




IEEE P802.3ba 40Gb/s and 100Gb/s Ethernet

Opening Plenary Report

Denver, CO
July 2008

John D'Ambrosia
jdambrosia@ieee.org



IEEE P802.3ba Task Force Organization

<u>John D'Ambrosia</u>	Task Force Chair
<u>Ilango Ganga</u>	Task Force Chief Editor
<u>Mark Gustlin</u>	"Logic" Sub-task Force Chief Editor Editor – RS and PCS Clauses
<u>Chris DiMinico</u>	"Cu" Sub-task Force Chief Editor Editor – 40/100G Cu PMD
<u>Pete Anslow</u>	"Optical" Sub-task Force Chief Editor Editor – SMF PMD Clause(s)
<u>Hugh Barrass</u>	Editor – Mgmt Clauses
<u>Jonathan King</u>	Editor – SMF PMD Clause(s)
<u>Arthur Marris</u>	Editor – 40G Backplane Clauses
<u>Steve Trowbridge</u>	Editor – PMA Clause
<u>Piers Dawe</u>	Editor – 40/100G MMF PMD Clause Chair – "Statistical Eye" Ad Hoc
<u>Alessandro Barbieri</u>	Co-chair – Extended Reach Parallel MMF Ad Hoc
<u>John Petrilla</u>	Co-chair - Extended Reach Parallel MMF Ad Hoc
<u>George Oulundsen</u>	Task Force Secretary
<u>Frank Chang</u>	Task Force Web Master

Reflector and Web

- To subscribe to the IEEE P802.3ba Task Force reflector, send an email to:

ListServ@ieee.org

with the following in the body of the message (do not include “<>”):

***subscribe stds-802-3-hssg <yourfirstname> <yourlastname>
end***

- Send IEEE P802.3ba Task Force reflector messages to:

STDS-802-3-HSSG@listserv.ieee.org

- Task Force web page URL:

http://www.ieee802.org/3/ba/

IEEE P802.3ba Private Area

- URL: <http://www.ieee802.org/3/ba/private/>
 - Username: 802.3ba
 - Password: xxxxxxxx
 - Password is case sensitive

- Write it down...

Task Force Approved Project Documents

■ PAR

- http://ieee802.org/3/ba/PAR/par_0308.pdf

■ 5 Criteria (pending IEEE 802 EC Approval)

