



Agenda and General Information

IEEE 802.3cd

**50 Gb/s, 100 Gb/s and 200 Gb/s Ethernet Task
Force**

Mark Nowell, Cisco

Fort Worth, Tx

Sept 14th-16th, 2016

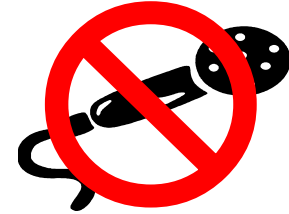
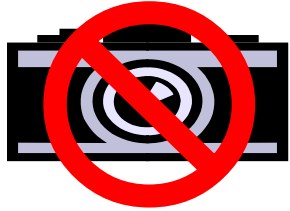
Agenda

- Welcome and Introductions
- Approve Agenda
- Approve Minutes
- Reflector and Web
- Ground Rules
- IEEE
 - Structure, Bylaws and Rules
 - Call for Patents
 - IEEE Standards Process
- Liaisons and Communications
- Baselines
- Goals for this meeting
- Meeting Schedule
- Motions and Closing Business
- Future Meetings

P802.3cd Task Force organization

- Chair: Mark Nowell, Cisco
- Recording Secretary: Kent Lusted, Intel
- Chief Editor: Matt Brown, APM
- Ad hoc chair: Kent Lusted, Intel

Task Force Decorum



- Press (i.e., anyone reporting publicly on this meeting) are to announce their presence (December 2013 IEEE-SA Standards Board Ops Manual 5.3.3.5)
- Photography or recording by permission only (December 2013 IEEE-SA Standards Board Ops Manual 5.3.3.4)
- Cell phone ringers off
- 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

Reflector and Web

- To subscribe to the Task Force's reflector, send an email to:

ListServ@ieee.org

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

*subscribe stds-802-3-50G <yourfirstname> <yourlastname>
end*

- Send Task Force reflector messages to:

stds-802-3-50G@listserv.ieee.org

- Task Force's web page URL:

