Agenda and General Information

IEEE P802.3bs 400GbE Task Force

John D'Ambrosia, Dell

Atlanta, GA, USA

IEEE 802 Jan 2015 Interim

Agenda

- Appointment of Recording Secretary
- Welcome and Introductions
- Approve Agenda
- Approve Sept 2014 Interim Minutes
- Goals for this meeting
- Reflector and Web
- Patent Policy
- Ground Rules
- IEEE
  - Structure
  - Bylaws and Rules
  - Guidelines for IEEE-SA Meetings
  - IEEE Standards Process
- Project Documentation
- Liaisons & Communications
- Ad Hoc Reports
- Technical Presentations
- Motions and Closing Business
- Future Meetings
- Future Ad Hoc Calls

Task Force Decorum

- Photography or recording by permission only (2010 SASB Op Manual 5.3.3.4)
- Cell phone ringers off
- Press (i.e., anyone reporting publicly on this meeting) are to announce their presence (5.3.3.5)
- Wear your badges at all times in meeting areas
  - Help the hotel security staff improve the general security of the meeting rooms
  - **PCs HAVE BEEN STOLEN** at previous meetings
  - **DO NOT** assume that meeting areas are secure
- Please observe proper decorum in meetings

Goals for the meeting week

- Hear Technical Proposals and supporting presentations

- Address Multiple Technical Key Issues
  - Architecture
  - FEC
  - Electrical Interfaces: 8x50 PAM-4 vs NRZ
  - SMF PMDs
    - # of wavelengths and effective rate per lambda
    - Modulation schemes
    - Commonality between PMDs?

- Decisions, decisions, decisions!

Reflector and Web

- To subscribe to the 400G reflector, send an email to:

  ListServ@ieee.org

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

  subscribe stds-802-3-400G <yourfirstname> <yourlastname>

  end

- Send 400G reflector messages to:

  STDS-802-3-400G@listserv.ieee.org

- Task Force web page URL:

  http://www.ieee802.org/3/bs/index.html

- Ad hoc area URL:

  http://www.ieee802.org/3/bs/public/adhoc/index.shtml

Private Area

- URL: http://www.ieee802.org/3/bs/private/index.html
  - Username: xxxxxx
  - Password: xxxxxx

- Write it down…

- Note - The draft, and any other content, is posted for your review only, and neither the content nor access information should be copied or redistributed to others in violation of document copyrights.

Instructions for the WG Chair

The IEEE-SA strongly recommends that at each WG meeting the chair or a designee:

- **Show slides #1 through #4 of this presentation**
- **Advise the WG attendees that:**
  - The IEEE's patent policy is described in Clause 6 of the *IEEE-SA Standards Board Bylaws*;
  - Early identification of patent claims which may be essential for the use of standards under development is strongly encouraged;
  - There may be Essential Patent Claims of which the IEEE is not aware. Additionally, neither the IEEE, the WG, nor the WG chair can ensure the accuracy or completeness of any assurance or whether any such assurance is, in fact, of a Patent Claim that is essential for the use of the standard under development.

- **Instruct the WG Secretary to record in the minutes of the relevant WG meeting:**
  - That the foregoing information was provided and that slides 1 through 4 (and this slide 0, if applicable) were shown;
  - That the chair or designee provided an opportunity for participants to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) of which the participant is personally aware and that may be essential for the use of that standard
  - Any responses that were given, specifically the patent claim(s)/patent application claim(s) and/or the holder of the patent claim(s)/patent application claim(s) that were identified (if any) and by whom.

- The WG Chair shall ensure that a request is made to any identified holders of potential essential patent claim(s) to complete and submit a Letter of Assurance.
- It is recommended that the WG chair review the guidance in *IEEE-SA Standards Board Operations Manual* 6.3.5 and in FAQs 12 and 12a on inclusion of potential Essential Patent Claims by incorporation or by reference.

  Note: **WG** includes Working Groups, Task Groups, and other standards-developing committees with a PAR approved by the IEEE-SA Standards Board.

◈IEEE

(Optional to be shown)

Participants, Patents, and Duty to Inform

All participants in this meeting have certain obligations under the IEEE-SA Patent Policy.

- **Participants [Note: Quoted text excerpted from IEEE-SA Standards Board Bylaws subclause 6.2]:**
  - **"Shall inform the IEEE (or cause the IEEE to be informed)" of the identity of each "holder of any potential Essential Patent Claims of which they are personally aware" if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents**
    - **"Personal awareness" means that the participant "is personally aware that the holder may have a potential Essential Patent Claim," even if the participant is not personally aware of the specific patents or patent claims**
  - **"Should inform the IEEE (or cause the IEEE to be informed)" of the identity of "any other holders of such potential Essential Patent Claims" (that is, third parties that are not affiliated with the participant, with the participant's employer, or with anyone else that the participant is from or otherwise represents)**
- **The above does not apply if the patent claim is already the subject of an Accepted Letter of Assurance that applies to the proposed standard(s) under consideration by this group**
- **Early identification of holders of potential Essential Patent Claims is strongly encouraged**
- **No duty to perform a patent search**

25 March 2008 (updated January 2012)

◆IEEE

Patent Related Links

All participants should be familiar with their obligations under the IEEE-SA Policies & Procedures for standards development.

