
AGENDA AND GENERAL INFORMATION

IEEE P802.3CK - 100 GB/S, 200 GB/S, AND 400 GB/S

ELECTRICAL INTERFACES TASK FORCE

BETH KOCHUPARAMBIL, EMPLOYED BY AND AFFILIATED WITH CISCO SYSTEMS

KENT LUSTED, EMPLOYED BY AND AFFILIATED WITH INTEL CORPORATION

PITTSBURGH, PA, USA – MAY 21-25, 2018

INTRODUCTIONS

Beth Kochuparambil – Cisco Systems, Inc.

Task Force Chair

Kent Lusted – Intel

Task Force Vice Chair & Recording Secretary

AGENDA

- Welcome and Introductions
- Approve Agenda
- Approve Minutes from March Plenary
- Ground Rules
- IEEE Structure and Policies
- Reflector and Web
- Goals for the meeting
- Big Ticket Items
- Future Meetings
- Presentations
- Straw Polls

TASK FORCE DECORUM



- An officer is permitted to make an audio or slideshow recording of this meeting exclusively for the purpose of generating minutes which shall not be copied or distributed. **IEEE 802.3 meetings do not use this option.** Recording of the proceedings by any other participant or observer, in part or in whole, via any means, is prohibited. (December 2017 IEEE-SA Standards Board Ops Manual 5.3.3.2)
- Press (i.e., anyone reporting publicly on this meeting) are to announce their presence (December 2017 IEEE-SA Standards Board Ops Manual 5.3.3.3)
- 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

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
Task Force

Approval Process

Standards Process

Technical Activities

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 HAVE A DUTY TO INFORM THE IEEE

- Participants 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
- Participants should inform the IEEE (or cause the IEEE to be informed) of the identity of any other holders of potential Essential Patent Claims

**Early identification of holders of potential
Essential Patent Claims is encouraged**

WAYS TO INFORM IEEE

- **Cause an LOA to be submitted to the IEEE-SA (patcom@ieee.org); 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**
- **Speak up now and respond to this 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, please respond at this time by providing relevant information to the WG Chair

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 of different technical approaches that include relative costs of patent licensing terms may be discussed in standards development meetings.
 - **Technical considerations remain the 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.**

For more details, see *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and
Antitrust and Competition Policy: What You Need to Know at <http://standards.ieee.org/develop/policies/antitrust.pdf>

PATENT-RELATED INFORMATION

The patent policy and the procedures used to execute that policy are documented in the:

- ***IEEE-SA Standards Board 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**

Participation in IEEE 802 Meetings

Participation in any IEEE 802 meeting (Sponsor, Sponsor subgroup, Working Group, Working Group subgroup, etc.) is on an individual basis

- Participants in the IEEE standards development individual process shall act based on their qualifications and experience. (https://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf section 5.2.1)
- IEEE 802 Working Group membership is by individual; “Working Group members shall participate in the consensus process in a manner consistent with their professional expert opinion as individuals, and not as organizational representatives”. (subclause 4.2.1 “Establishment”, of the IEEE 802 LMSC Working Group Policies and Procedures)
- Participants have an obligation to act and vote as an individual and not under the direction of any other individual or group. A Participant’s obligation to act and vote as an individual applies in all cases, regardless of any external commitments, agreements, contracts, or orders.
- Participants shall not direct the actions or votes of any other member of an IEEE 802 Working Group or retaliate against any other member for their actions or votes within IEEE 802 Working Group meetings, see https://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf section 5.2.1.3 and the IEEE 802 LMSC Working Group Policies and Procedures, subclause 3.4.1 “Chair”, list item x.

By participating in IEEE 802 meetings, you accept these requirements. If you do not agree to these policies then you shall not participate.

