

# Agenda and General Information

IEEE P802.3bs 400GbE Task Force

John D'Ambrosia, Dell  
San Diego, CA, USA  
IEEE 802 July 2014 Plenary

# Agenda

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- Appointment of Recording Secretary
- Welcome and Introductions
- Approve Agenda
- Approve May 2014 Plenary 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

# Task Force Decorum

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- 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

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- Hear Technical Presentations / Proposals
- Identify Steps Moving Forward
- Address Multiple Technical Key Issues
  - Architecture
  - FEC
  - Electrical Interfaces: 16x25 vs 8x50 vs both
  - MMF PMDs (no presentations)
  - SMF PMDs
    - # of wavelengths and effective rate per lambda
    - Modulation schemes
    - Commonality between PMDs?

# Attendance

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- Tutorial Material on attendance tool
  - [http://ieee802.org/3/minutes/attendance\\_procedures.pdf](http://ieee802.org/3/minutes/attendance_procedures.pdf)
- Access details
  - URL: <http://imat.ieee.org/>
  - (For plenary) Password will be provided

# Reflector and Web

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

[ListServ@ieee.org](mailto: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](mailto: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>

# 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.



# 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



# 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](mailto: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>

# 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

# 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.**

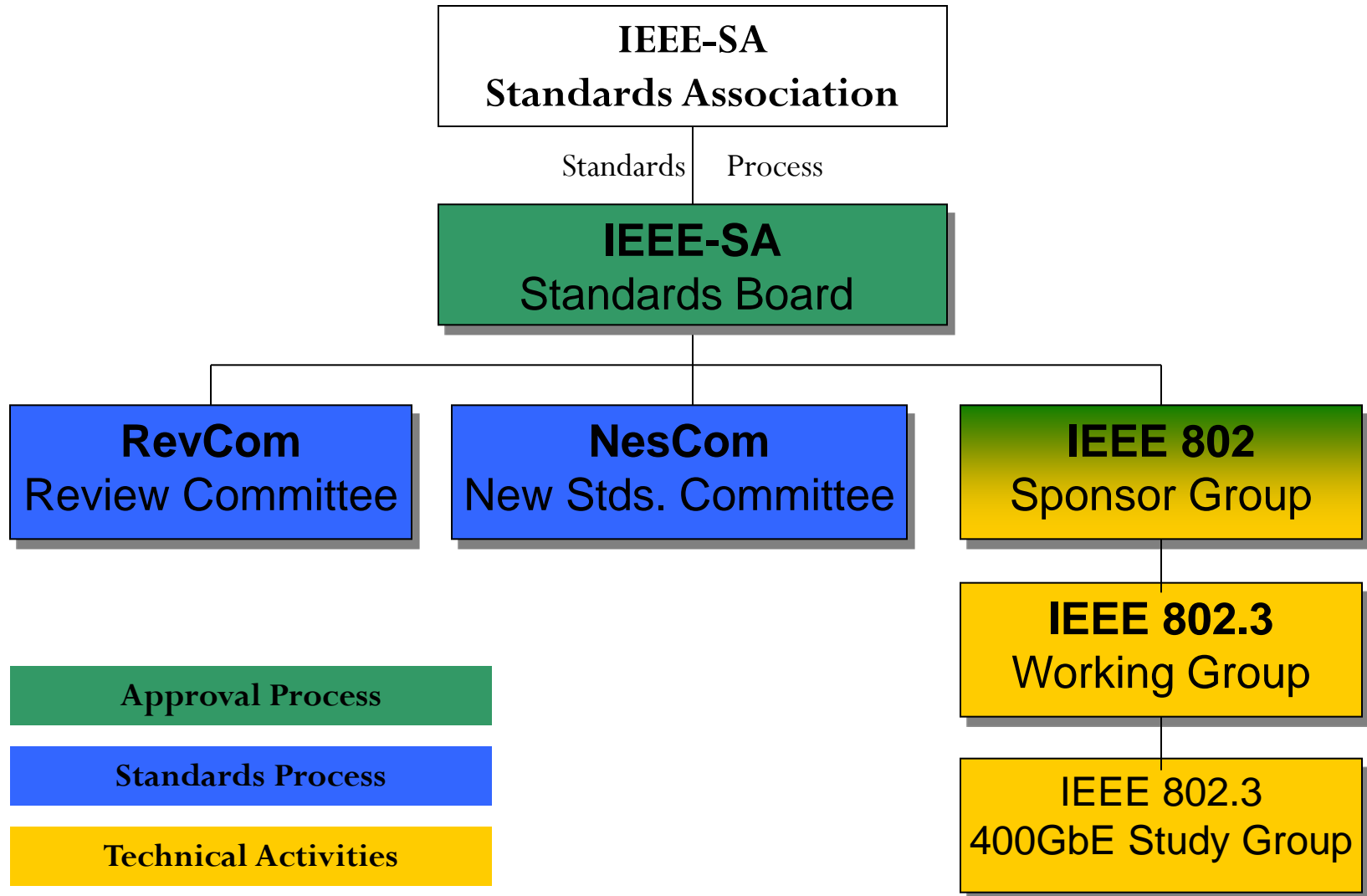
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See *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and “Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy” for more details.