Patent Policy is stated in these sources:

IEEE-SA Standards Boards Bylaws

http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6

IEEE-SA Standards Board Operations Manual

http://standards.ieee.org/develop/policies/opman/sect6.html#6.3

Material about the patent policy is available at

http://standards.ieee.org/about/sasb/patcom/materials.html

If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org or visit http://standards.ieee.org/about/sasb/patcom/index.html

This slide set is available at https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.ppt

IEEE

25 March 2008 (updated January 2012)

Call for Potentially Essential Patents

- If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance:

  - Either speak up now or
  - Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible or
  - Cause an LOA to be submitted

◈IEEE

Other Guidelines for IEEE WG Meetings

- **All IEEE-SA standards meetings shall be conducted in compliance with all applicable laws, including antitrust and competition laws.**

  - **Don't discuss the interpretation, validity, or essentiality of patents/patent claims.**

  - **Don't discuss specific license rates, terms, or conditions.**

    - Relative costs, including licensing costs of essential patent claims, of different technical approaches may be discussed in standards development meetings.

      - Technical considerations remain primary focus

  - **Don't discuss or engage in the fixing of product prices, allocation of customers, or division of sales markets.**

  - **Don't discuss the status or substance of ongoing or threatened litigation.**

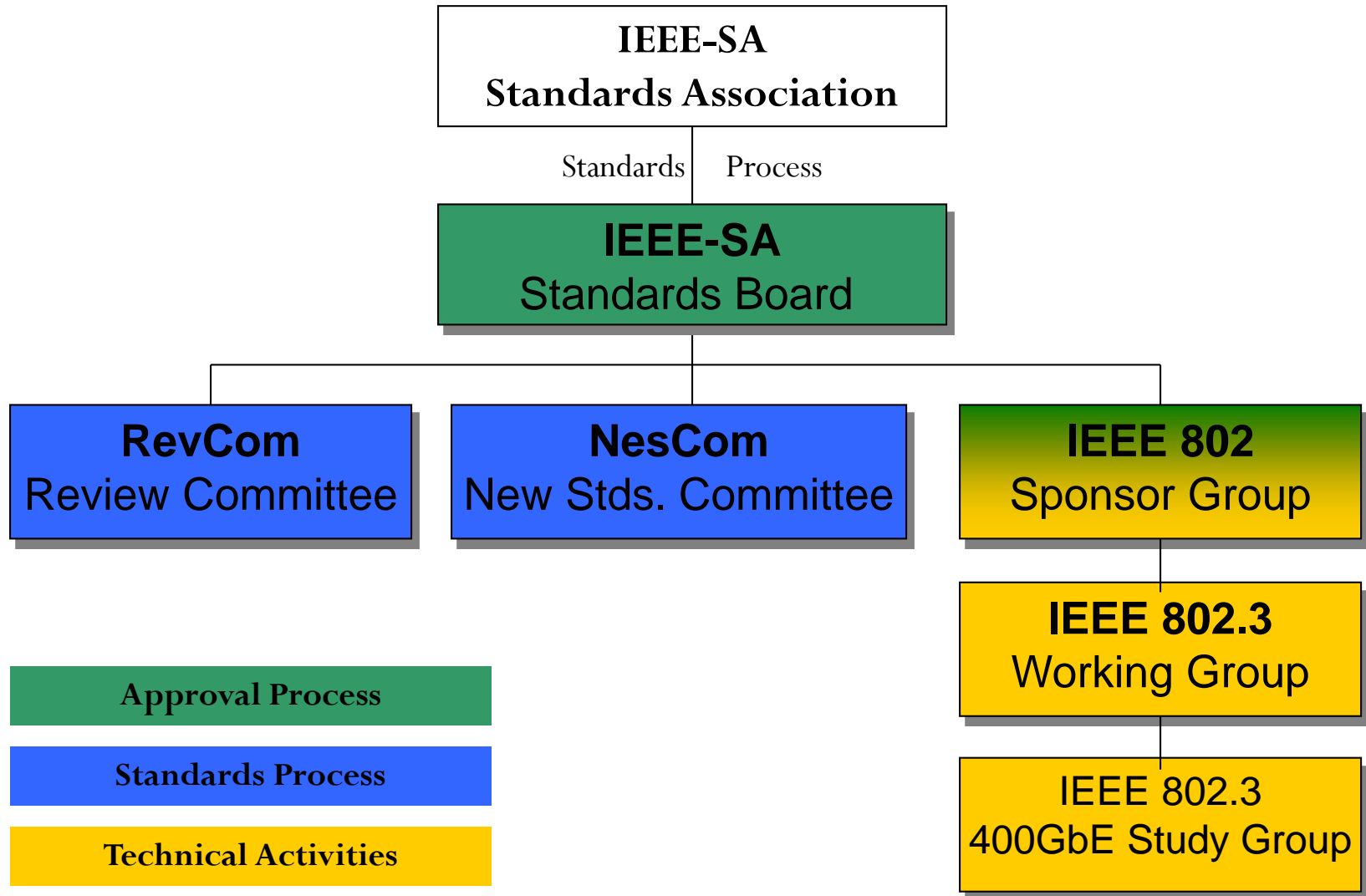 - **Don't be silent if inappropriate topics are discussed … do formally object.**

  See *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and "Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy" for more details.