(Latest revision of IEEE 802 LMSC Working Group Policies and Procedures: <http://www.ieee802.org/devdocs.shtml>)

REFLECTOR AND WEB

- To subscribe to the 100GEL reflector, send an email to:

ListServ@ieee.org

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

subscribe STDS-802-3-100GEL <yourfirstname> <yourlastname>

end

- Send 100GEL reflector messages to:

STDS-802-3-100GEL@LISTSERV.IEEE.ORG

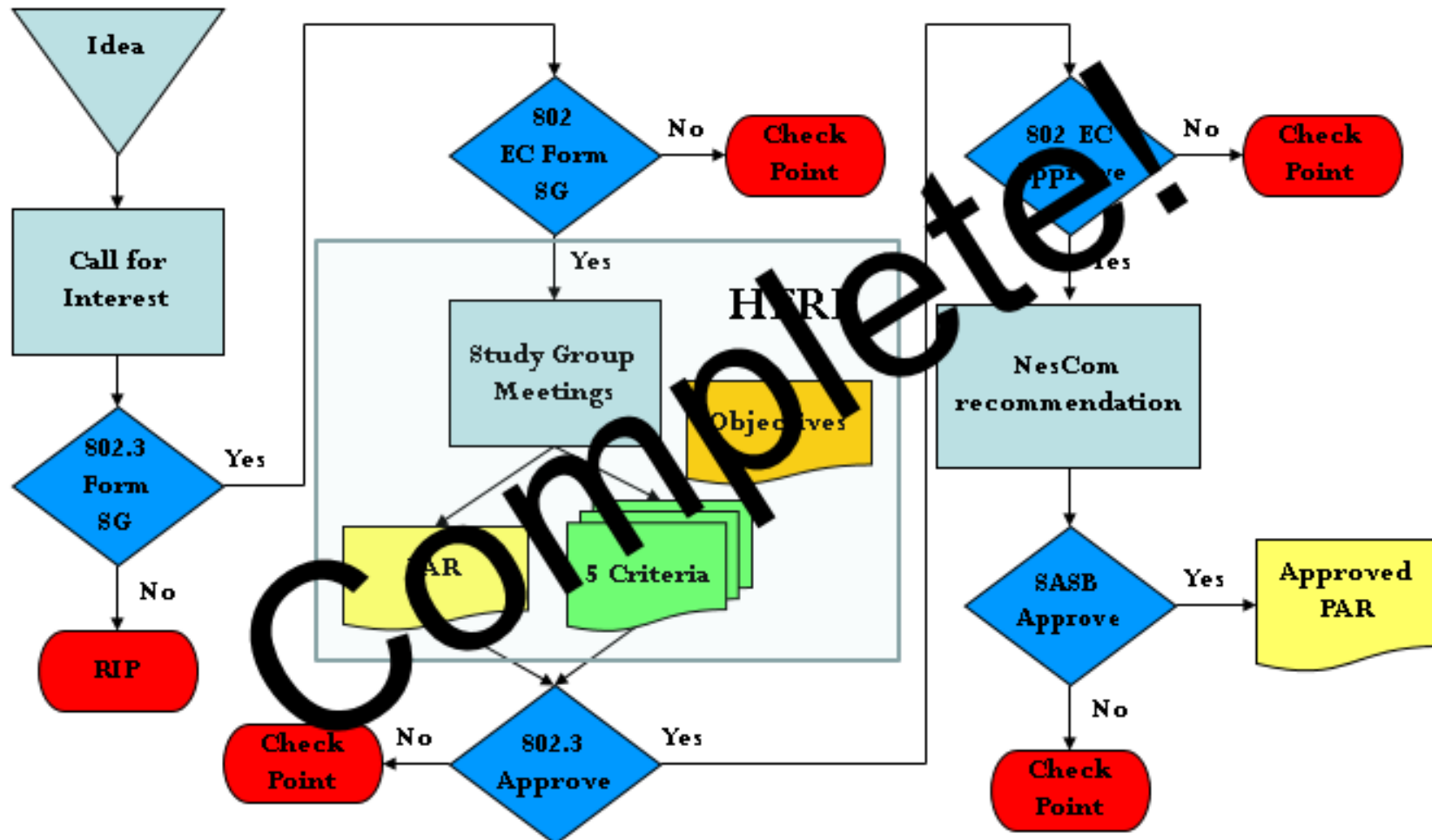
- Task Force  web page URL:

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

ATTENDANCE

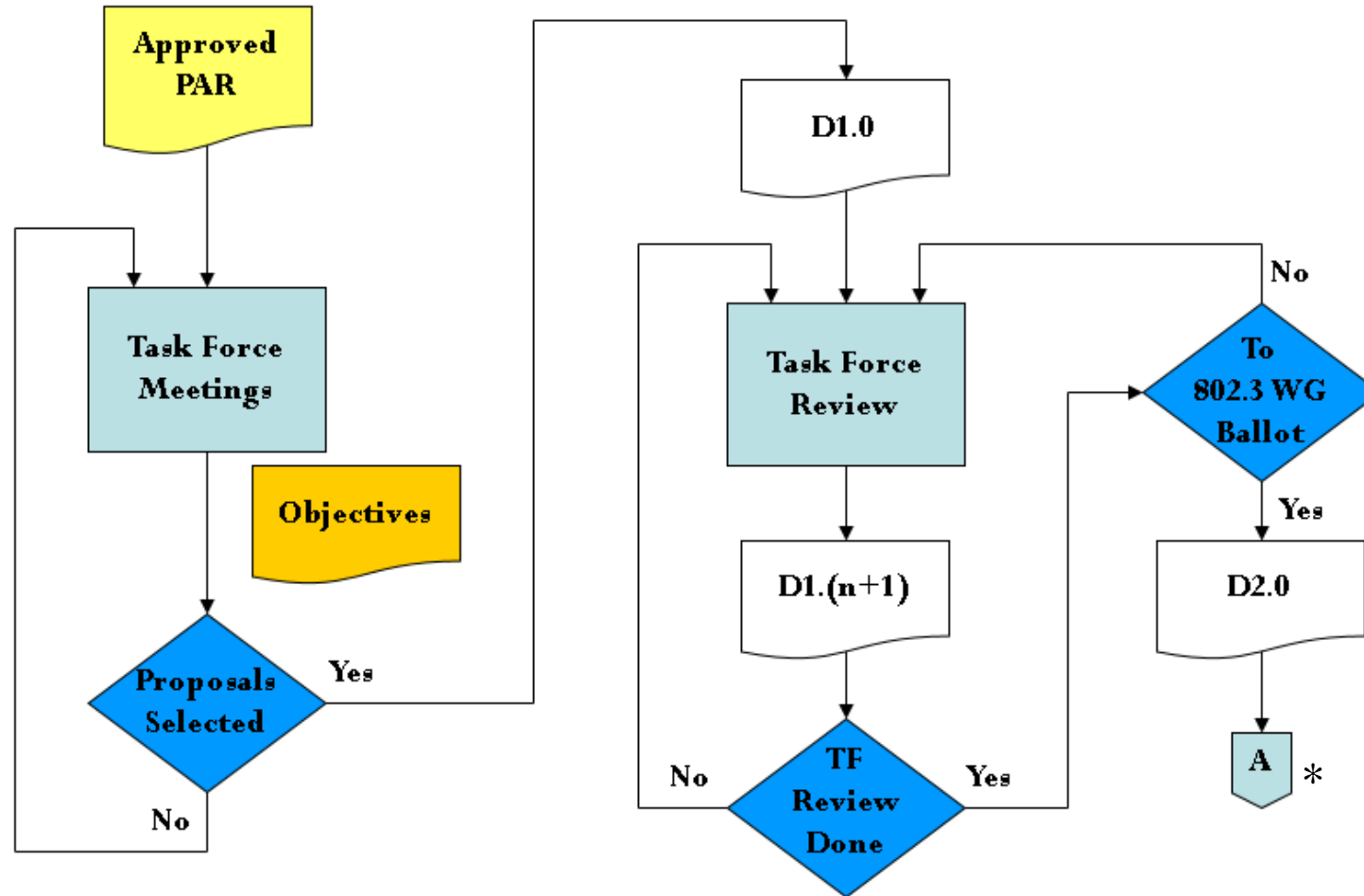
- Tutorial Material on attendance tool
 - http://ieee802.org/3/minutes/attendance_procedures.pdf
- Access details
 - URL: <http://imat.ieee.org/>
 - (For interim) Password will be provided
- Please ALSO initial in the attendance book.