<http://www.ieee802.org/3/cd/index.html>

Task Force Private Area

- None yet...soon

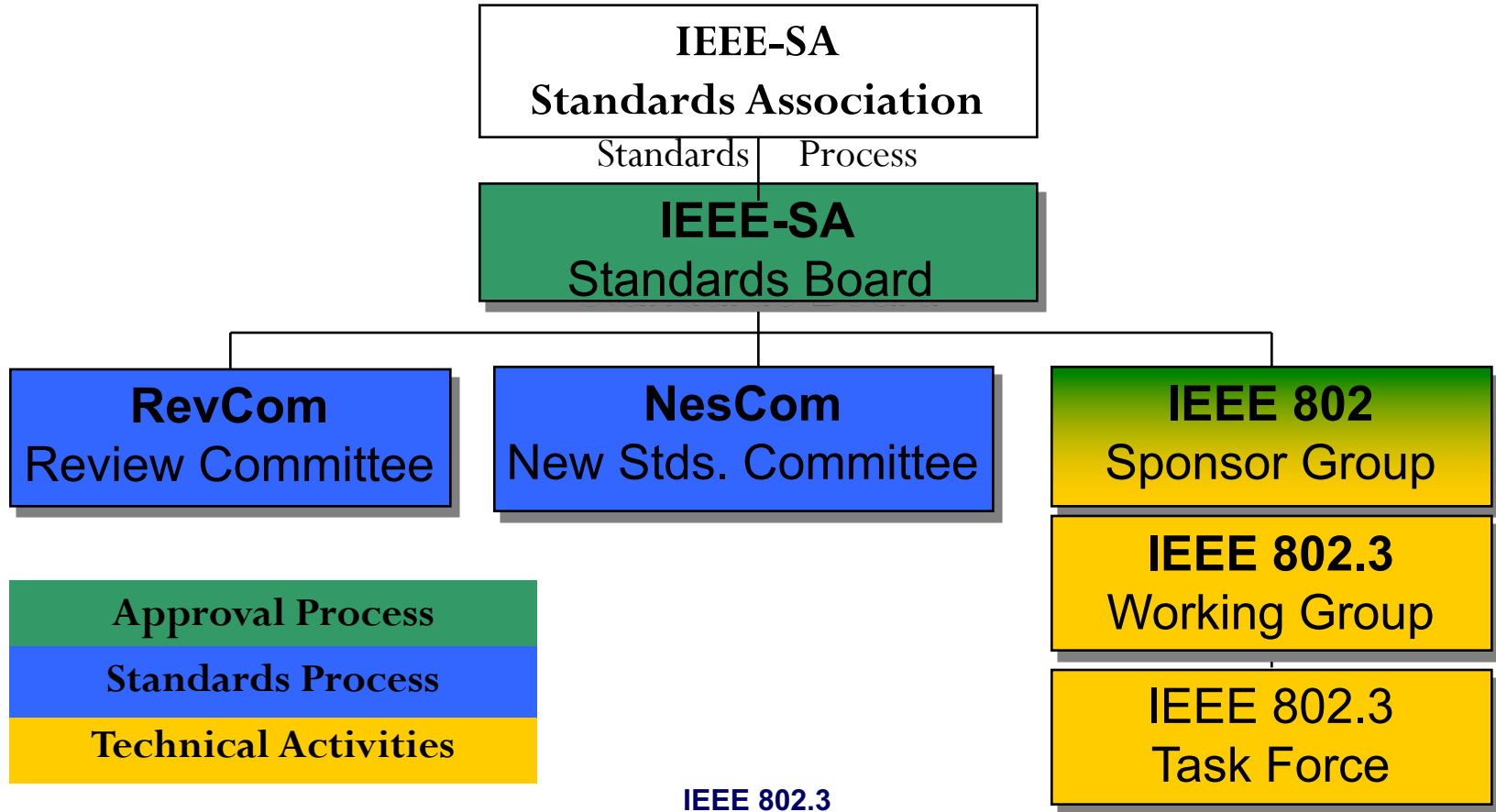
Ground Rules

- 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

Attendance

- Tutorial Material on attendance tool
 - http://ieee802.org/3/minutes/attendance_procedures.pdf
- Access details
 - URL: <http://imat.ieee.org/>
 - Use your imat login
 - (must be on meeting SSID – no VPN)

IEEE Structure



Important Bylaws and Rules

- **IEEE-SA Operations Manual**
http://standards.ieee.org/develop/policies/sa_opman/
- **IEEE-SA Standards Board Bylaws**
<http://standards.ieee.org/develop/policies/bylaws/>
- **IEEE-SA Standards Board Operations Manual**
<http://standards.ieee.org/develop/policies/opman/>
- **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/devdocs.shtml>
- **IEEE 802 LAN/MAN Standards Committee (LMSC) Working Group (WG) Policies and Procedures**
<http://www.ieee802.org/devdocs.shtml>
- **IEEE 802.3 Working Group Operating Rules**
http://ieee802.org/3/rules/P802_3_rules.pdf

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
 - “Should inform the IEEE (or cause the IEEE to be informed)” of the identity of “any other holders of 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 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

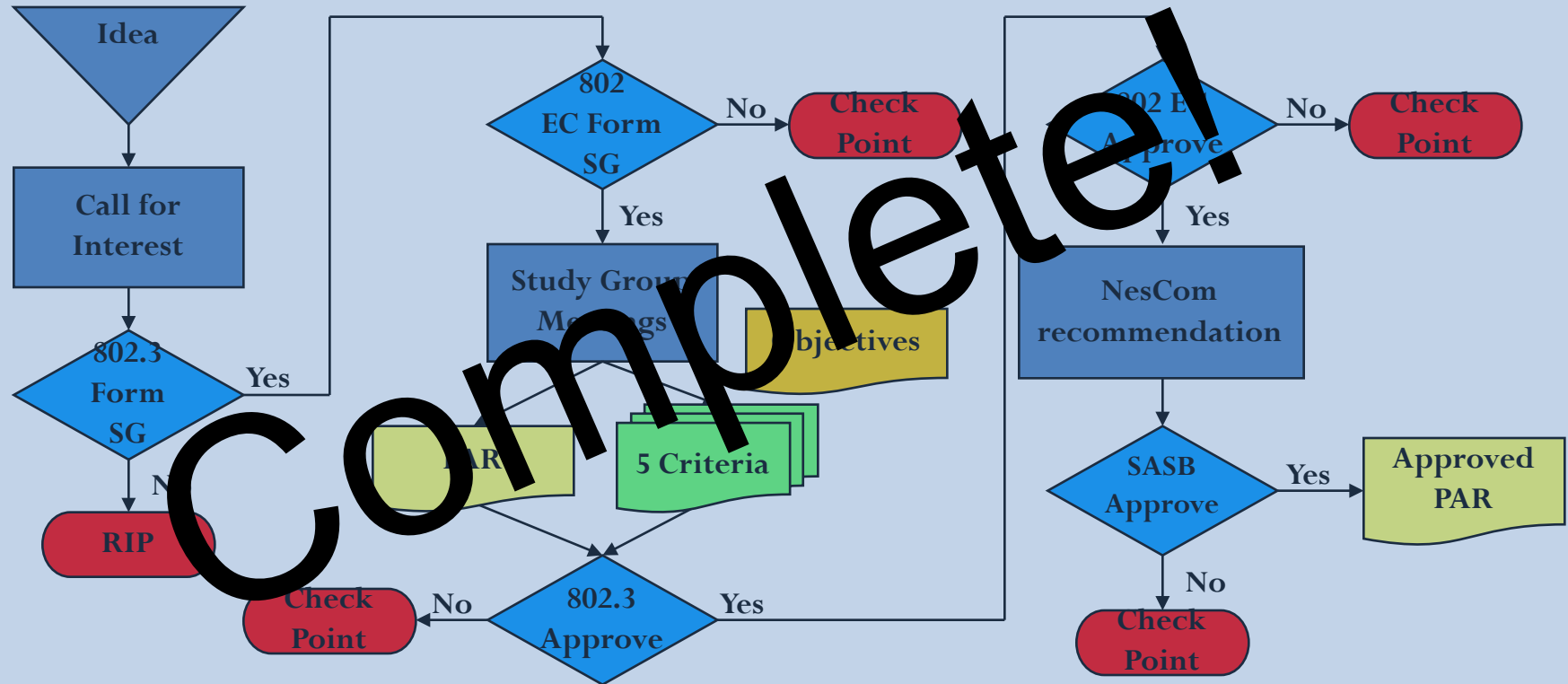
- If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance:
 - Either speak up now or
 - Provide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