# Ground Rules

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- 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

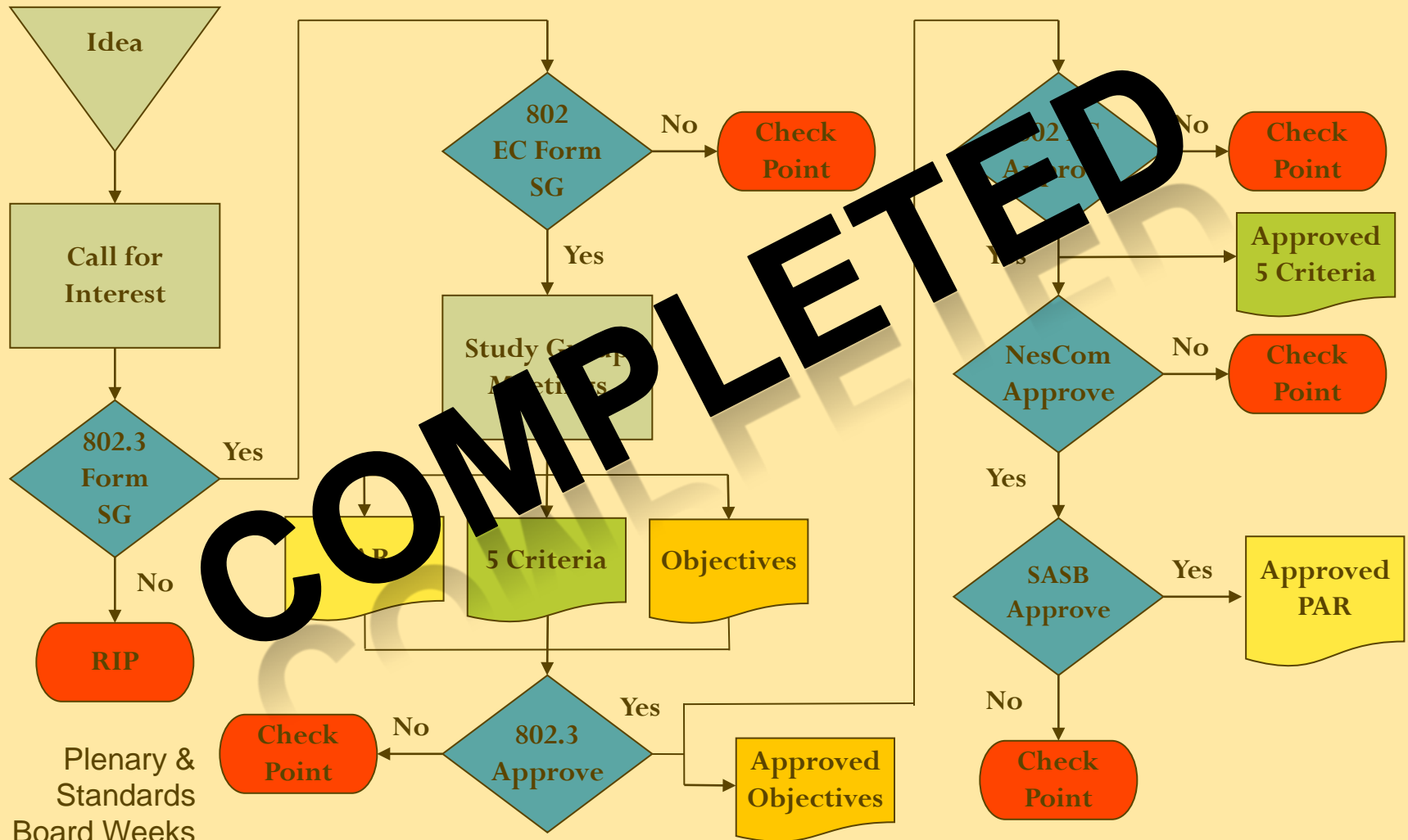


# Important Bylaws, Rules, & References

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- **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](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](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](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>