- http://ieee802.org/3/ba/PAR/P802.3ba_5C_0308.pdf

■ Objectives

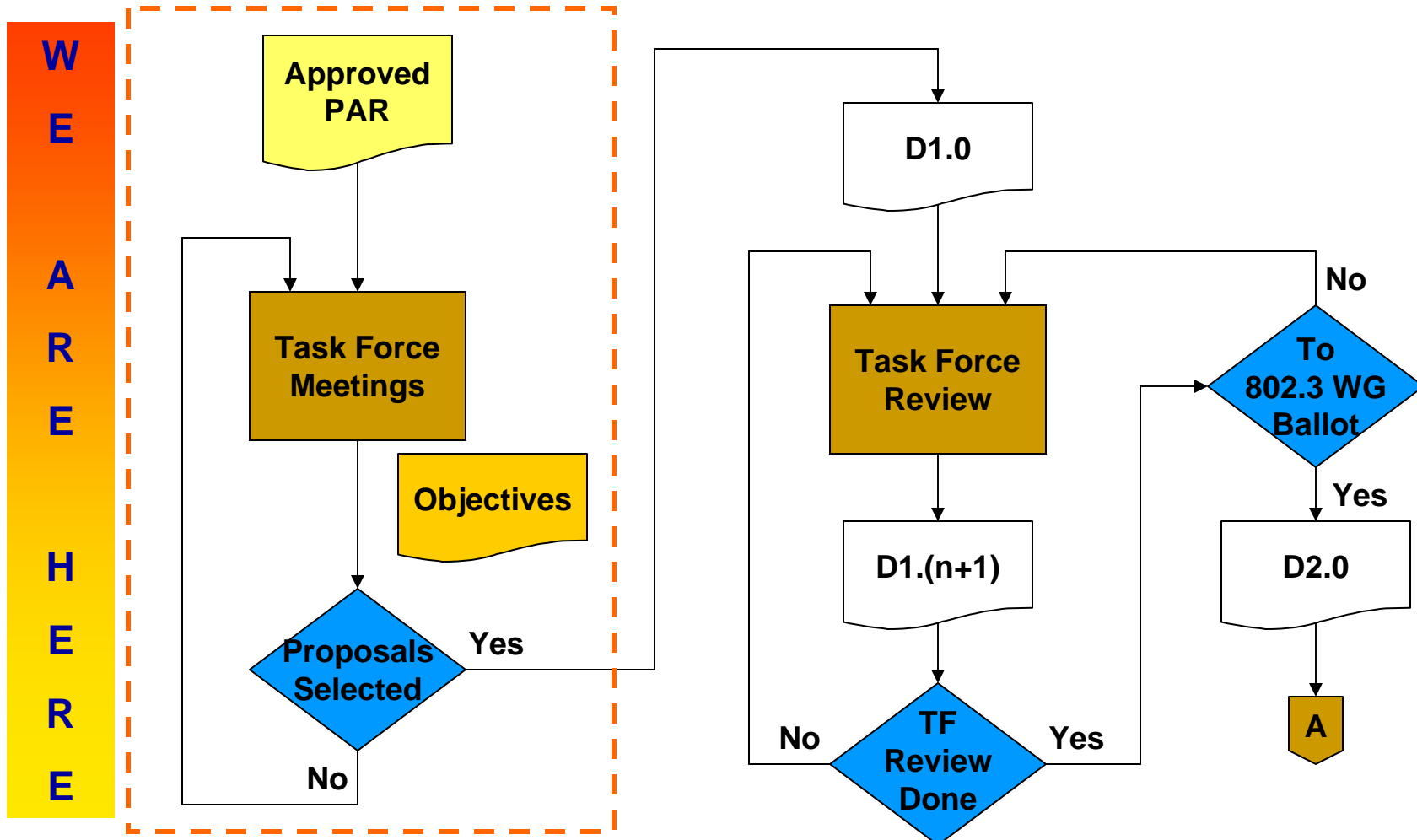
- http://ieee802.org/3/ba/PAR/P802.3ba_Objectives_0308.pdf