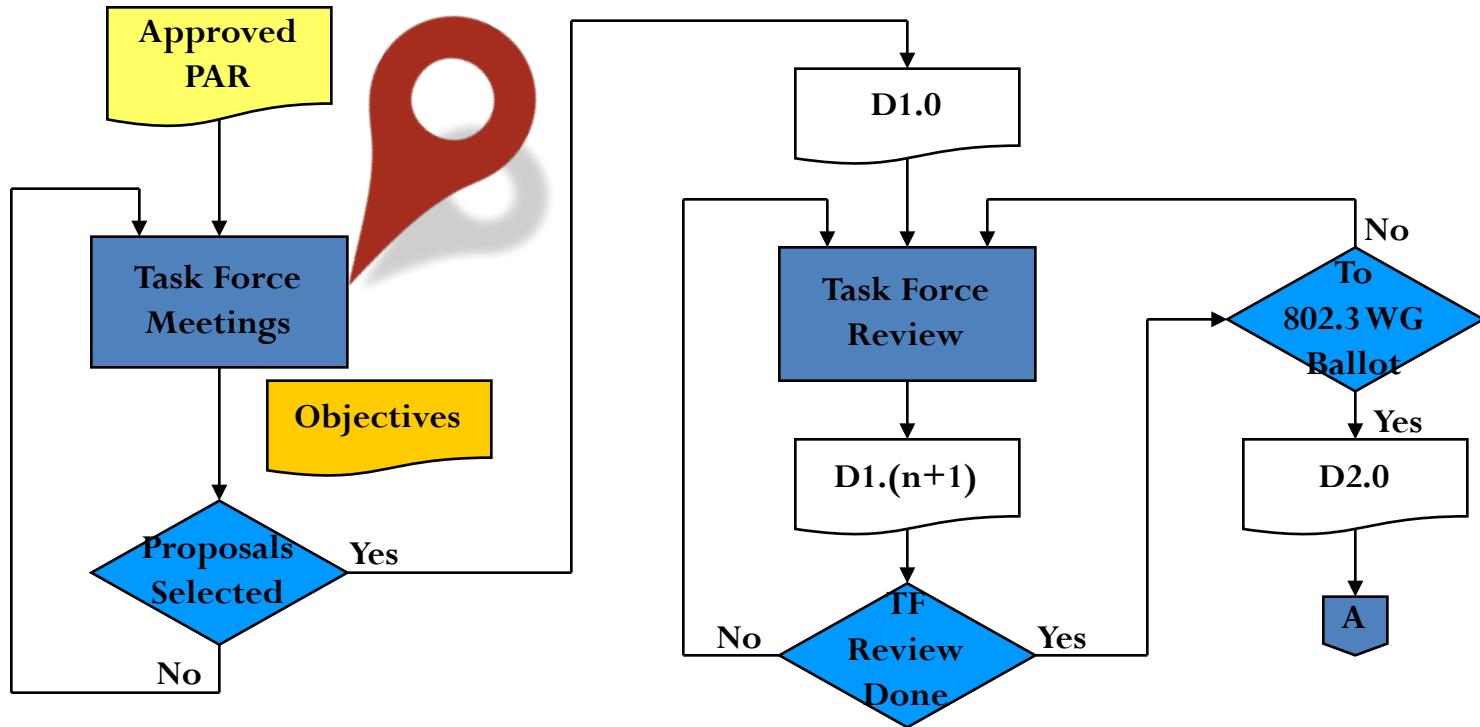
See *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and “Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy” for more details.