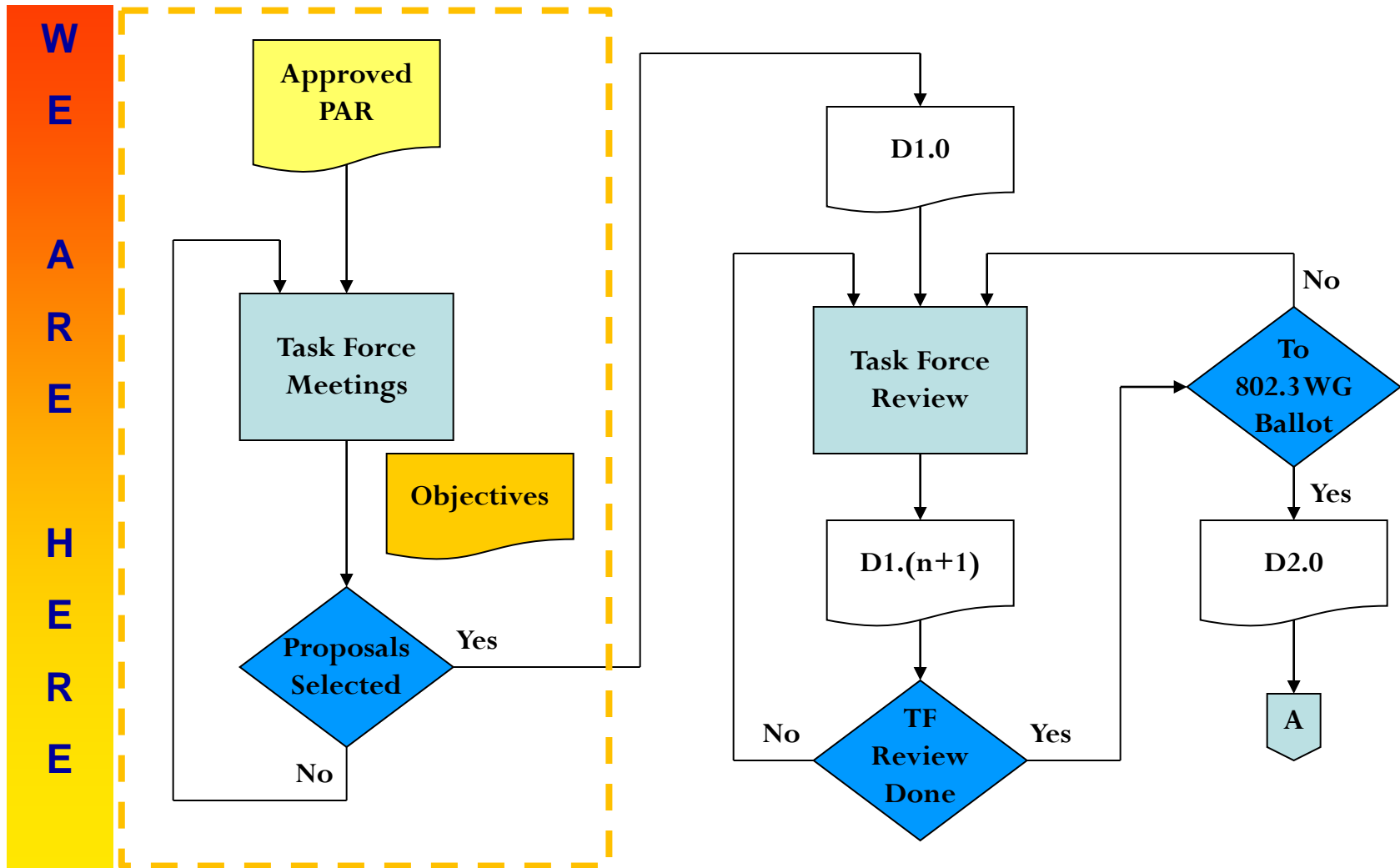
# Overview of IEEE 802.3 Standards Process (1/5)- Study Group Phase