Task Force Objectives

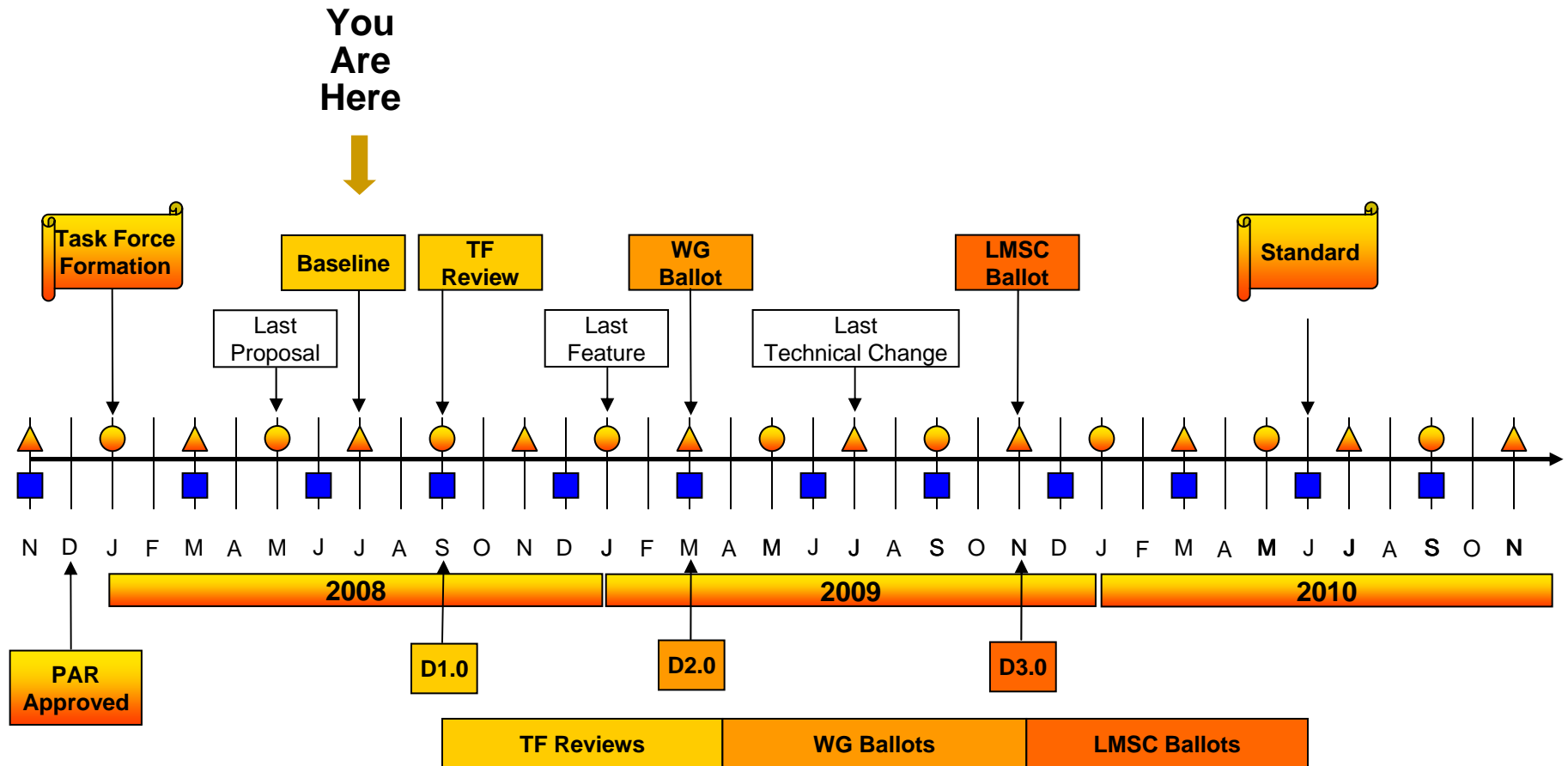
- Support full-duplex operation only
- Preserve the 802.3 / Ethernet frame format utilizing the 802.3 MAC
- Preserve minimum and maximum FrameSize of current 802.3 standard
- Support a BER better than or equal to 10^{-12} at the MAC/PLS service interface
- Provide appropriate support for OTN
- Support a MAC data rate of 40 Gb/s
- Provide Physical Layer specifications which support 40 Gb/s operation over:
 - at least 10km on SMF
 - at least 100m on OM3 MMF
 - at least 10m over a copper cable assembly
 - at least 1m over a backplane
- Support a MAC data rate of 100 Gb/s
- Provide Physical Layer specifications which support 100 Gb/s operation over:
 - at least 40km on SMF
 - at least 10km on SMF
 - at least 100m on OM3 MMF
 - at least 10m over a copper cable assembly

Adopted by IEEE P802.3ba and approved by 802.3 at Mar 2008 Plenary

Overview of IEEE 802.3 Standards Process (2/5) - Task Force Comment Phase



IEEE P802.3ba Task Force Timeline



* Adopted by IEEE P802.3ba TF at March 08 Plenary

Legend	
▲	IEEE 802 Plenary
●	IEEE 802.3 Interim
■	IEEE-SA Standards Board

May Interim Meeting

- Munich, Germany
 - May 13 - 15
 - Hosted by Linear Technologies – Thank You!
 - 142 Attendees
 - 42 Presentations
 - Significant progress towards generating D1.0

Liaisons

- Liaison report from ISO/IEC JTC 1/SC 25/WG 3 to IEC SC 86A on Maximum attenuation values for buffered and cabled B1.3 Optical Fibres
 - IEC SC86 has been asked to define max attenuation for indoor cabled B1.3 (low water peak) singlemode fibre @ 1310nm/1383nm/1550nm.
 - Copy of liaison request posted at <http://www.ieee802.org/3/ba/public/may08/3n870A.pdf>.
- OIF2008.164.01
 - OIF CEI-25G-SR: electrical interface for chip-to-chip and chip-to-optics module at baud rates up to 28Gbps