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

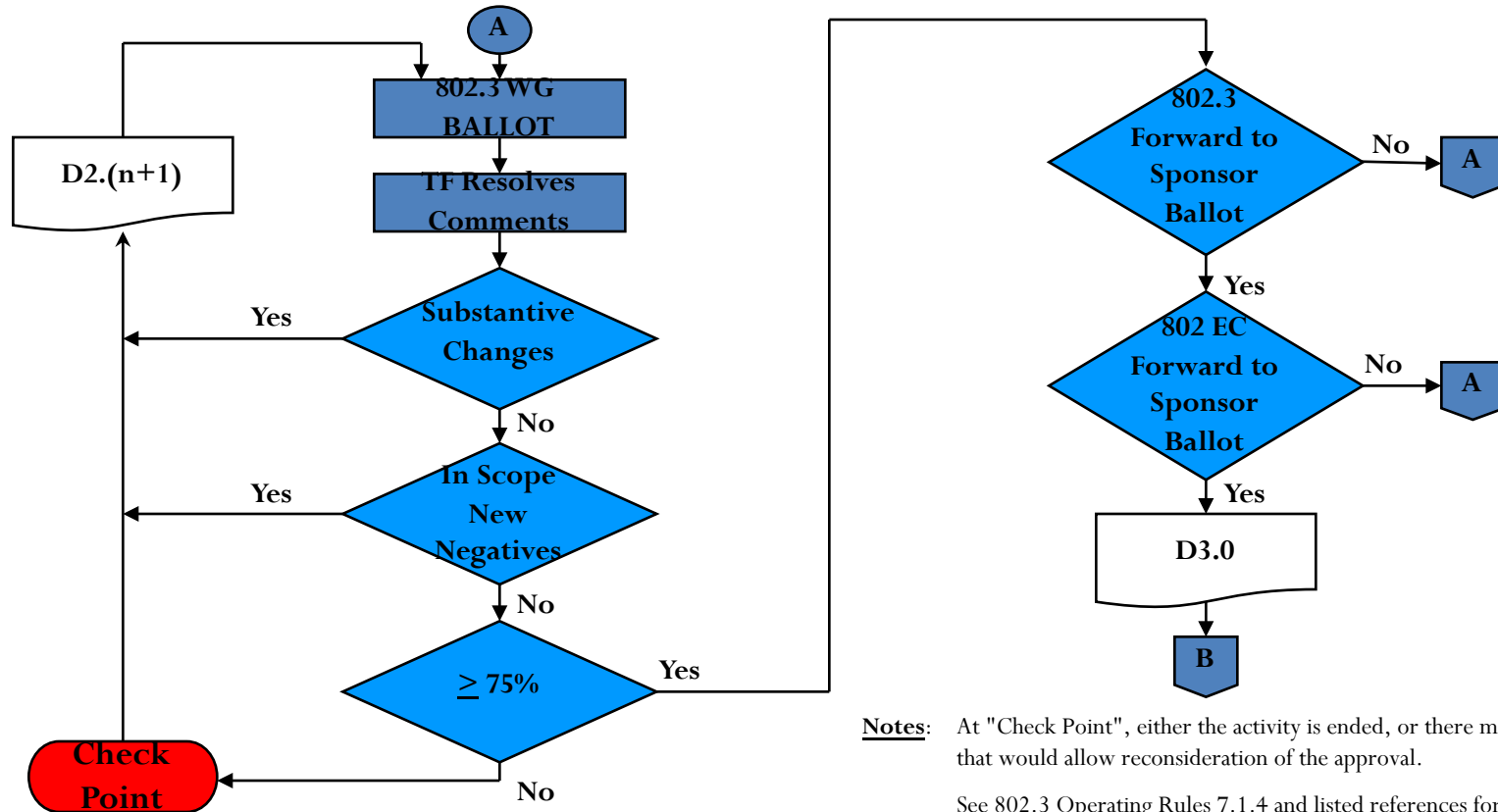


Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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



