MMF 5-Criteria

By: Andre Szczepanek, [Inphi](#)

See: szczepanek_01_0312_NG100GOPTX.pdf

Presentation # 9

Title: 100G MMF Reach Objective

By: John Petrilla, [Avago Technologies](#)

See: petrilla_02b_0312_NG100GOPTX.pdf

Presentation # 10

Title: Potential MMF objectives and the 5 criteria

By: Jonathan King, [Finisar](#)

See: king_03_0312_NG100GOPTX.pdf

Break at 2:52 p.m.

Reconvened at 3:10 p.m.

Presentation # 11

Title: MMF Objectives & Bit Rate/Reach Gaps

By: John Abbott, [Corning](#)

See: [abbott_01_0312_NG100GOPTX.pdf](#)

Presentation # 12

Title: Low Power 100GbE modules

By: Scott Kipp, [Brocade](#)

See: [kipp_01_0312_NG100GOPTX.pdf](#)

Presentation # 13

Title: Setting Optimal Reach Objectives, Indications from Total Cost Analysis Over Time

By: Paul Kolesar, [Commscope](#)

See: [kolesar_01_0312_NG100GOPTX.pdf](#)

Presentation # 14

Title: Data Center architecture trends and their impact on PMD requirements

By: Mark Nowell, [Cisco](#)

See: [nowell_01a_0312_NG100GOPTX.pdf](#)

Presentation # 15

Title: 100GE Fiber and Optics Options

By: Dan Dove, Applied Micro

See: [lahiri_01_0312_NG100GOPTX.pdf](#)

Meeting recessed for the day, 5:28 p.m.

14 March, 2012

Dan Dove, SG Chair presented the agenda for the day.

The Chair presented study group decorum and ground rules.

Start of technical presentations, 8:45 a.m.

Presentation # 16

Title: 100G PAM PMD Observations

By: Chris Cole, Finisar

See: [cole_01a_0312_NG100GOPTX.pdf](#)

(Revised presentation [cole_01b_0312](#) was uploaded to the web-site after the presentation)

Presentation # 17

Title: Bandwidth Requirements for PAM

By: John Heaton, JDSU

See: [heaton_01a_0312_NG100GOPTX.pdf](#)

Break at 10 a.m.
Reconvened at 10:15 a.m.

Presentation # 18

Title: PAM-N, coherent interference and return loss specs
By: Jonathan King, Finisar
See: king_02_0312_NG100GOPTX.pdf

Presentation # 19

Title: CMOS Photonics 101
By: Tom Palkert, Luxtera
See: palkert_03b_0312_NG100GOPTX.pdf

Presentation # 20

Title: High Speed NRZ and PAM optical modulation using CMOS Photonics
By: Bipin Dama, Lightwire
See: dama_01_0312_NG100GOPTX.pdf

Presentation # 21

Title: Multipath Interference Penalty
By: Ali Ghiasi, Broadcom
See: ghiasi_03_0312_NG100GOPTX.pdf

Lunch at 12:02
Re-convened at 1:05 p.m.

Presentation # 22

Title: Analysis of Phase-to-Intensity Noise by multiple reflections in 100G-PAM SMF links
By: Jon Anderson, Opnext
See: kogure_01_0312_NG100GOPTX.pdf

Presentation # 23

Title: Update on technical feasibility for PAM modulation
By: Gary Nicholl, Cisco
See: nicholl_01a_0312_NG100GOPTX.pdf

(Revised presentation *nicholl_01b_0312* was uploaded to the web-site after the presentation)

Presentation # 24

Title: PAM8 Gearbox issues
By: Andre Szczepanek, Inphi
See: szczepanek_02_0312_NG100GOPTX.pdf

Presentation # 25

Title: PAM Simulation
By: Tom Palkert, Luxtera
See: palkert_05_0312_NG100GOPTX

Break at 2:48 p.m.
Reconvened at 3:05 p.m.

Presentation # 26

Title: Considerations for WDM NRZ links: CMOS-Integrated Silicon Photonics case
By: Yuri Vlasov, IBM
See: vlasov_01_0312_NG100GOPTX

Presentation # 27

Title: Proposed 100G PSM4 relative costs
By: Tom Palkert, Luxtera
See: palkert_01c_0312_NG100GOPTX

Presentation # 28

Title: Intermediate SMF reach option for 100GE
By: John Petrilla, Avago Technologies
See: petrilla_01a_0312_NG100GOPTX

Presentation # 29

Title: 100G Parallel PMD Observations
By: Chris Cole, Finisar
See: cole_02_0312_NG100GOPTX.pdf

(Revised presentation *cole_02a_0312* was uploaded to the web-site after the presentation)

Meeting recessed for the day, 5:30 p.m.