IEEE

Ground Rules

- Based upon IEEE 802.3 Rules
  - Foundation based upon Robert's Rules of Order
  - Anyone in the room may speak
  - Anyone in the room may vote
- **RESPECT**… give it, get it
- NO product pitches
- NO corporate pitches
- NO prices!!!
  - This includes costs, ASPs, etc. no matter what the currency
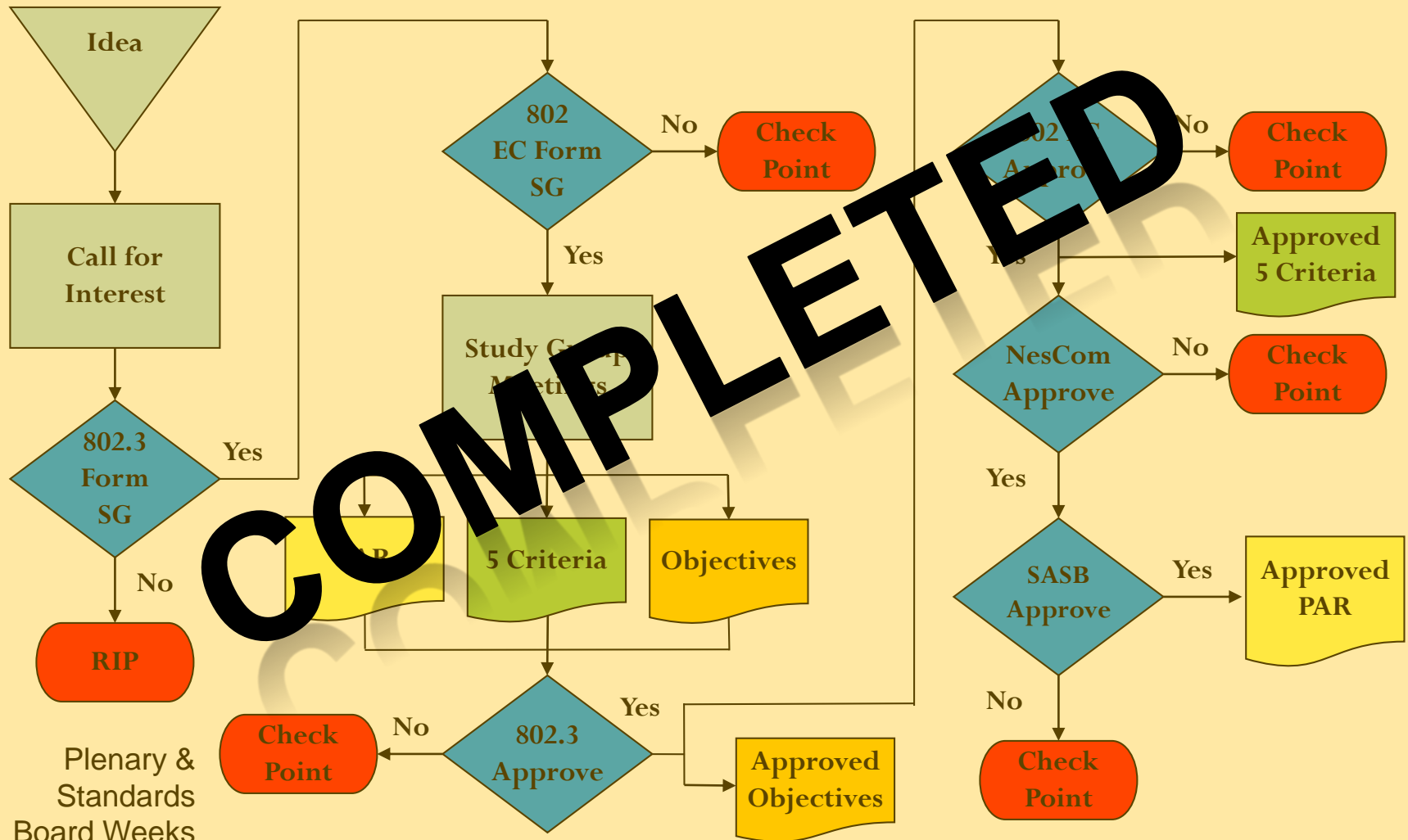- NO restrictive notices

IEEE Structure

IEEE-SA
Standards Association

Standards | Process

IEEE-SA
Standards Board

RevCom
Review Committee

NesCom
New Stds. Committee

IEEE 802
Sponsor Group

IEEE 802.3
Working Group

IEEE 802.3
400GbE Study Group

Approval Process

Standards Process

Technical Activities

Important Bylaws, Rules, & References

- **IEEE-SA Operations Manual**
  http://standards.ieee.org/sa/sa-om.pdf

- **IEEE-SA Standards Board Bylaws**
  http://standards.ieee.org/guides/bylaws/sb-bylaws.pdf

- **IEEE-SA Standards Board Operations Manual**
  http://standards.ieee.org/guides/opman/sb-om.pdf

- **IEEE 802 LAN/MAN Standards Committee (LMSC) Policies and Procedures**
  http://standards.ieee.org/about/sasb/audcom/pnp/LMSC.pdf

- **IEEE 802 LAN/MAN Standards Committee (LMSC) Operations Manual**
  http://www.ieee802.org/PNP/2010-07/IEEE_802_LMSC_OM_approved_100716.pdf