Straw Polls (1 of 2)

- **Straw Poll #1**: Are we ready to make a decision, this week, on the 40/100G architecture as proposed in “ganga_01_0508.pdf” for baseline. [All \(Y/N\): 67/9](#)
- **Straw Poll #2**: Are we ready to make a decision, this week, on the 40/100G architecture as proposed in “ganga_01_0508.pdf” for baseline with the exclusion of the option for the electrical interface (XLAUI/CAUI) that can be decided later and exclude the examples. [All \(Y/N\): 79/2](#)
- **Straw Poll #3**: Are we ready to make a decision, this week, on the 40/100G architecture as proposed in “ganga_01_0508.pdf” for baseline with the inclusion of an optional n lane x 10.3125GBd electrical interface for PMD service interface and exclude the examples. [All \(Y/N\): 77/2](#)
- **Straw Poll #4**: Are we ready to adopt the PCS proposal as defined in the “gustlin_01_0508.pdf” this week. [All \(Y/N\): 69/0](#)
- **Straw Poll #5**: Are we ready to adopt the XL/CGMII definition as described in “gustlin_02_0508.pdf” this week. [All \(Y/N\): 81/0](#)
- **Straw Poll #9**: Are we ready to make a decision this week on “Appropriate support for OTN” based on “trowbridge_01_0508.pdf” for baseline. [All \(Y/N\): 51/7](#)
- **Straw Poll #10**: Are we ready to adopt, this week, “cole_02_0508.pdf” as the baseline for “100GBE 40-km SMF PMD”. [All \(Y/N\): 81/1](#)

Straw Polls (2 of 2)

- **Straw Poll #11:** I believe that a baseline proposal for the 40GBE 10-km SMF PMD should be based on:
 - A) 4x10G CWDM (as per “cole_03_0508.pdf”)
 - B) 40G Serial (as per “jewell_03_0508.pdf”)
 - C) I need more information and presentation material before deciding.
 - D) I will abstain now and later.

Results (A / B / C / D): 25 / 23 / 35 / 6
- **Straw Poll #12:** I believe that a baseline proposal for the “100GBE 10-km SMF PMD” should be based on:
 - A) 4x25G CWDM (as per “traverso_01_0308.pdf”)
 - B) 4x25G LAN WDM (as per “cole_01_0508.pdf”)
 - C) 10x10G WDM (as per “schrans_01_0508.pdf”)
 - D) I need more information and presentation material before deciding.
 - E) I will abstain now and later.

Results (A / B / C / D / E): 9 / 48 / 6 / 3 / 14
- **Straw Poll #13:** Are we ready to adopt, this week, “pepeljugoski_01_0508.pdf” for a baseline for 100GBASE-SR10 and 40GBASE-SR4. All (Y/N): 64 / 3
- **Straw Poll #14:** Should we continue to work on a proposal for a full duplex 40GBE and 100GBE MMF PMD solution as in “kropp_01_0508.pdf”. All (Y/N): 37 / 13
- **Straw Poll #15:** Should we continue to work on a proposal for an annex to extend the reach of a 40GBASE-SR4 and 100GBASE-SR10 in addition to the proposal (“pepeljugoski_01_0508.pdf”) as in “jewell_01_0508.pdf”. All (Y/N): 55 / 3

May 2008 Interim Meeting: Baseline Proposals Selected

See http://grouper.ieee.org/groups/802/3/ba/BaselineSummary_0508.pdf for detailed summary of motions and specific slides from proposals that were adopted