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

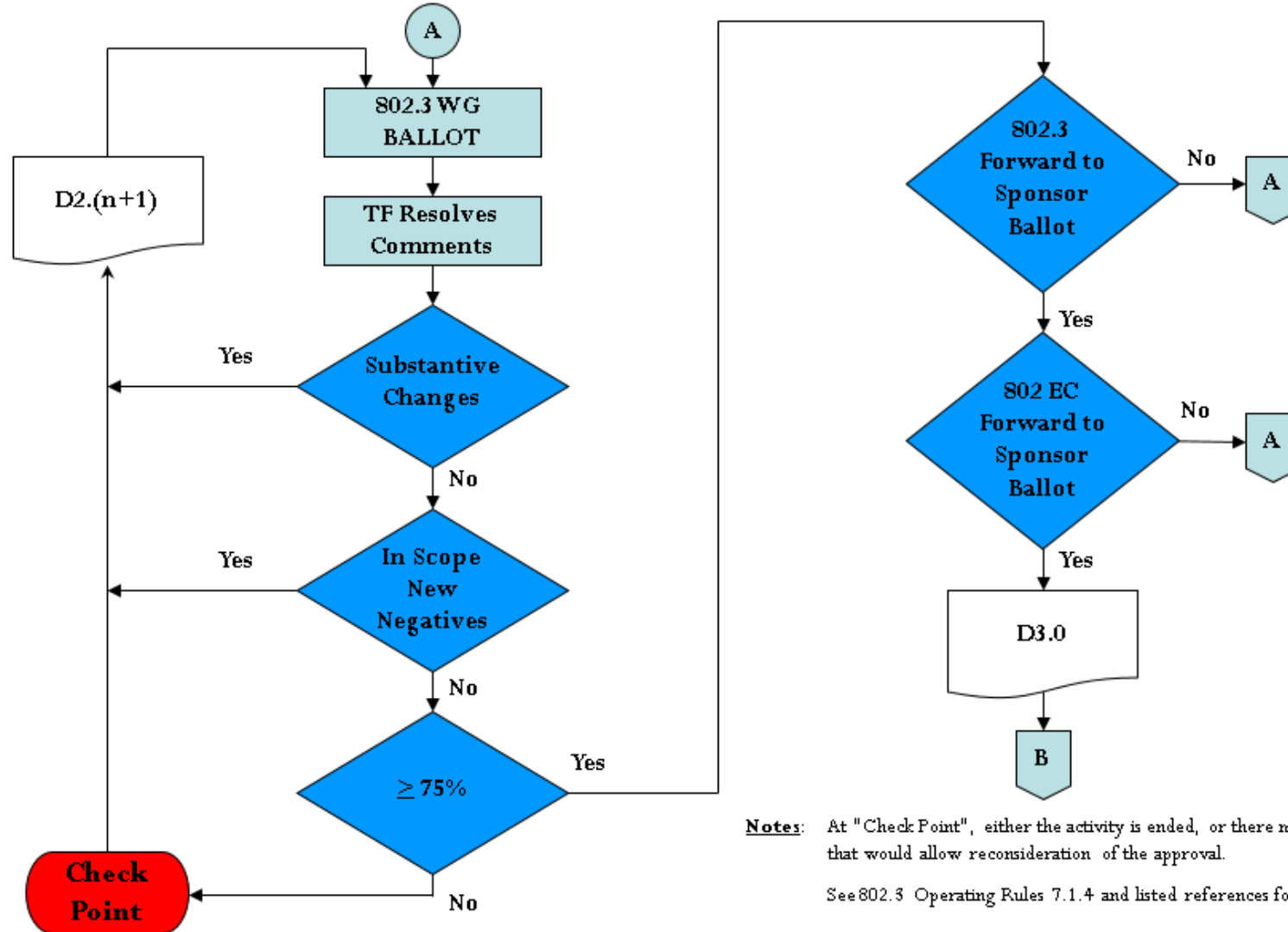


Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