- **IEEE 802 LAN/MAN Standards Committee (LMSC) Working Group (WG) Policies and Procedures**
  http://www.ieee802.org/PNP/2010-07/IEEE_802_LMSC_WG_PandP_approved_100716.pdf

- **IEEE 802.3 Working Group Operating Rules**
  http://ieee802.org/3/rules/P802_3_rules.pdf

- **"Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy"**
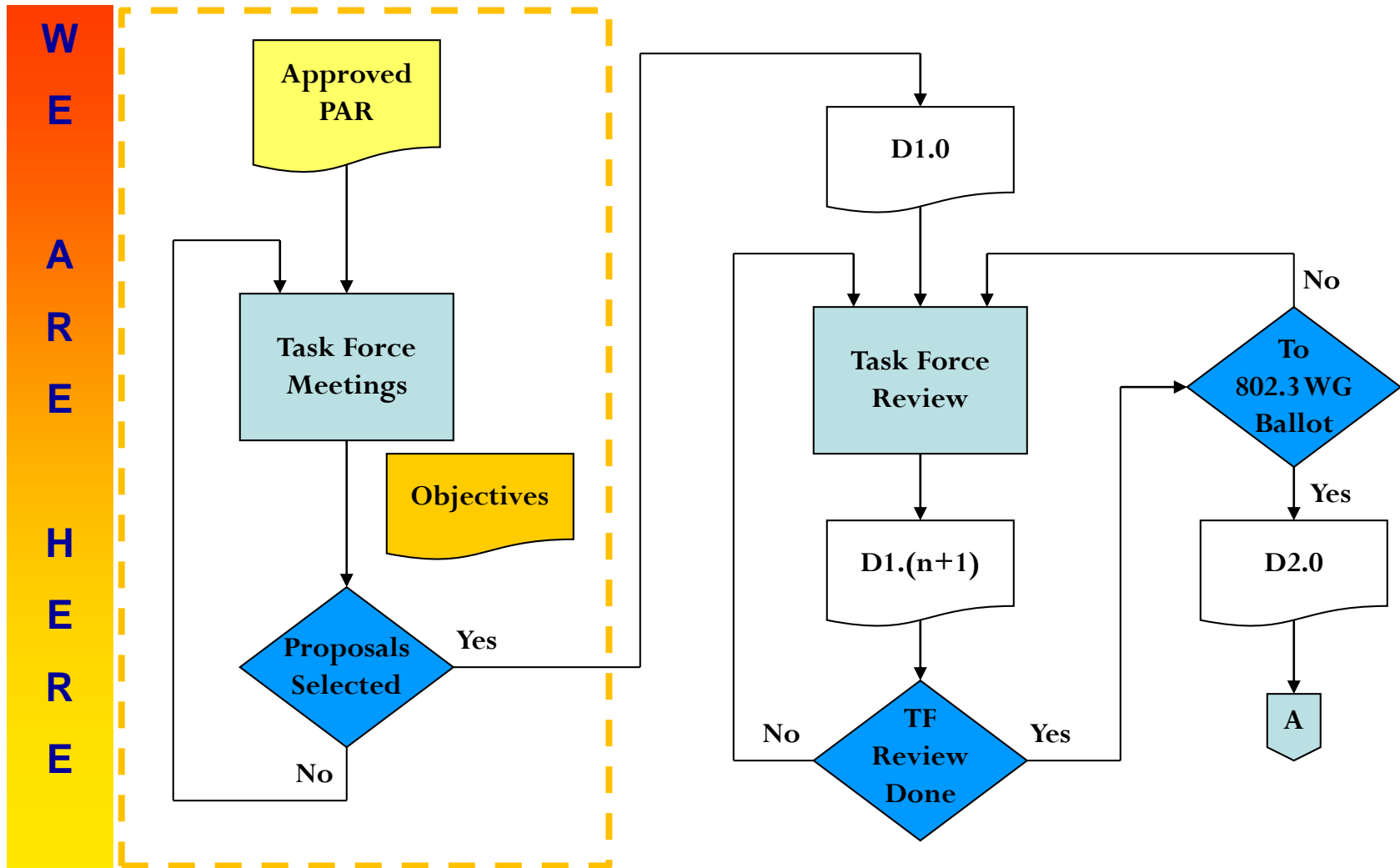 http://standards.ieee.org/develop/policies/antitrust.pdf

Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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