- **Draft Outline** (http://grouper.ieee.org/groups/802/3/ba/public/may08/ganga_02_0508.pdf)
- **Nomenclature** (http://grouper.ieee.org/groups/802/3/ba/public/may08/ganga_02_0508.pdf)
- **Architecture** (http://grouper.ieee.org/groups/802/3/ba/public/may08/ganga_01_0508.pdf)
 - Inclusion optional electrical interface for PMD service interface (specific electrical details not defined yet)
 - XLAUI / CAUI electrical Interface (specific electrical details not defined yet)
- **XLGMII / CGMII** (http://grouper.ieee.org/groups/802/3/ba/public/may08/gustlin_02_0508.pdf)
- **PCS** (http://grouper.ieee.org/groups/802/3/ba/public/may08/gustlin_01_0508.pdf)
- **OTN Support** (http://grouper.ieee.org/groups/802/3/ba/public/may08/trowbridge_01_0508.pdf)
- **40G/100G MMF PMD**
(http://grouper.ieee.org/groups/802/3/ba/public/may08/pepeljugoski_01_0508.pdf)
- **100GE 40km SMF PMD** (http://grouper.ieee.org/groups/802/3/ba/public/may08/cole_02_0508.pdf)
- **100GE 10km SMF PMD** (http://grouper.ieee.org/groups/802/3/ba/public/may08/cole_01_0508.pdf)
- **Backplane PHY** (http://grouper.ieee.org/groups/802/3/ba/public/may08/mellitz_01_0508.pdf)

Motions

- **Motion #1**: Move to adopt the draft outline, based on slides 3 thru 7 of “ganga_02_0508.pdf” as the basis for the first draft of P802.3ba.
Results: All (y/n/a): 103 / 0 / 1 802.3 Voters (y/n/a): 60 / 0 / 1
- **Motion #2**: Move to adopt the nomenclature, based on slide 8 of “ganga_02_0508.pdf” as the basis for the first draft of P802.3ba
Results: All (y/n/a): 68 / 16 / 25 802.3 Voters (y/n/a): 33 / 15 / 12
- **Motion #3**: Move that the 802.3ba Task Force adopt slides 4 thru 9 as the 40/100G architecture as proposed in “ganga_01_0508.pdf” with the inclusion of an optional n-lane x 10.3125GBd electrical interface for PMD service interface (to slides 5,6, and 9), as baseline.
Results: All (y/n/a): 80 / 0 / 18 802.3 Voters (y/n/a): 53 / 0 / 3
- **Motion #4**: Move to adopt “gustlin_02_0508.pdf” as the baseline for the XLGMII and CGMII logical interfaces.
Results: All (y/n/a): 95 / 0 / 12 802.3 Voters (y/n/a): 53 / 0 / 4
- **Motion #5**: Move to adopt “gustlin_01_0508.pdf” as the baseline for the 40GbE and 100 GbE PCS
Results: All (y/n/a): 100 / 0 / 12 802.3 Voters (y/n/a): 56 / 0 / 3
- **Motion #6**: Move that the 802.3ba Task Force adopt the parallel PMD proposal and tables on pages 6, 8, 9 and 10 of (pepeljugoski_01_0508) as the baseline proposal of the work of the task force towards writing the first draft standard for 40GBASE-SR4 and 100GBASE-SR10.
Results: All (y/n/a): 85 / 0 / 22 802.3 Voters (y/n/a): 51 / 0 / 7

Adopted Nomenclature

- Nomenclature for the 3 part suffix
- Speed
 - 40 = 40Gb/s,
 - 100 = 100Gb/s
- Medium type
 - Copper
 - K = Backplane
 - C = Cable assembly
 - Optical
 - S = Short Reach (100m)
 - L = Long Reach (10Km)
 - E = Extended Long Reach (40Km)
- Coding scheme
 - R = 64B/66B block coding
- Number of lanes or wavelengths
 - Copper: n = 4 or 10
 - Optical: n = number of lanes or wavelengths
 - n=1 not required as serial is implied

Motions: Appropriate Support for OTN

- **Motion #8:** Move to adopt “trowbridge_01_0508.pdf” as the baseline for the “Appropriate support for OTN”.
Results: All (y/n/a): 54 / 6 / 29 802.3 Voters (y/n/a): 31 / 2 / 11
- Last bullet, Slide 11, trowbridge_01_0508
 - “The mapping of 40G Base-?? signals into OPU3 (to be) specified in ITU-T Recommendation G.709 depends on the set of control block types shown in Figure xx-yy. Any change to the coding specified in Figure xx-yy must be coordinated with ITU-T Study Group 15.”
- Motion to Reconsider: [Approved by voice vote without objection](#)
- Motion to Amend: [Approved by voice vote without objection](#)
- Amended Motion: Move to adopt “trowbridge_01_0508.pdf” as the baseline for the “Appropriate support for OTN” with the inclusion of “and pending concurrence of the 802.3 working group” prior to the last bullet of slide 11.
[Results: All: Approved by voice vote without objection](#)
- Further discussion this week. Generate liaison to ITU-T SG15 and get 802.3WG approval.