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



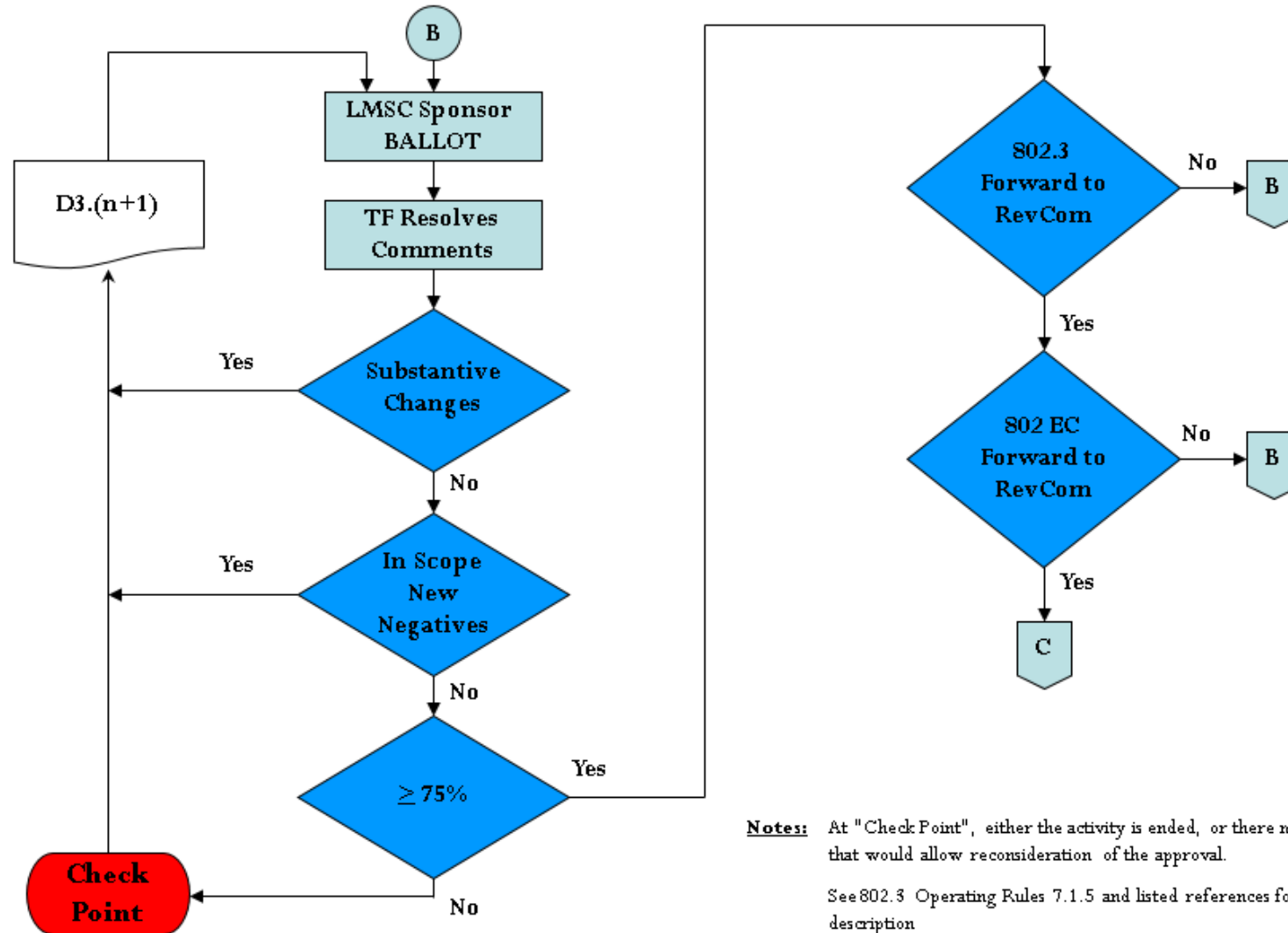
Overview of IEEE 802.3 Standards Process (3/5) – Working Group Ballot Phase