Overview of IEEE 802.3 Standards Process (3/5) – Working Group Ballot Phase

Notes: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.
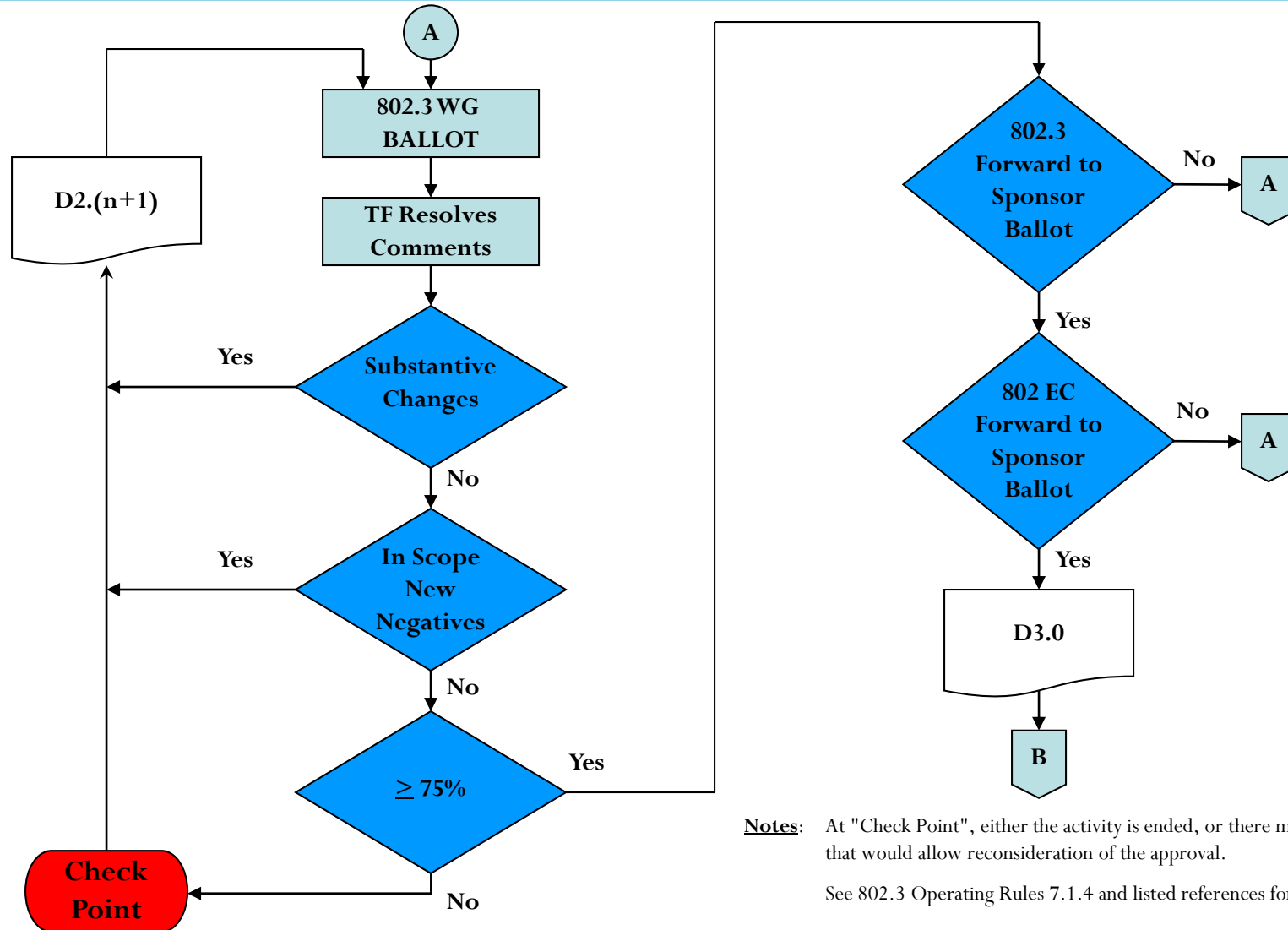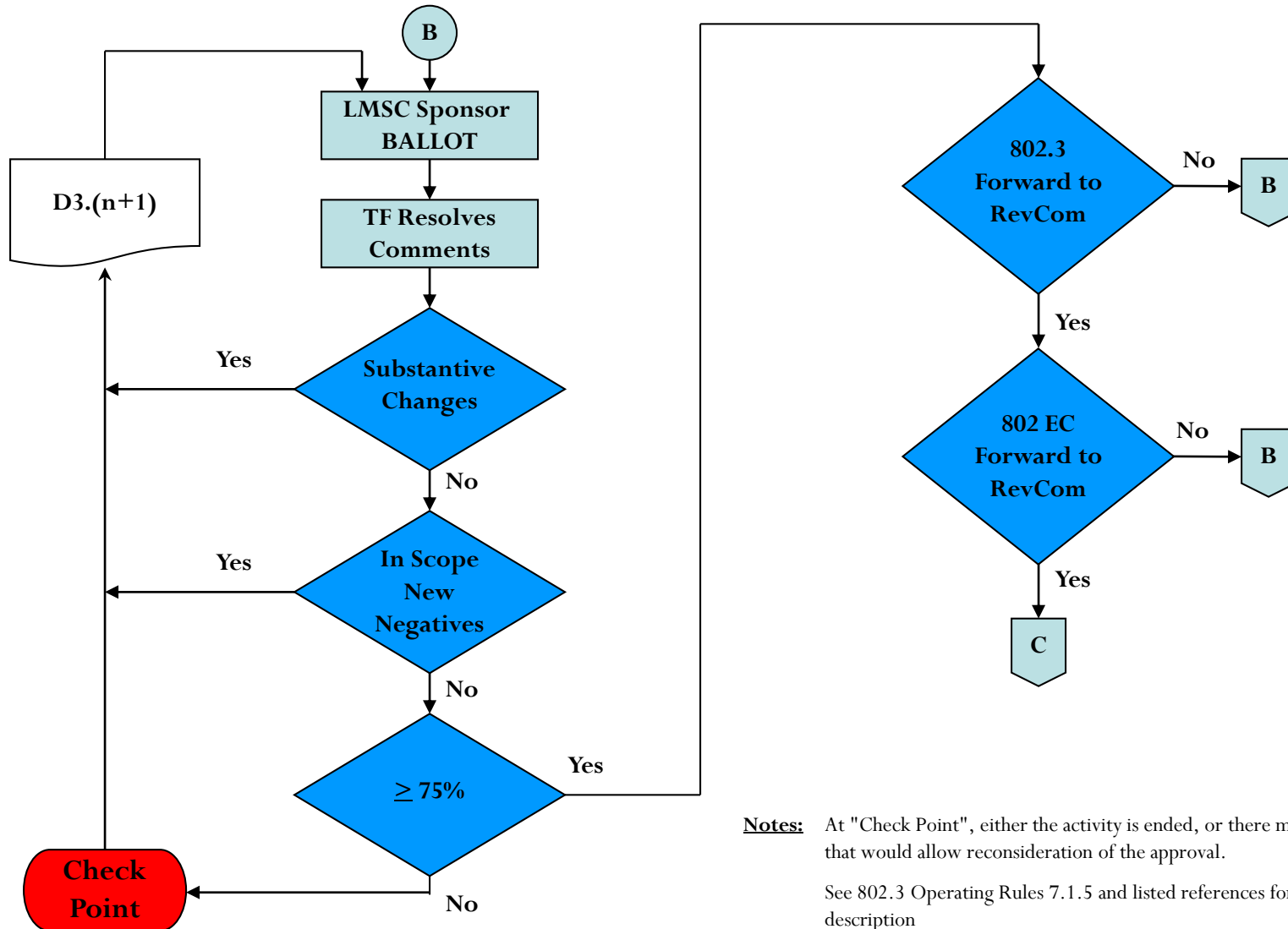
See 802.3 Operating Rules 7.1.4 and listed references for complete description