Motions

- **Motion #12**: Move to adopt 4x25G LAN WDM (as per cole_02_0508) as the baseline proposal for the 100GE 40km SMF PMD.
Results: All (y/n/a): 78 / 0 / 15 802.3 Voters (y/n/a): 45 / 0 / 8
- **Motion #13**: Move to adopt 4x25G WDM as the baseline proposal for the optical lane structure of 100GE 10km SMF PMD as per “cole_01_0508.pdf” and traverso_01_0308.pdf” with grid spacing to be decided.
Results: All (y/n/a): 69 / 2 / 24 802.3 Voters (y/n/a): 42 / 2 / 9
- **Motion #15**: Move to adopt 4x25G LAN WDM (as per cole_01_0508) as the baseline proposal for 100GE 10km SMF PMD.
Results: All (y/n/a): 51 / 5 / 42 802.3 Voters (y/n/a): 35 / 3 / 18
- **Motion #16**: Move to adopt mellitz_01_0508.pdf as the baseline for the 40GbE backplane PHY (40GBASE-KR4).
Results: All (y/n/a): 59 / 0 / 30 802.3 Voters (y/n/a): 35 / 0 / 14
- **Motion #17**: Move to adopt the multimode skew model described in “kolesar_01_0508.pdf” and embodied in the spreadsheet of “kolesar_02_0508.xls” (updated to include the addition of “Notes” worksheet).
Results: Approved by voice vote without objection

IEEE P802.3ba MMF Proposals

- Only 1 Reach ($\geq 100\text{m}$) per rate specified in Objectives
- Options
 - Option A: pepeljugoski_01_0508
 - “n”x10 solution, $\geq 100\text{m}$ OM3 parallel fiber
 - Adopted as baseline
 - Option B: jewell_01_0508
 - “n”x10 solution, extending reach beyond 100m on OM3 / OM4 parallel fiber
 - Extended Reach Over Parallel MMF Ad hoc Formed
 - Different solutions being discussed.
 - Distinct Identity - New objective?
 - Option C: kropp_01_0508
 - Over OM3 full duplex (dual fiber) fiber: 40 GbE – 2x20
 - Distinct Identity - New Objective?

Goals for the week

- Progress towards generating D1.0
 - Hear Proposals related to:
 - Open items that need to be resolved
 - Remaining Proposals to be adopted
 - PMA Sublayer
 - PMD Service interface
 - XLAUI / CAUI interface
 - 40G / 100G for $\geq 10\text{m}$ Cu Cable Objectives
 - 40G for $\geq 10\text{km}$ SMF objective
 - Other Issues
 - FEC
 - Extended Reach over Parallel MMF Ad Hoc efforts
 - Dual Fiber MMF for 40GbE Proposal
 - Adopted proposals that need refinement
 - Identify new issues
 - Hear Technical Presentations
- Review liaisons
- Update on IEEE P802.3az
- Lay groundwork for the next meeting

Meeting Map

	Mon	Tues	Wed	Thur	Fri
8:00	SEC	All	All	All - Motions & Closing Business	
8:30					
9:00					
9:30					
10:00					
10:30					
11:00	802.0 Plenary				
11:30					
12:00	Lunch	Lunch	Lunch	Lunch	
12:30					
13:00	802.3 Plenary	All	All	802.3 Plenary	SEC
13:30					
14:00					
14:30					
15:00					
15:30					
16:00					
16:30					
17:00					
17:30					
18:00	Dinner	Break	Dinner		
18:30	Tutorial #1	Tutorial #3	Social		
19:00					
19:30					
20:00	Tutorial #2	Tutorial #4			
20:30					
21:00					
21:30					



Thank You!