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

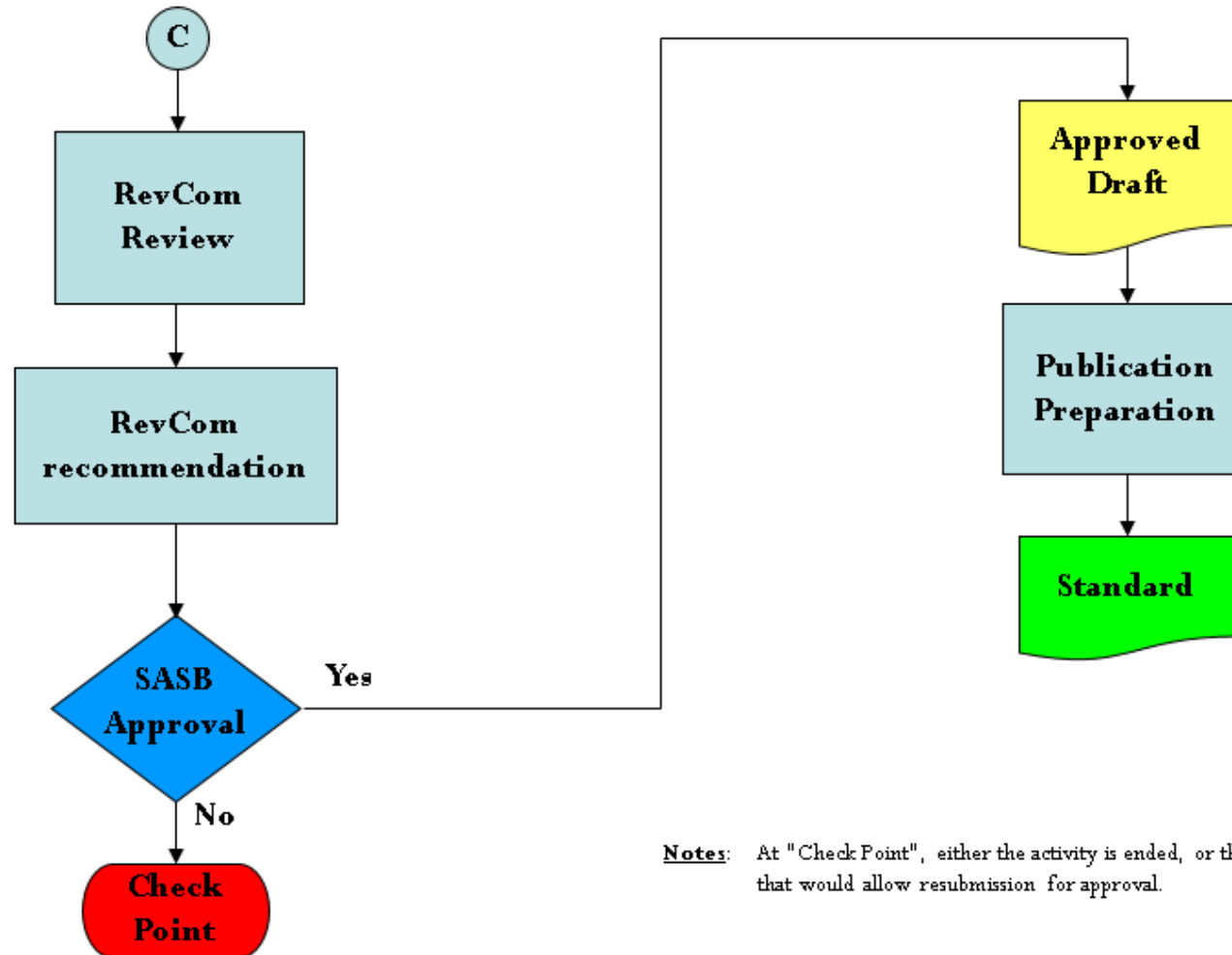
Overview of IEEE 802.3 Standards Process (4/5)- Sponsor Ballot Phase