Overview of IEEE 802.3 Standards Process (4/5)- Sponsor Ballot Phase

B

LMSC Sponsor BALLOT

TF Resolves Comments

D3.(n+1)

Substantive Changes — **Yes**

No

In Scope New Negatives — **Yes**

No

≥ 75% — **Yes**

No

Check Point

802.3 Forward to RevCom — **No** → **B**

Yes

802 EC Forward to RevCom — **No** → **B**

Yes

C

Notes: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

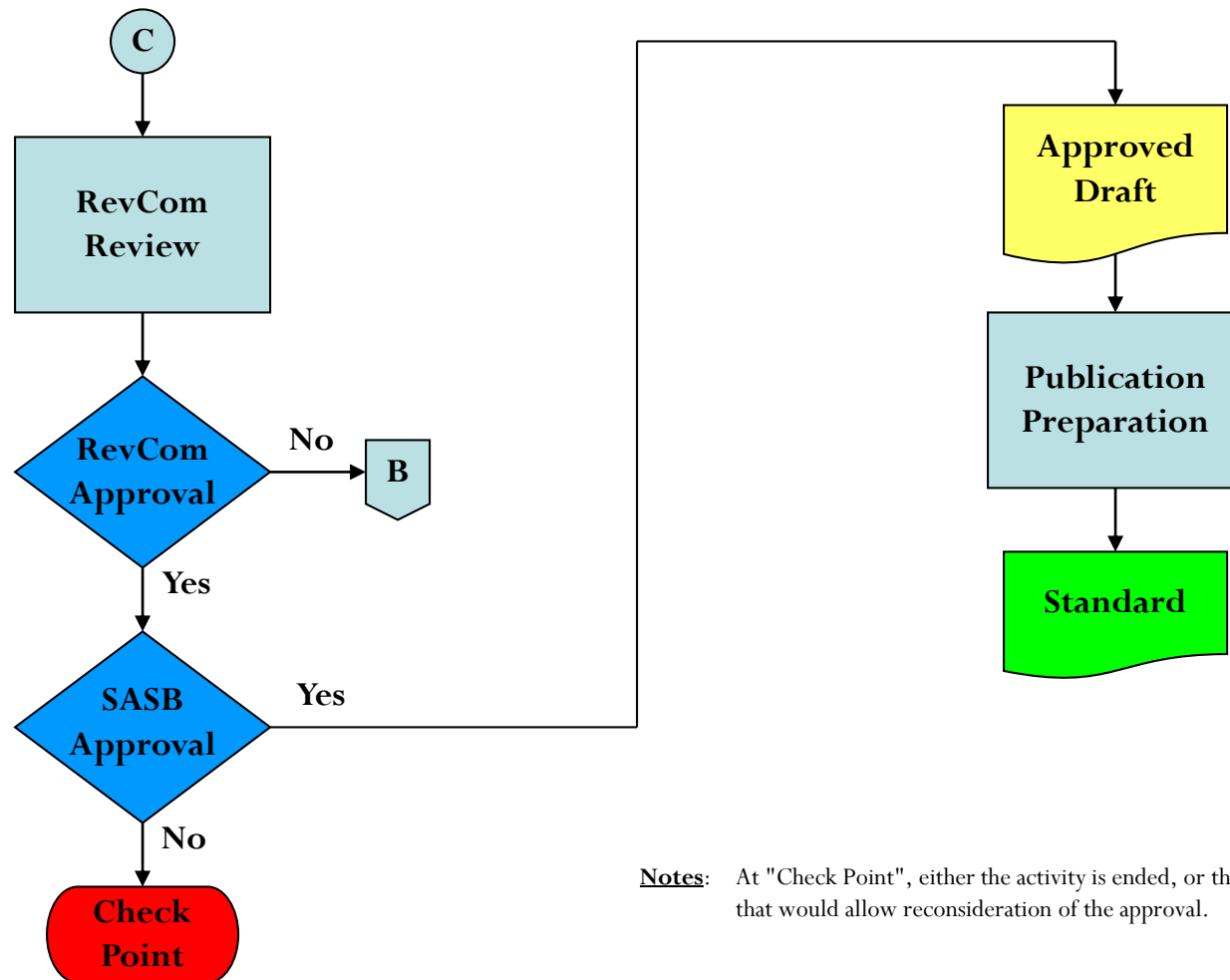See 802.3 Operating Rules 7.1.5 and listed references for complete description