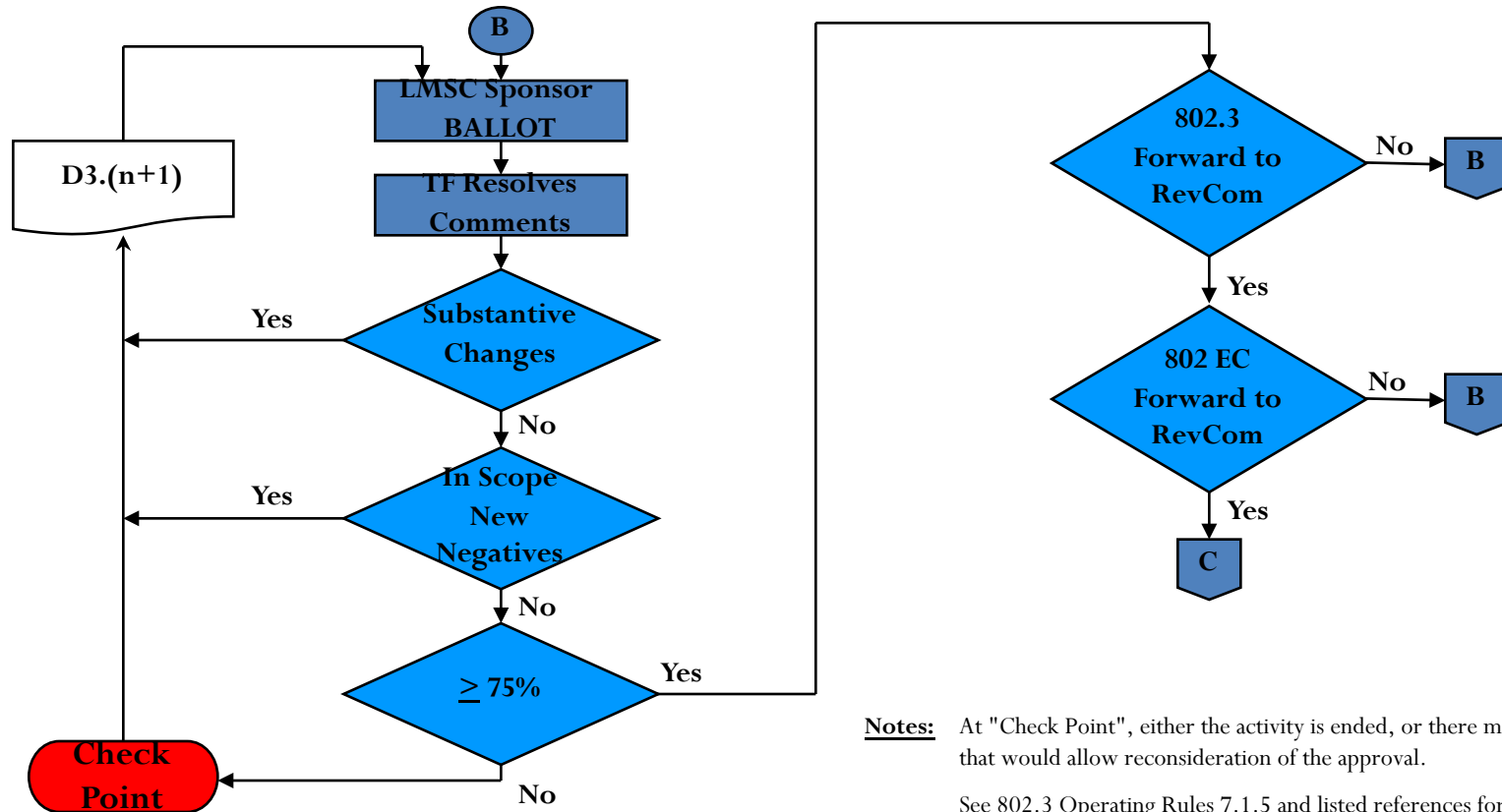
Overview of IEEE 802.3 Standards Process (3/5) – Working Group Ballot Phase



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

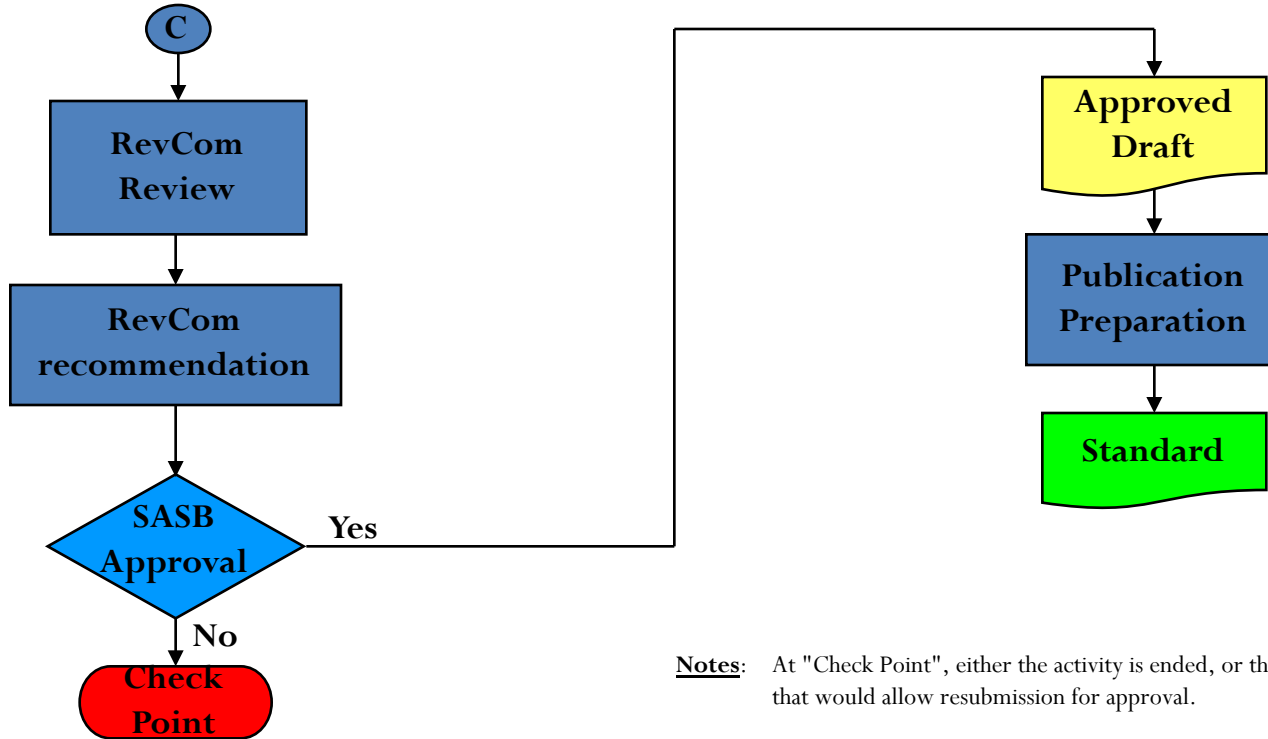
Overview of IEEE 802.3 Standards Process (4/5)- Sponsor Ballot Phase