15 March, 2012

The Chair discussed the agenda for the day.
The Chair presented study group decorum and ground rules

The Chair requested permission from the SG for Tom Palkert to present a modified presentation. No opposition from the group.

The Chair requested permission from the SG for Francois Tremblay to present a late submission. No opposition from the group.

Presentation # 30

Title: Why PSM4?
By: Tom Palkert, Luxtera
See: palkert_02b_0312_NG100GOPTX.pdf

Presentation # 31

Title: PAM-8 and PAM-16 Optical Receivers for 2km 100G Links with a 4dB loss budget
By: Francois Tremblay, [Gennum](#)
See: tremblay_01_0312_NG100GOPTX

End of Technical presentations

The Chair indicated that the floor is open for motions and straw-polls

Motions and Straw-polls

See *motions_0312* uploaded on the web-page

See *straw_polls_0312* uploaded on the web-page

Motion # 1

Request 802.3 extend our Study Group for an additional period of 6 months

Moved: Dan Dove

Second: Kapil Shrikhande

Y: 74

N: 0

A: 0

Motion passes

Motion # 2

Pending approval by 802.3 and the EC to modify the scope of our SG to include 40G, adopt the following objective:

- Define a 40 Gb/s PHY for operation over at least 40 km of SMF

Moved: Pete Anslow

Second: Jon Anderson

Y: 63

N: 0

A: 14

Motion passes

Count with 802.3 voters only

Y: 44

N: 0

A: 9

Motion # 3

Adopt the following objective:

- Define a 100 Gb/s PHY for operation up to at least 500 m of SMF

Moved: Steve Trowbridge

Second: Peter Stassar

Y: 69

N: 0

A: 2

Motion passes

Count with 802.3 voters only

Y: 49

N: 0

A: 1

Break at 10:15 a.m.

Reconvened at 10:40 a.m.

Motion #4

Adopt the following objectives:

- Define a 100 Gb/s PHY for operation up to at least 100 m of MMF
- Define a 100 Gb/s PHY for operation up to at least 20 m of MMF

Moved: Jonathan King

Second: Steve Swanson

Y: 69

N: 2

A: 6

Motion passes

Count with 802.3 voters only

Y: 49

N: 1

A: 3

Note: before Motion #4 was voted on, Motion #5 -- motion to amend was voted on and failed; and another motion to amend failed due to the lack of a second. See below.

Motion # 5

Motion to amend Motion 4 to change 100 m to 150 m

Moved: Paul Kolesar

Second: John Abbott

Y: 16

N: 47

A: 14

Motion fails

Another motion to amend Motion 4 (Moved: Chris Cole) to change 20 m to 30 m was brought to the floor. Motion fails owing to the lack of a Second.

Straw Poll #1

How many of you will attend the May 14 – 18, 2012 Interim in Minneapolis, MN, USA?

SG or TF name: NG100GOPTX

Yes: 43

Probably yes: 14

Probably no: 7

No: 2

Motion to adjourn

Moved: Brad Booth

Second: John D'Ambrosia

Passes by voice without opposition

NG100G Optics Study Group Attendee List, Plenary meeting, 13-15 March 2012, Waikoloa, HI