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.

ACTIVITIES SINCE MARCH PLENARY

- **Objectives approved by WG –3/8/2018**
- **CSD/PAR accepted by EC – 3/9/2018**
 - <https://mentor.ieee.org/802-ec/dcn/18/ec-18-0077-00-ACSD-802-3ck.pdf>
- Sponsor Acceptance of PAR submittal – 3/11/2018
- PAR recommended by NevCom – 5/1/2018
- **PAR accepted by SASB – 5/14/2018**
- **Held 1 Ad Hoc call (3 presentations) in preparation for May interim**
 - <http://www.ieee802.org/3/100GEL/public/adhoc/index.html>

ADOPTED OBJECTIVES (1 OF 2)

- Support a MAC data rate of 100 Gb/s, 200 Gb/s and 400 Gb/s
- 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 the existing bit error ratios (BERs) at the MAC/PLS service interface (or the frame loss ratio equivalent) for 100 Gb/s, 200 Gb/s and 400 Gb/s Ethernet

- Define a single-lane 100 Gb/s Attachment Unit interface (AUI) for chip-to-module applications, compatible with PMDs based on 100 Gb/s per lane optical signaling
- Define a single-lane 100 Gb/s Attachment Unit Interface (AUI) for chip-to-chip applications
- Define a single-lane 100 Gb/s PHY for operation over electrical backplanes supporting an insertion loss ≤ 28 dB at 26.56 GHz.
- Define a single-lane 100 Gb/s PHY for operation over twin-axial copper cables with lengths up to at least ²¹ 2 m.

ADOPTED OBJECTIVES (2 OF 2)

- Define a two-lane 200 Gb/s Attachment Unit interface (AUI) for chip-to-module applications, compatible with PMDs based on 100 Gb/s per lane optical signaling.
- Define a two-lane 200 Gb/s Attachment Unit Interface (AUI) for chip-to-chip applications.
- Define a two-lane 200 Gb/s PHY for operation over electrical backplanes supporting an insertion loss ≤ 28 dB at 26.56 GHz.
- Define a two-lane 200 Gb/s PHY for operation over twin-axial copper cables with lengths up to at least 2 m.

- Define a four-lane 400 Gb/s Attachment Unit interface (AUI) for chip-to-module applications, compatible with PMDs based on 100 Gb/s per lane optical signaling.
- Define a four-lane 400 Gb/s Attachment Unit Interface (AUI) for chip-to-chip applications.
- Define a four-lane 400 Gb/s PHY for operation over electrical backplanes supporting an insertion loss ≤ 28 dB at 26.56 GHz.
- Define a four-lane 400 Gb/s PHY for operation over twin-axial copper cables with lengths up to at least 2 m.

