Agenda and General Information

IEEE 802.3

50 Gb/s Ethernet over a single lane

Next Generation 100 Gb/s and 200 Gb/s Ethernet

Joint Study Group Meeting

Mark Nowell, Cisco

Atlanta, Ga, USA

Jan 18th-19th, 2016

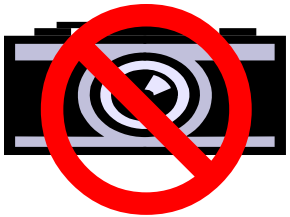
Agenda

- Welcome and Introductions
- Approve Agenda
- Reflector and Web
- Ground Rules
- IEEE
  - Structure, Bylaws and Rules
  - IEEE Guidelines for Meetings
  - IEEE Standards Process
- Liaisons and Communications
- Crash course on Study Groups
- Goals for this meeting
- Big Ticket Items
- Meeting Schedule
- Motions and Closing Business
- Future Meetings

Study Groups' organization

- Chair: Mark Nowell, Cisco
- Recording Secretary: Kent Lusted, Intel
- 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 Study Groups' 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 Study Group reflector messages to:

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

- Study Group's web page URLs:

  http://www.ieee802.org/3/50G/index.html

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

Ground Rules

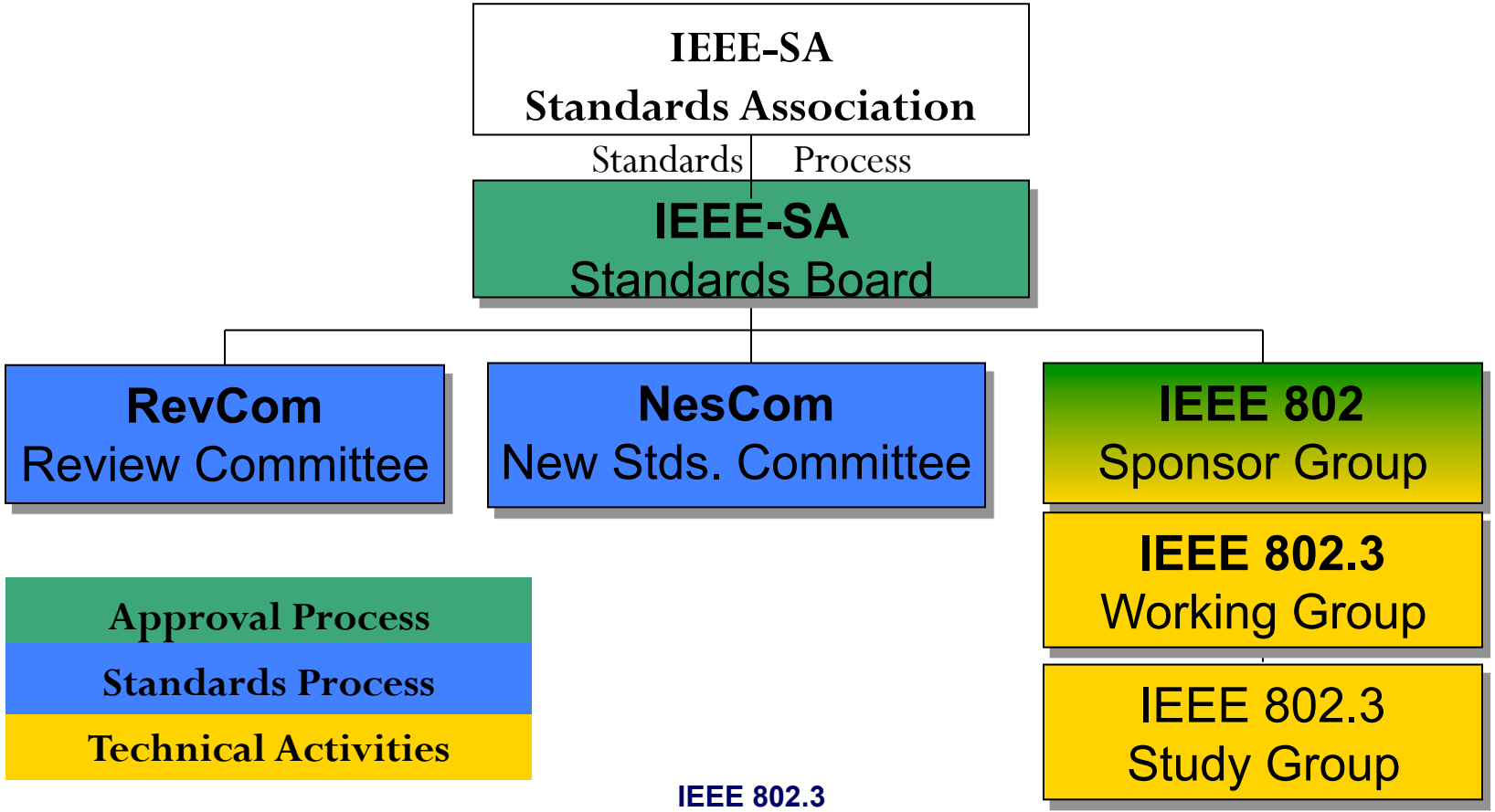
- Based upon IEEE 802.3 Rules
  - Foundation based upon Robert's Rules of Order
  - Anyone in the room may speak
  - Anyone in the room may vote
- **RESPECT**… give it, get it
- NO product pitches
- NO corporate pitches
- NO prices!!!
  - This includes costs, ASPs, etc. no matter what the currency
-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