Overview of IEEE 802.3 Standards Process (5/5) – Final Approvals / Standard Release

Notes: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

Project Documentation

- **PAR -**

  http://www.ieee802.org/3/bs/PAR_P802.3bs_14_0612.pdf

- **CSD -**

  http://www.ieee802.org/3/bs/CSD_400_14_0121.pdf

- **Objectives -**

  http://www.ieee802.org/3/bs/Objectives_14_0320.pdf

- **Timeline -**

  http://www.ieee802.org/3/bs/timeline_3bs_0514.pdf

Project Objectives

- Support a MAC data rate of 400 Gb/s

- Support a BER of better than or equal to 10^{-13} at the MAC/PLS service interface (or the frame loss ratio equivalent)

- Support full-duplex operation only

- Preserve the Ethernet frame format utilizing the Ethernet MAC

- Preserve minimum and maximum FrameSize of current Ethernet standard

- Provide appropriate support for OTN

- Specify optional Energy Efficient Ethernet (EEE) capability for 400 Gb/s PHYs

- Support optional 400 Gb/s Attachment Unit Interfaces for chip-to-chip and chip-to-module applications

- Provide physical layer specifications which support link distances of:
  - At least 100 m over MMF
  - At least 500 m over SMF
  - At least 2 km over SMF
  - At least 10 km over SMF

Liaisons and Communications

- Nov Meeting OIF – Progress on OIF CEI-56G Projects
    - http://www.ieee802.org/3/bs/public/14_11/OIF_Liaison_CEI56G_Progress_28Oct14.pdf

Ad Hocs

- Webpage: Ad Hoc
  - http://www.ieee802.org/3/bs/public/adhoc/index.shtml

- Ad Hocs
  - Logic, Chair – Mark Gustlin
  - Use Case, Chair – Gary Nicholl
  - SMF, Chair – Pete Anslow
  - MMF, Chair – Jonathan King
  - Electrical Interface, Co-chair – Joel Goergen, Co-chair – Vasu Parthasarathy

Ad Hoc Reports

- ## Logic, Chair – Mark Gustlin

  - http://www.ieee802.org/3/bs/public/15_01/gustlin_3bs_01_0115.pdf

- ## SMF, Chair – Pete Anslow

  - http://www.ieee802.org/3/bs/public/15_01/anslow_3bs_01_0115.pdf

- ## Electrical Interface, Co-chair – Joel Goergen, Co-chair – Vasu Parthasarathy

  - To be added

Wednesday

Time	Presenter	Affiliation	Title	File Name
1:00 PM	John D'Ambrosia	Dell	Agenda and General Information	agenda_3bs_01_0115
1:30 PM	John D'Ambrosia	Dell	Moving Forward	dambrosia_3bs_01_0115
2:00 PM	Mark Gustlin	Xilinx	400GbE PCS Baseline Proposal	gustlin_3bs_02_0115
2:30 PM	Jeff Slavick	Avago Technologies	PMA Muxing Considerations	slavick_3bs_01_0115
2:55 PM	Break			
3:10 PM	Tongtong Wang	Huawei	An Alternative Scheme of FOM Bit Mux with Pre-interleave	wang_t_3bs_01_0115
3:35 PM	John D'Ambrosia	Dell	Architecture Update	dambrosia_3bs_02_0115
4:05 PM	Arthur Marris	Cadence	Energy Efficient Ethernet (EEE) for 802.3bs	marris_3bs_01_0115
4:25 PM	Steve Trowbridge	Alcatel-Lucnt	OTN Support Proposal	trowbridge_3bs_01_0115
4:50 PM	Martin Langhammer	Altera	Updated Models - FEC Cores	langhammer_3bs_01_0115
5:10 PM	Mark Gustlin	Xilinx	Relative FEC Area Comparison	gustlin_3bs_03_0115
5:30 PM	Lunch			
6:45 PM	Xinyuan Wang	Huawei	Investigation on Technical Feasibility of Stronger RS FEC for 400GbE	wang_x_3bs_01_0115
7:15 PM	Mike Li	Altera	Baseline Proposal for CDAUI-8 Chip-to-Chip (c2c)	li_3bs_01_0115
7:45 PM	David Brown	Semtech	Draft Baseline Proposal for CDAUI-8 Chip-to-Module (c2m) Electrical Interface	brown_3bs_01_0115
8:15 PM	Paul Brooks	JDSU	Test equipment considerations for 400G early implementations	brooks_3bs_01_0115
8:40 PM	Discussion, Strawpolls (Time Permitting)			
9:00 PM	Break			

Thursday

All times listed are subject to change.