**COMPLETED**

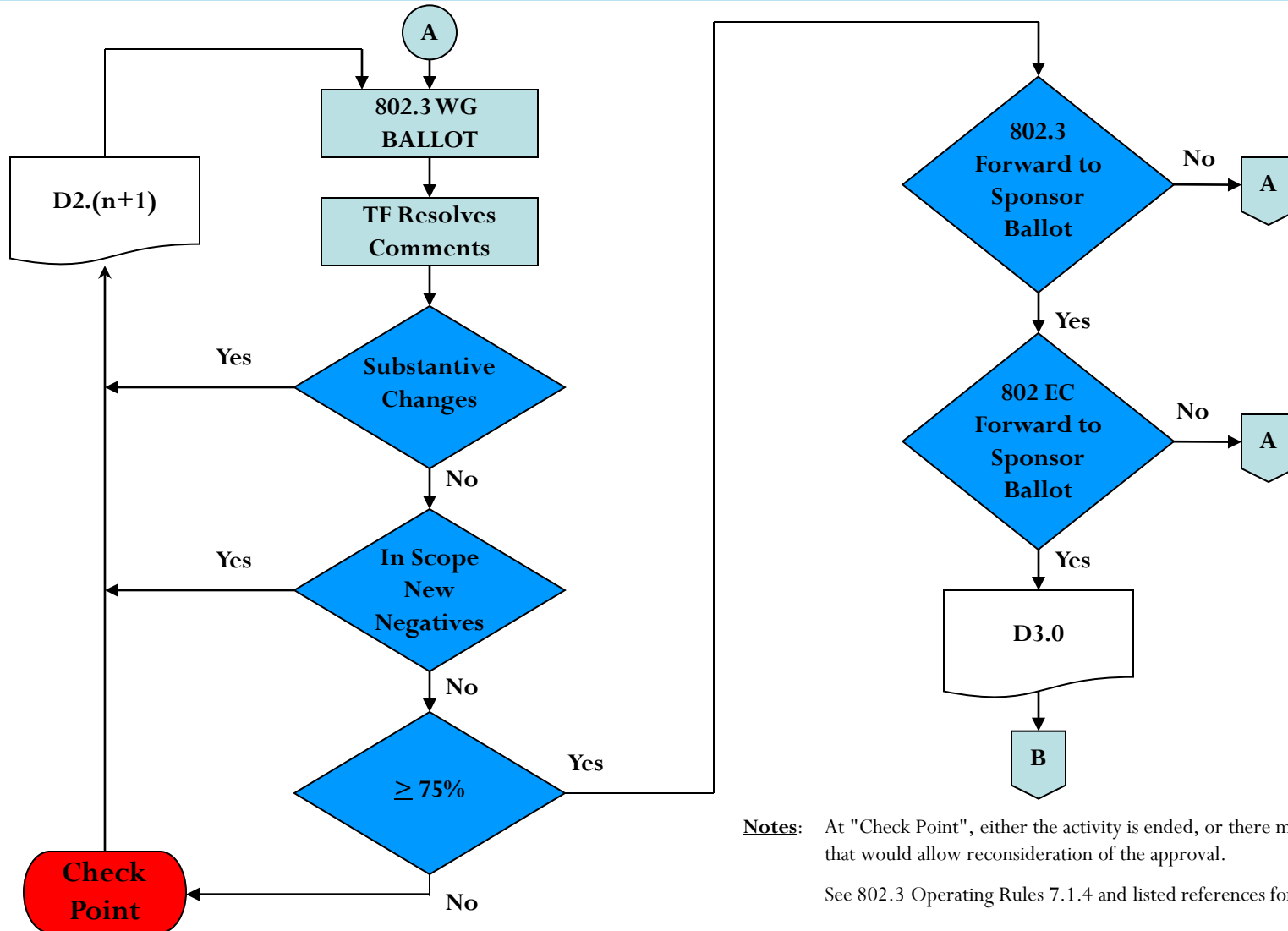
Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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