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 resubmission for approval.

Liaisons and Communications

- none

Ad hocs

Charter: to discuss topics towards supporting the developed objectives, PAR and CSD or for providing the Task Force with contributions to help it prepare for future decisions.

Chair: Kent Lusted, Intel

<http://www.ieee802.org/3/cd/public/adhoc/index.html>

- Expected to continue the regular biweekly cadence.
- Wednesdays @ 8am PT

IEEE P802.3cd Task Force Approved Project Documents

- PAR
 - <http://www.ieee802.org/3/cd/P802.3cd.pdf>
- CSD
 - <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0060-00-ACSD-802-3cd.pdf>
- Objectives
 - http://www.ieee802.org/3/cd/P802d3cd_objectives_v3.pdf
- Timeline
 - http://www.ieee802.org/3/cd/P802d3cd_timeline.pdf

Objectives 1 of 2

- Support full-duplex operation only
- Preserve the Ethernet frame format utilizing the Ethernet MAC
- Preserve minimum and maximum FrameSize of current IEEE 802.3 standard
- Support optional Energy-Efficient Ethernet operation
- Provide appropriate support for OTN
- Support a MAC data rate of 50 Gb/s and 100 Gb/s
- Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 50 Gb/s and 100 Gb/s operation
- Support a MAC data rate of 200 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) for 200 Gb/s operation

Objectives 2 of 2

50 Gb/s Ethernet PHYs

**** adopted by Task Force. Not yet ratified by Working Group**

- Define single-lane 50 Gb/s PHYs for operation over
 - copper twin-axial cables with lengths up to at least 3m.
 - printed circuit board backplane with a total channel insertion loss of $\leq 30\text{dB}$ at 13.28125 GHz.
 - MMF with lengths up to at least 100m
 - SMF with lengths up to at least 2km
 - SMF with lengths up to at least 10km