GOALS FOR THIS MEETING

- Enable technical discussion that were held back during study group phase
- Understand a direction for study needed to get to baseline

LIAISONS AND COMMUNICATIONS

- <NONE>

Time	Presenter	Affiliation	Title	File Name	Duration
8:30 AM	Beth Kochuparambil	Cisco	Agenda	agenda_3ck_01_0518	0:45
8:45 AM	Kent Lusted	Intel	Next Steps towards Baselines and the Draft Specification	lusted_3ck_01_0518	0:15
9:00 AM	Adee Ran	Intel	Channel Specification for 802.3ck - Challenges and Possible Paths	ran_3ck_01_0518	0:40
9:40 AM	Rob Stone	Broadcom	Short Host Channel System Implications	stone_03ck_01_0518	0:25
10:05 AM	Ali Ghiasi	Ghiasi Quantum	C2M AUI and Cu MDI Options	ghiasi_3ck_01_0518	0:25
10:30 AM	BREAK				0:15
10:45 AM	Jane Lim	Cisco	100GEL C2M Channel Reach Options & System Design Impacts	lim_3ck_01_0518	0:25
11:10 AM	David Malicoat	Malicoat Net./Aquantia	Copper Cabling Requirements for 100Gb/s Lane	malicoat_3ck_01_0518	0:25
11:35 AM	Discussion				
12:00 PM	BREAK				1:00
1:00 PM	Phil Sun	Credo	100G PAM4 Test Results in Support of Balanced Equalization Architectures	sun_3ck_01_0518	0:25
1:25 PM	Toshiaki Sakai	Socionext	Consideration on 100Gb/s C2M SerDes Equalizer	sakai_3ck_01_0518	0:25
1:50 PM	Adee Ran	Intel	A Possible Receiver Architecture and Preliminary COM Analysis with 802.3 100G	ran_3ck_02_0518	0:30
2:20 PM	Rich Mellitz	Samtec	QSFP C2M (TP0 to TP2) channels: 12mm to 42mm intra-cabled host with best a	mellitz_3ck_01_0518	0:30
2:50 PM	Discussion				
3:00 PM	BREAK				0:15
3:15 PM	Liav Ben Artsi	Marvell	A Correlation Study Between COM Reference PKG and Physical Models	benartsi_3ck_01_0518	0:20
3:35 PM	Brian Holden	Kandou	Using Chiplets to Lower Package Loss	holden_03ck_01_0518	0:20
3:55 PM	Mark Gustlin	Xilinx	PCS, FEC, and PMA Sublayer Baseline Proposal	gustlin_3ck_01_0518	0:20
	Discussions & Straw Polls				
5:00 PM	Hard Stop at 5:00pm -- BREAK FOR THE DAY -- Working Group Meeting starts @ 6:30 PM				

▲ THURSDAY ▲

- MEETING SCHEDULE -

▼ FRIDAY ▼

Time	Presenter	Affiliation	Title	File Name	Duration
9:00 AM	Beth Kochuparambil	Cisco	Opening		0:10
	Remaining presentations, Discussions & Straw Polls, Closing Business				
12:00 PM	CLOSE OF MEETING				

CORRECTION FROM PREVIOUSLY POSTED AGENDA... We have a hard stop at 5pm on Thursday. The goal for this meeting is to enable discussions, if conversation is productive, timeline may slip into Friday morning.

FUTURE MEETINGS

- July Plenary – San Diego, CA
 - Week of July 9th
 - Early Registration is THIS FRIDAY (May 25th)
 - <http://802world.org/plenary/registration-information/>
- September Interim – Spokane, WA
 - Week of September 10th
- November Plenary – Bangkok, Thailand
 - Week of November 12th
- See <http://www.ieee802.org/3/interims/index.html> for more information
- Anyone interested in hosting a interim meeting contact me or the IEEE 802.3 Executive Secretary [Steve Carlson](#).

FUTURE MEETINGS

- Likely to be a single 2hour Ad Hoc between now and July.
- Watch reflector for announcement
- Possibly the week of June 18th.

May						
Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
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27	28	29	30	31		

June						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

July						
Su	Mo	Tu	We	Th	Fr	Sa
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29	30	31				

August						
Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
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26	27	28	29	30	31	

September						
Su	Mo	Tu	We	Th	Fr	Sa
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23	24	25	26	27	28	29
30						

October						
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	1	2	3	4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November						
Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December						
Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					



THANK YOU!