8:30 AM	John D'Ambrosia	Dell	Opening Comments	
8:40 AM	Piers Dawe	Mellanox	Summary of NRZ CDAUI proposals	dawe_3bs_01_0115
9:10 AM	Haoi Qian	Credo	56Gbps Modulation -NRZ Measurement data in support of C2M and C2C	qian_3bs_01_0115
9:35 AM	Tom Palkert	MoSys	Proposed Baseline text for: Chip-to-module 400Gb/s eight-lane Attachment Unit Interface (CDAUI-8)	palkert_3bs_01_0115
10:05 AM	Break			
10:25 AM	Tom Palkert	MoSys	Proposed Baseline text for: Chip-to-chip 400Gb/s eight-lane Attachment Unit Interface (CDAUI-8)	palkert_3bs_02_0115
10:55 AM	Brian Welch	Luxtera	400G-PSM4: A Proposal for the 500m Objective using 100 Gbps per Lane Signaling	welch_3bs_01_0115
11:15 AM	David Lewis	JDSU	Proposal for 400GE Optical PMD for 2km SMF Objective based on 4 x 100G PAM4modulation	lewis_3bs_01_0115
12:00 PM	Lunch			
1:00 PM	Chris Cole	Finisar	400Gb/s 2km & 10km duplex SMF NRZ PMD Nominal	cole_3bs_01_0115
1:30 PM	Chris Cole	Finisar	2. 400Gb/s 2km & 10km duplex SMF PAM-4 PMD Nominal Specifications	cole_3bs_02_0115
1:50 PM	Keisuke Kojima	Mitsubishi	Baseline Proposal for 8 x 50G NRZ for 400GbE 2km and 10km PMD	kojima_3bs_01_0115
2:10 PM	Sacha Corbeil	JDSU	400GE DMT Multi-Vendor Interoperability Requirements	corbeil_3bs_01_0115.pdf
2:40 PM	Michael Vitic	JDSU	2 km SMF 400 Gb/s live traffic results using DMT test chips	vitic_3bs_01_0115.pdf
3:00 PM	Break			
3:20 PM	Toshiki Tanaka	Fujitsu	400GbE DMT Tolerance to MPI using DMT Test Chip	tanaka_3bs_01_0115
3:50 PM	Yangjing Wen	Huawei	Experimental Demonstration of 56Gbps NRZ for 400GbE 2km and 10km PMD Using 100GbE Tx & Rx with Rx EQ	wen_3bs_01_0115
4:15 PM	Peter Stassar	Huawei	Further considerations on 400Gb/s Ethernet SMF PMDs	stassar_3bs_01_0115
4:45 PM	Brian Welch	Luxtera	100 Gbps/λ vs. 50 Gbps/λ: Cost and Power Comparisons in	welch_3bs_02_0115
5:15 PM	Break			
5:30 PM	Ram Rao	Oclaro	4l x 100G and 8l x 50G Power Consumption Comparison for 400G	rao_3bs_01_0115
6:00 PM	Riu Hirai	Hitachi	Investigation of PAPR Penalty on PAM4 Signaling	hirai_3bs_01_0115
6:25 PM	Winston Way	Neophotonics	Improved Results for both 56 and 112Gb/s PAM4 Signals	way_3bs_01_0115
6:50 PM	Discussion, Strawpolls (Time Permitting)			
7:00 PM	Break for day			

Friday

8:30 AM	John D'Ambrosia	Dell	Opening Comments	
8:40 AM	Yoshiaki Sone	NTT	Technology adoption scenarios for 2km and 10km SMF PMDs	sone_3bs_01_0115
9:05 AM	Gary Nicholl	Cisco Systems	Support for a Single Electrical Modulation Scheme from a System Perspective	nicholl_3bs_01_0115
9:35 AM	David Ofelt	Juniper	The Architecture is a Deliverable	ofelt_3bs_01_0115
10:00 AM	Break			
10:20 AM	Motions (May include discussion and strawpolls)			
12:00 PM	Lunch			
1:00 PM	Motions (May include discussion and strawpolls)			
3:00 PM	Break			
3:15 PM	Motions (May include discussion and strawpolls)			
4:10 PM	Closing Business			
4:30 PM	Adjourn			

Future Meetings

- See: http://www.ieee802.org/3/interims/index.html
- Mar 2015 Plenary
  - Week of Mar 8
  - Estrel Hotel and Convention Center, Berlin, Germany
- May 2015 Interim
  - Week of May 18, 2015
  - Omni William Penn Hotel, Pittsburgh, PA, USA
  - Hosted by Ethernet Alliance
- July 2015 Plenary
  - Week of July 12
  - Hilton Waikoloa Village, Waikoloa, Hawaii USA
- Sept 2015 Interim
  - Week of Sept 14
  - Hyatt Regency Coconut Point, Bonita Springs, FL, USA
  - Hosted by NEC
- Nov 2015 Plenary
  - Week of Nov 8
  - Hyatt Regency Dallas, Dallas, TX, USA

- Anyone interested in hosting a meeting or webex contact me.

Future Ad Hoc Calls (Tenative)

- To be added

Note –Dates / times listed
are subject to change.

Thank You!

IEEE P802.3bs 400 GbE Task Force, IEEE 802 Jan 2015 Interim, Atlanta, GA, USA