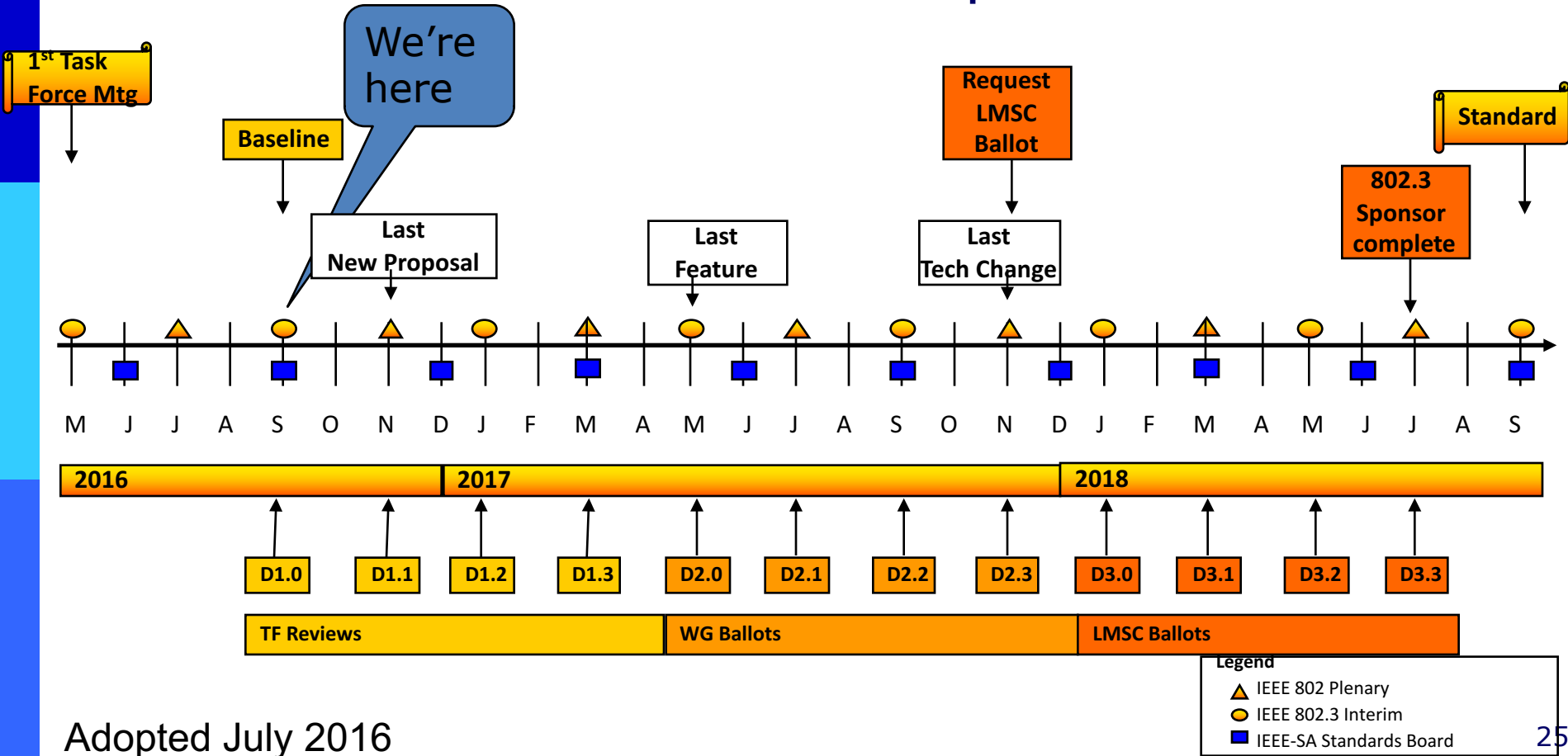
100 Gb/s Ethernet PHYs

- Define a two-lane 100 Gb/s PHY for operation over
 - copper twin-axial cables with lengths up to at least 3m.
 - printed circuit board backplane with a total channel insertion loss of $\leq 30\text{dB}$ at 13.28125 GHz.
 - MMF with lengths up to at least 100m
 - SMF with lengths up to at least 500m
- Define a 100 Gb/s PHY for operation over SMF with lengths up to at least 2 km ******

200 Gb/s Ethernet PHYs

- Define four-lane 200 Gb/s PHYs for operation over
 - copper twin-axial cables with lengths up to at least 3m.
 - printed circuit board backplane with a total channel insertion loss of $\leq 30\text{dB}$ at 13.28125 GHz.
- Define 200 Gb/s PHYs for operation over MMF with lengths up to at least 100m

IEEE P802.3cd Task Force Adopted Timeline



Where are we now?

- Many baselines proposed, reviewed adopted so far:
 - 50 Gb/s and 100 Gb/s RS/MII, PCS, FEC and PMA;
 - EEE;
 - Auto-Negotiation;
 - AUIs: 50GAUI; CAUI-2 C2C & C2M;
 - PMDs: 50GBASE-LR; 50GBASE-FR; 50GBASE-SR; 200GBASE-SR4; Copper twin-axial cable, MDI, TX/RX PCB IL, and test fixture;
- Still to go – this week's focus
 - PMDs: Electrical cable/backplane COM baseline;
 - 100G 100m MMF;
 - 100G SMF;

P802.3cd Project Documentation

We likely have a disconnection between:

- A currently proposed baseline for 100G SMF objective
- Currently adopted CSD

Outlined in: [nowell 083116 3cd adhoc.pdf](#)

The Task Force will, this week, review a set of presentations that propose a potential resolution to this issue.

If Task force accepts resolution, Working Group approval is possible on Thursday evening's 802.3 WG meeting

Goals for the meeting

- Review technical contributions
- Build, assess consensus on proposals
- Consider making some decisions:
 - Baselines
 - New Objectives
 - New CSD document
- Establish work items for Nov Meeting
- Editorial team planning to generate D1.0 with approved baselines
- Request approval @ 802.3WG for any TF progress as appropriate