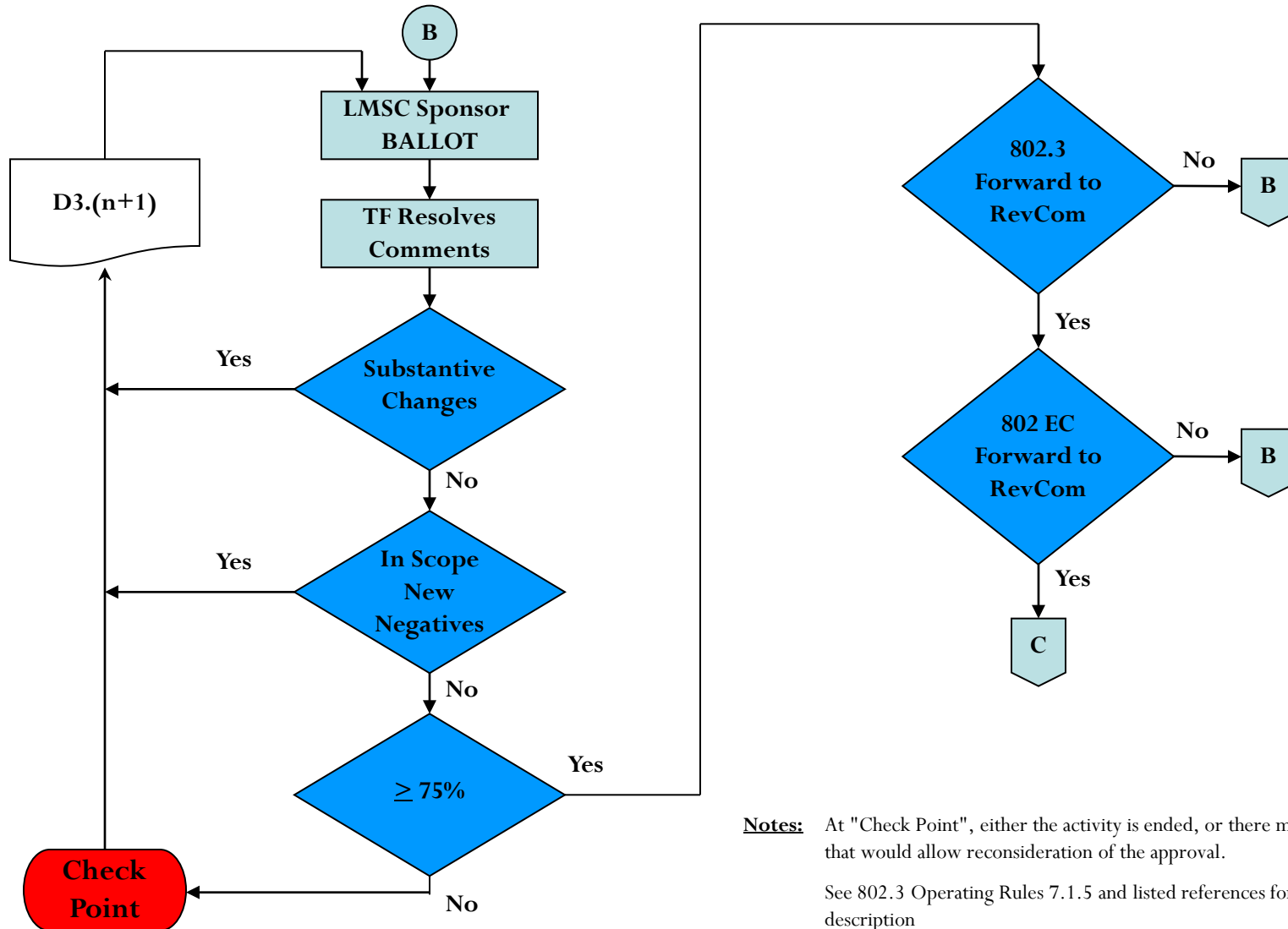
# Overview of IEEE 802.3 Standards Process (3/5) – Working Group Ballot Phase



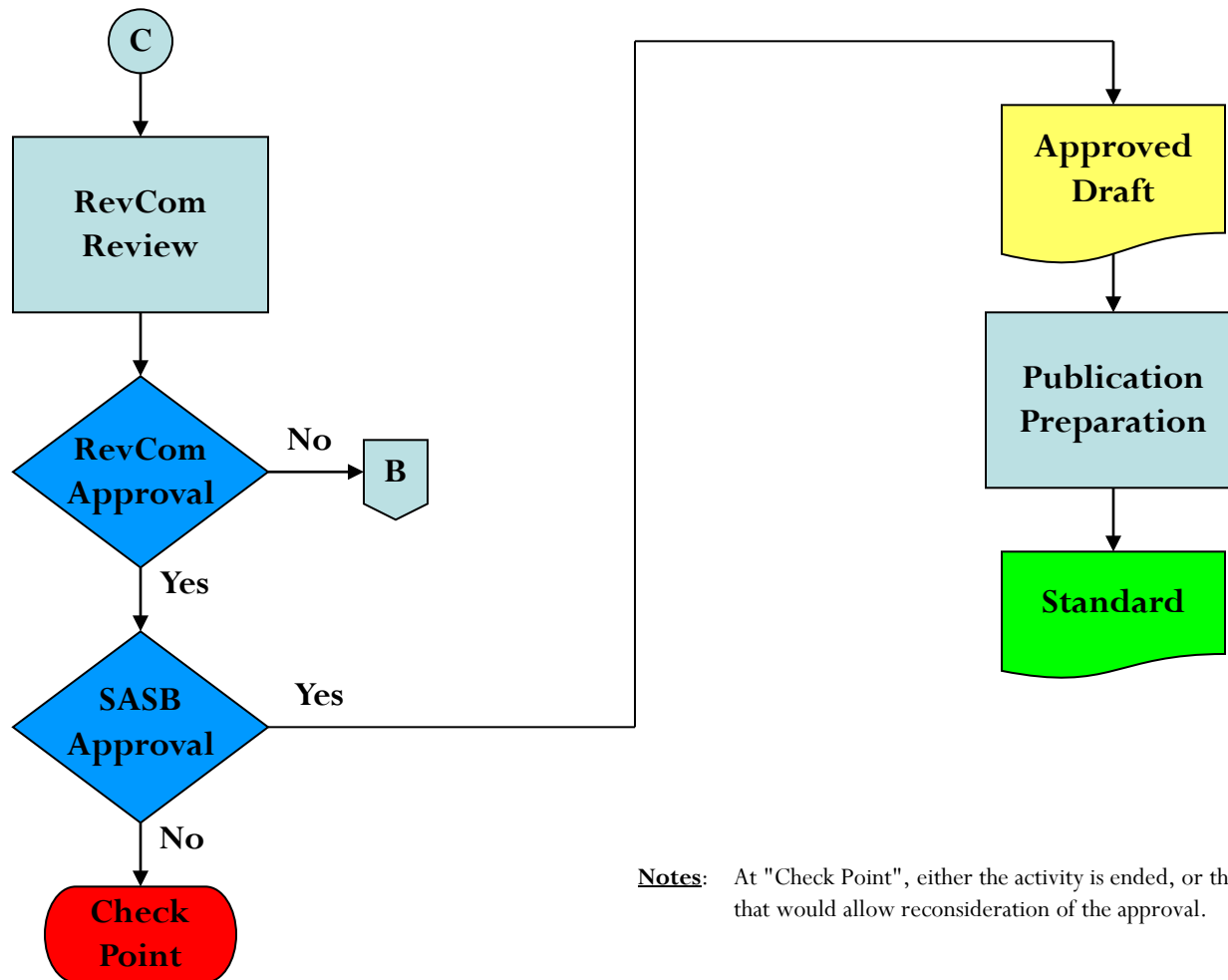
**Notes:** At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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