| Last Name | First Name | Affiliation | Tuesday Mar 13 | Wednesday Mar 14 | Thursday Mar 15 |
|-------------|------------|----------------------------|-------------------|---------------------|--------------------|
| Abbas | Ghani | Ericsson | X | X | X |
| Abbott | John | Corning Inc | X | X | X |
| Anderson | Jon | Opnext | X | X | X |
| Anslow | Pete | Ciena | | X | X |
| Barrass | Hugh | Cisco | | X | |
| Bennett | Mike | LBNL | X | | X |
| Berger | Chris | Luxtera | X | X | X |
| Bhatt | Vipul | Lightwire | X | X | X |
| Booth | Brad | Dell | X | | |
| Carroll | Martin | Verizon | X | | |
| Cole | Chris | Finisar | X | X | X |
| Cui | Kai | Huawei | X | X | X |
| D'Ambrosia | John | Dell | | | X |
| Dama | Bipin | Lightwire | X | X | X |
| Dawe | Piers | IPtronics | X | X | X |
| Dove | Dan | Applied Micro | X | X | X |
| Dudek | Mike | Qlogic | | X | |
| Flatman | Alan | LAN Technologies | X | X | X |
| Ghiasi | Ali | Broadcom | | X | |
| Gustlin | Mark | XILINX | | X | X |
| Hamano | Hiroshi | Fujitsu Labs | X | X | X |
| Ho | Francis | Inphi | X | X | |
| Isono | Hideki | Fujitsu Optical Components | X | X | X |
| Jiang | Wenbin | Cosemi | X | X | |
| Jimenez | Andrew | Anixter Inc. | X | | |
| Katsuhisa | Tawa | Sumitomo Electric | X | X | X |
| Kimmtli | Myles | Emuley | | X | X |
| King | Jonathan | Finisar | | X | |
| Kipp | Scott | Brocade | | X | X |
| Kodama | Satoshi | NTT | X | X | X |
| Kolesar | Paul | Commscope | X | X | X |
| Kono | Masahi | Hitachi | X | X | X |
| Kvist | Bengt | Ericsson | | | X |
| Lai Shao | Huairong | Samsung USA | | | X |
| Latchman | Ryan | Mindspeed | | X | |
| LeCheminant | Greg | Agilent Technologies | X | X | X |
| Lewis | Dave | JDSU | X | X | X |

| | | | | | |
|------------|-----------|------------------------|---|---|---|
| Li | Mike | Altera | | X | X |
| Lingle | Robert | OFS | X | X | |
| Lutz | Sharon | US Conec Ltd | X | X | X |
| Maki | Jeffery | Juniper | X | X | X |
| Martin | Arlon | Kotura | X | X | X |
| McClay | Phil | TE Connectivity | X | X | X |
| McDonough | John | NEC America | X | X | X |
| McDermott | Tom | Fujitsu Labs | X | X | X |
| Misek | Brian | Avago | X | X | X |
| Nicholl | Gary | Cisco | | X | X |
| Nowell | Mark | Cisco | X | X | X |
| Ofelt | David | Juniper | | X | X |
| Palkert | Tom | Xilinx, Molex, Luxtera | X | X | X |
| Park | Jisang | LS Cable and System | X | X | |
| Patel | Pravin | IBM | | | X |
| Petrilla | John | Avago Technologies | X | X | X |
| Perrie | Randy | Onechip Photonics | X | X | X |
| Pimpinella | Rick | Panduit Corp | X | X | X |
| Rabinovich | Rick | Alcatel Lucent | | | X |
| Salunke | Vineet | Cisco | X | X | X |
| Sambasivan | Sam | AT&T | X | X | X |
| Shrikhande | Kapil | Dell | X | X | X |
| Shang | Song | Semtech | X | X | |
| Sprague | Ted | Infinera | X | X | X |
| Stassar | Peter | Huawei | X | X | X |
| Swanson | Steve | Corning Inc | X | X | X |
| Szczepanek | Andre | Inphi | X | X | X |
| Teipen | Brian | ADVA Optical | X | X | |
| Tracy | Nathan | TE Connectivity | X | | X |
| Tremblay | Francois | Genum | X | X | X |
| Trowbridge | Steve | Alcatel Lucent | X | X | X |
| Umnov | Alexander | Huawei | | | X |
| Vaden | Sterling | Optical Cable | X | X | X |
| Wong | CK | FCI Mergeoptics | X | X | X |
| Zhao | Wenyu | CATR China | X | X | X |
| Yoon | Hyunk Suk | TeraSquare | X | X | X |
| Nishihara | Susumu | NTT | | | X |
| Farhoodfar | Arash | Cortina Systems | | | X |
| Xu | Yu | Huawei | X | X | X |
| Timmis | Jon | OCC | X | X | |
| Cady | Ed | Volex | X | X | |

| | | | | | |
|----------|---------|-------------------|---|---|---|
| Kawatsu | Yasuaki | Hitachi Cable | | | X |
| Kaku | Shinkyō | Allied Telesis | X | X | X |
| Hiramoto | Kiyo | Opnext | X | X | X |
| Nakamoto | Ed | Spirent | X | X | X |
| Cvijetic | Milorad | NEC | X | X | X |
| Heaton | John | JDSU | X | X | |
| Mein | John | Onechip Photonics | X | X | X |
| Lackner | Hans | QosCom | | | X |
| Mei | Richard | Commscope | X | X | X |
| Shariff | Masood | Commscope | X | X | X |
| Teixeira | Antonio | NSN Networks | X | | |
| Vlasov | Yuri | IBM | X | X | |
| Mathews | Kirsten | BMW | X | | |