Meeting Schedule - Wednesday

Wednesday

14-Sep-16

Time	Presenter	Affiliation	Title	File Name	Duration
1:00 PM	Mark Nowell	Cisco	Agenda and General Information	agenda_3cd_01_0916.pdf	0:40
1:40 PM	Kent Lusted	Intel	802.3cd Task Force Ad-hoc report	lusted_3cd_01_0916.pdf	0:10
1:50 PM	Matt Brown	APM	802.3cd Editorial Consideration	brown_3cd_01_0916.pdf	0:10
2:00 PM	Tom Issenhuth	Microsoft	DR1 Use Cases & End User Perspective	issenhuth_3cd_01_0916.pdf	0:20
2:20 PM	Justin Abbott	Lumentum	Economic Feasibility for Single Lambda PAM4	abbott_3cd_01_0916.pdf	0:20
2:40 PM	Francesco Caggioni	APM	Real 100G single Lambda optical link experiment and data	caggioni_3cd_01_0916.pdf	0:20
3:00 PM	Break				0:15
3:15 PM	Mark Kimber	Semtech	Component vendor perspective on PMDs for 100G/l	kimber_3cd_01_0916.pdf	0:20
3:35 PM	Hai-Feng Liu	Intel	Technical Feasibility Study of 106 Gb/s PAM4 Optical Link	liu_3cd_01_0916.pdf	0:25
4:00 PM	Matt Traverso	Cisco	Technical Feasibility Update on single wavelength 100Gbps PAM4 modulation	traverso_3cd_02_0916.pdf	0:20
4:20 PM	Gary Nicholl	Cisco	Path forward for 100G SMF objectives in 802.3cd	nicholl_3cd_01_0916.pdf	0:30
4:50 PM	Matt Brown	APM	Proposed Updated Responses: Criteria for Standards Development (CSD)	brown_3cd_02_0916.pdf	0:30
5:20 PM	SMF Discussion/Straw Polls				0:30
5:50 PM	Break				

Note –Times listed are subject to change.

Updated versions will be captured with new filename versions

Meeting Schedule – Thursday

Thursday

15-Sep-16

Time	Presenter	Affiliation	Title	File Name	Duration
9:00 AM	Mark Nowell	Cisco	Opening	agenda_3cd_01_0916.pdf	0:10
9:10 AM	Matt Traverso	Cisco	Towards a baseline proposal for a 100 Gb/s SMF PHY 500 m using single wavelength PAM4 modulation 100GBASE-DR	traverso_3cd_01_0916.pdf	0:20
9:30 AM	Rick Pimpinella	Panduit	Multimode fiber media types for 802.3cd	pimpinella_3cd_01_0916.pdf	0:20
9:50 AM	Jonathan King	Finisar	100GBASE-SR2 baseline proposal update	king_3cd_01_0916.pdf	0:25
10:15 AM	Jonathan Ingham	Foxconn Interconnect Technology	Updated baseline proposal for the 100 Gb/s MMF objective using two-wavelength PAM4 transmission	ingham_3cd_01_0916.pdf	0:25
10:40 AM	Break				0:15
10:55 AM	Optics Discussions/Straw Polls/Motions				1:05
12:00 PM	Lunch				1:00
1:00 PM	Upen Reddy Kareti	Cisco	Baseline COM parameters for 50G Backplane and DAC	kareti_3cd_01_0916.pdf	0:20
1:20 PM	Mike Peng Li	Intel	Baseline proposal for 50G Backplane and DAC	li_3cd_01_0916.pdf	0:25
1:45 PM	Ali Ghiasi	Ghiasi Quantum	PCS Clause Need to Document Separated and Integrated PCS	ghiasi_3cd_01_0916.pdf	0:20
2:05 PM	Gary Nicholl	Cisco	Baseline proposal for "Alignment Marker mapping to FEC lanes" for 50GbE and NG 100GbE	nicholl_3cd_02_0916.pdf	0:20
2:25 PM	Discussions/Straw Polls/Motions as needed				0:35
3:00 PM	Break				0:20
3:20 PM	Discussions/Straw Polls/Motions as needed				2:00
5:20 PM	Break				

Note –Times listed are subject to change.

Updated versions will be captured with new filename versions

Meeting Schedule – Friday

Friday

16-Sep-16

<u>Time</u>	<u>Presenter</u>	<u>Affiliation</u>	<u>Title</u>	<u>File Name</u>	<u>Duration</u>
8:30 AM	Mark Nowell	Cisco	Opening	agenda_3cd_01_0916.pdf	0:10
8:40 AM	Discussions/Straw Polls/Motions as needed				1:50
10:30 AM	Break				0:15
10:45 AM	Discussions/Straw Polls/Motions as needed				1:00
11:45 AM	Adjourn				

Note –Times listed are subject to change.

Updated versions will be captured with new filename versions

Future Meetings & Ad hocs

- Ad-hoc meeting plans
 - Single on-going biweekly meetings, all topics (will cycle) – agendas will be published. 2hr duration.
 - Wed 8-10 Pacific
- See: <http://www.ieee802.org/meeting/index.html>
- November 2016 Plenary
 - Week of Nov 7th, 2016 – San Antonio, TX
- January 2017 Interim
 - Week of Jan 9th, 2017 – Huntington Beach, CA
- March 2017 Plenary
 - Week of March 12th, 2017 – Vancouver, BC
- Anyone interested in hosting a interim meeting contact me or the IEEE 802.3 Executive Secretary Steve Carlson.



Thank You!