# 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

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- PAR - [http://www.ieee802.org/3/bs/PAR\\_P802.3bs\\_14\\_0612.pdf](http://www.ieee802.org/3/bs/PAR_P802.3bs_14_0612.pdf)
- CSD - [http://www.ieee802.org/3/bs/CSD\\_400\\_14\\_0121.pdf](http://www.ieee802.org/3/bs/CSD_400_14_0121.pdf)
- Objectives - [http://www.ieee802.org/3/bs/Objectives\\_14\\_0320.pdf](http://www.ieee802.org/3/bs/Objectives_14_0320.pdf)
- Timeline - [http://www.ieee802.org/3/bs/timeline\\_3bs\\_0514.pdf](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

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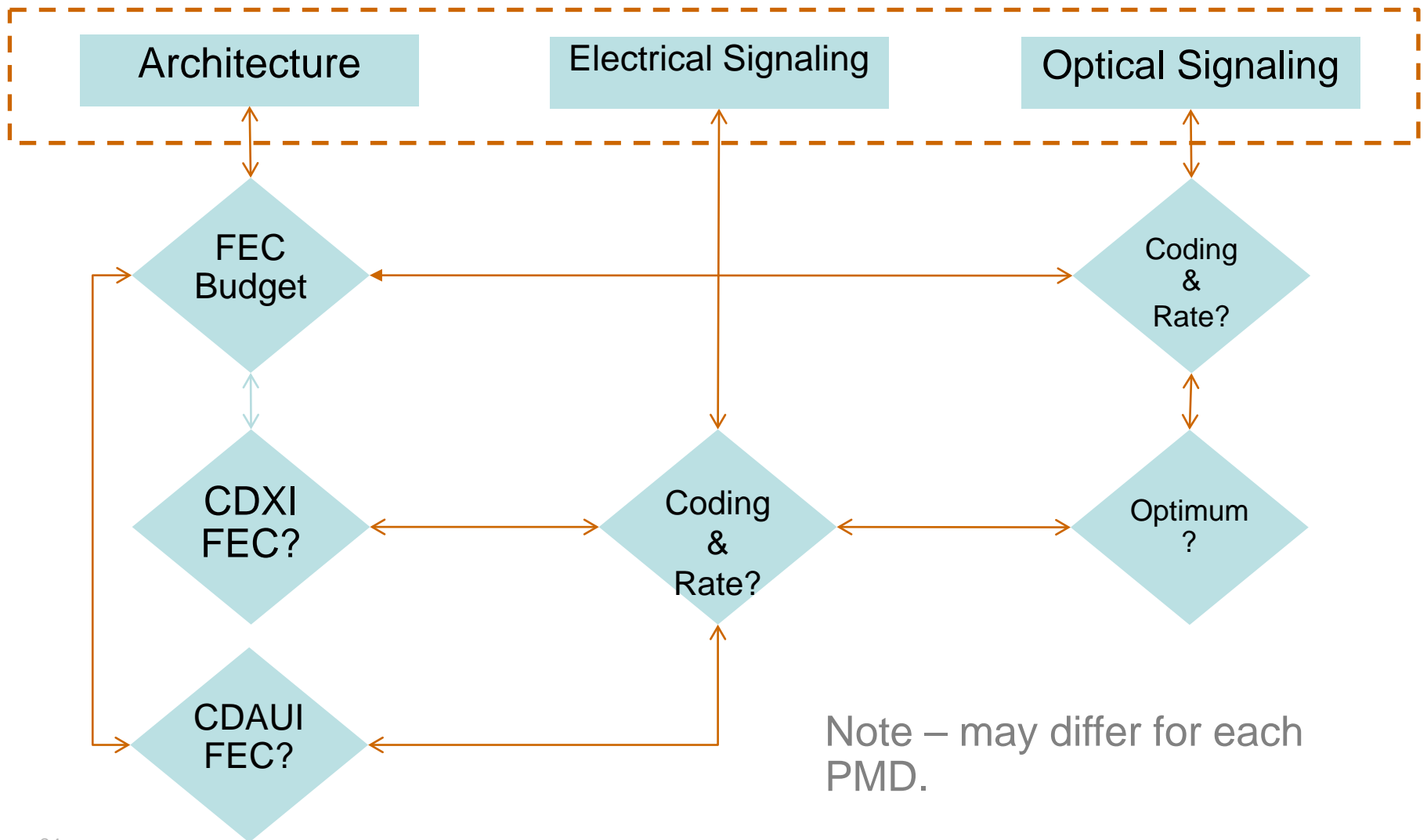
- Consider response from OIF on CEI-56G projects
  - [http://www.ieee802.org/3/minutes/jul14/incoming/OIF\\_to\\_IEEE\\_P802d3bs\\_May\\_2014.pdf](http://www.ieee802.org/3/minutes/jul14/incoming/OIF_to_IEEE_P802d3bs_May_2014.pdf)

# Ad Hoc Report

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- Webpage: Ad Hoc
  - <http://www.ieee802.org/3/bs/public/adhoc/index.shtml>
- Ad Hoc
  - Task Force Call
  - Logic
  - Use Case
  - SMF
  - MMF

# Interrelations Between Technical Decisions





# Tuesday

Notes – Tues Start time pending completion of 802.3bm. All times listed are subject to change.

Time	Presenter	Affiliation	Title	File Name
10:30 AM	John D'Ambrosia	Dell	Agenda and General Information	agenda_3bs_01_0714.pdf
10:50 AM	Nathan Tracy	TE Connectivity	OIF CEI-56G-USR, XSR, VSR, MR Projects	OIF_to_IEEE_P802d3bs_May_2014.pdf
10:55 AM	Mark Gustlin	Xilinx	A 400GbE Architectural Option	gustlin_3bs_02_0714.pdf
11:15 AM	Mark Gustlin	Xilinx	400GbE MII Baseline Proposal	gustlin_3bs_03_0714.pdf
11:35 AM	Mark Gustlin	Xilinx	400GbE PCS Options	gustlin_3bs_04_0714.pdf
12:00 PM	Lunch			
1:00 PM	Tongtong Wang	Huawei	BER/FLR Calculation Result for Multiplexing in PMA	wang_t_3bs_01_0714.pdf
1:20 PM	Pete Anslow	Ciena	FEC performance on multi-part links	anslow_3bs_02_0714.pdf
1:50 PM	Xinyuan Wang	Huawei	FOM Bit mux, Architecture, Challenge and Solution	wang_x_3bs_01_0714.pdf
2:10 PM	Steve Trowbridge	Alcatel-Lucent	OTN Support Update	trowbridge_3bs_01_0714.pdf
2:30 PM	Pete Anslow	Ciena	PAM4 test pattern characteristics	anslow_3bs_03_0714.pdf
2:45 PM	Haoli Qian	Credo Semi	56Gb/s NRZ Electrical Interface Signaling	qian_3bs_01_0714.pdf
3:05 PM	Break			
3:20 PM	Yuval Domb	Broadcom	Feasibility study of 50G PAM4 Serdes for the chip-to-	domb_3bs_01_0714.pdf
3:50 PM	Mike Li	Altera	A CDAUI-16 Chip-to-Chip (c2c) and Chip-to-Module (c2m) Specification Proposal	li_3bs_01_0714.pdf
4:20 PM	Rich Mellitz	Intel	CDAUI-8 50Gb/s Mezzanine Chip to Chip Channels	mellitz_3bs_01_0714.pdf
4:40 PM	Brian Welch	Luxtera	400G-PSM4, Options for 500m Reach Interconnects	welch_3bs_01_0714.pdf
5:10 PM	Ali Ghiasi	Ghiasi Quantum LLC	Path to consensus on 400 GbE PMDs	ghiasi_3bs_01_0714.pdf
5:30 PM	Break for Day			

# Wednesday

Note –Times listed are subject to change.

8:30 AM	John D'Ambrosia	Dell	Opening Comments	
8:40 AM	Ali Ghiasi	Ghiasi Quantum LLC	Tool for simulating 400 GbE Optical PMDs	ghiasi_3bs_01_0714.pdf
9:00 AM	Will Bliss	Broadcom	Channel Characterization for Evaluating Advanced Modulation Systems	bliss_3bs_01_0714.pdf
9:30 AM	Dan Dove	Dove Networking Soluti	Proliferation and Consolidation	dove_3bs_01_0714.pdf
10:00 AM	Break			
10:15 AM	Riu Hirai	Hitachi	Proposal Updates of Nyquist Modulation	hirai_3bs_01_0714.pdf
10:35 AM	Greg LeCheminant	Agilent	DMT Measurement Considerations	lecheminant_3bs_01_0714
10:55 AM	Yoshiaki Sone	NTT	Issues for fair comparison of PAM4 and DMT.	sone_3bs_01_0714.pdf
11:15 AM	David Lewis	JDSU	400G DMT PMD for 2km SMF	lewis_3bs_01_0714.pdf
11:35 AM	Toshiki Tanaka	Fujitsu	400G Discrete Multi-Tone PMD for 10 km SMF	tanaka_3bs_01_0714.pdf
12:05 PM	Lunch			
1:05 PM	Ian Dedic	Fujitsu	Implementation of DMT transceiver for 400GbE 2km and 10km PMD using 4 wavelengths	dedic_3bs_01_0714.pdf
1:25 PM	Fei Zhu	Huawei	Component BW requirement of 56Gbaud Modulations for 400GbE 2 & 10km PMD	zhu_3bs_01_0714.pdf
1:45 PM	Mizuki Shirao	Mitsubishi	Experimental Demonstration of 56Gb/s NRZ for 400GbE PMD	shirao_3bs_01_0714.pdf
2:05 PM	Xu Yu	Huawei	Further analyze of 8*50G PAM4 for 10km transmission	yu_3bs_01_0714.pdf
2:25 PM	Vipul Bhatt	Inphi	Four-wavelength 400G on Duplex SMF	bhatt_3bs_01_0714.pdf
2:55 PM	Break			
3:15 PM	Peter Stassar	Huawei	Updated Considerations on a 4x112Gb/s PAM4 Configuration for the 2km SMF PMD	stassar_3bs_01_0714.pdf
3:45 PM	Chris Cole	Finisar	400G & 4x100G SMF PMD Alternatives Study	cole_3bs_01_0714.pdf
4:15 PM	Chris Cole	Finisar	50G/λ vs. 100G/λ SMF PMD Alternatives Study	cole_3bs_02_0714.pdf
4:45 PM	Ayla Chang	Huawei	10km PMD-a must for carrier network	chang_3bs_01_0714.pdf
5:05 PM	Lu Huang	China Mobile	Application requirement for 400GE in 10km and above	huang_3bs_01_0714.pdf
5:45 PM	Break for day			

# Thursday

Note –Times listed are subject to change.

8:30 AM	John D'Ambrosia	Dell	Opening Comments	
9:00 AM	Discussion, Strawpolls, Motions			
10:00 AM	Break			
10:20 AM	Discussion, Strawpolls, Motions			
11:30 AM	Closing Business			
12:00 PM	Adjourn			

## Late Presentations (Pending TF Approval and Time Availability)

	Brad Booth	Microsoft	Interface Considerations	booth_3bs_01_0714.pdf
	Mizuki Shirao	Mitsubhishi	Experimental Demonstration of 56Gb/s NRZ for 400GbE PMD	shirao_3bs_01_0714.pdf
	Gary Nicholl	Cisco	400G SMF PMD Approaches - A System Vendor's perspective	nicholl_3bs_02_0714.pdf

# Future Meetings

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- See: <http://www.ieee802.org/3/interims/index.html>
- Sept 2014 Interim
  - Week of September 8
  - Brookstreet Hotel, Ottawa, Canada
- Nov 2014 Plenary
  - Week of November 2
  - Grand Hyatt San Antonio, San Antonio, TX, USA
- Jan 2015 Interim
  - Week of Jan 12
  - TBA
- Mar 2015 Plenary
  - Week of Mar 8
  - Estrel Hotel and Convention Center, Berlin, Germany
- May 2015 Interim
  - Week of May 18, 2015
  - TBA
- Anyone interested in hosting a meeting or webex contact me.

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# Thank You!