Guidelines for IEEE-SA 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.**

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

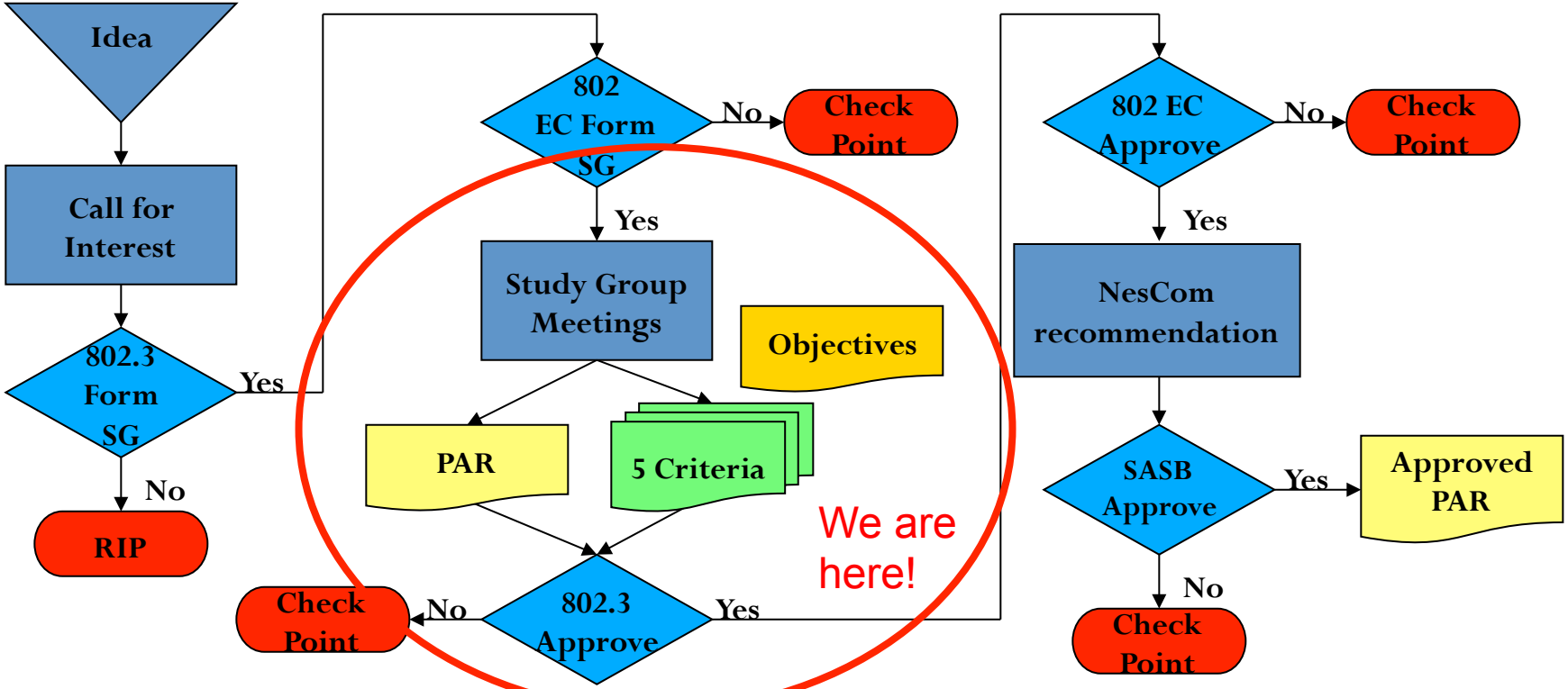
See IEEE-SA Standards Board Operations Manual, clause 5.3.10 and "Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy" for more details.

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

March 2015

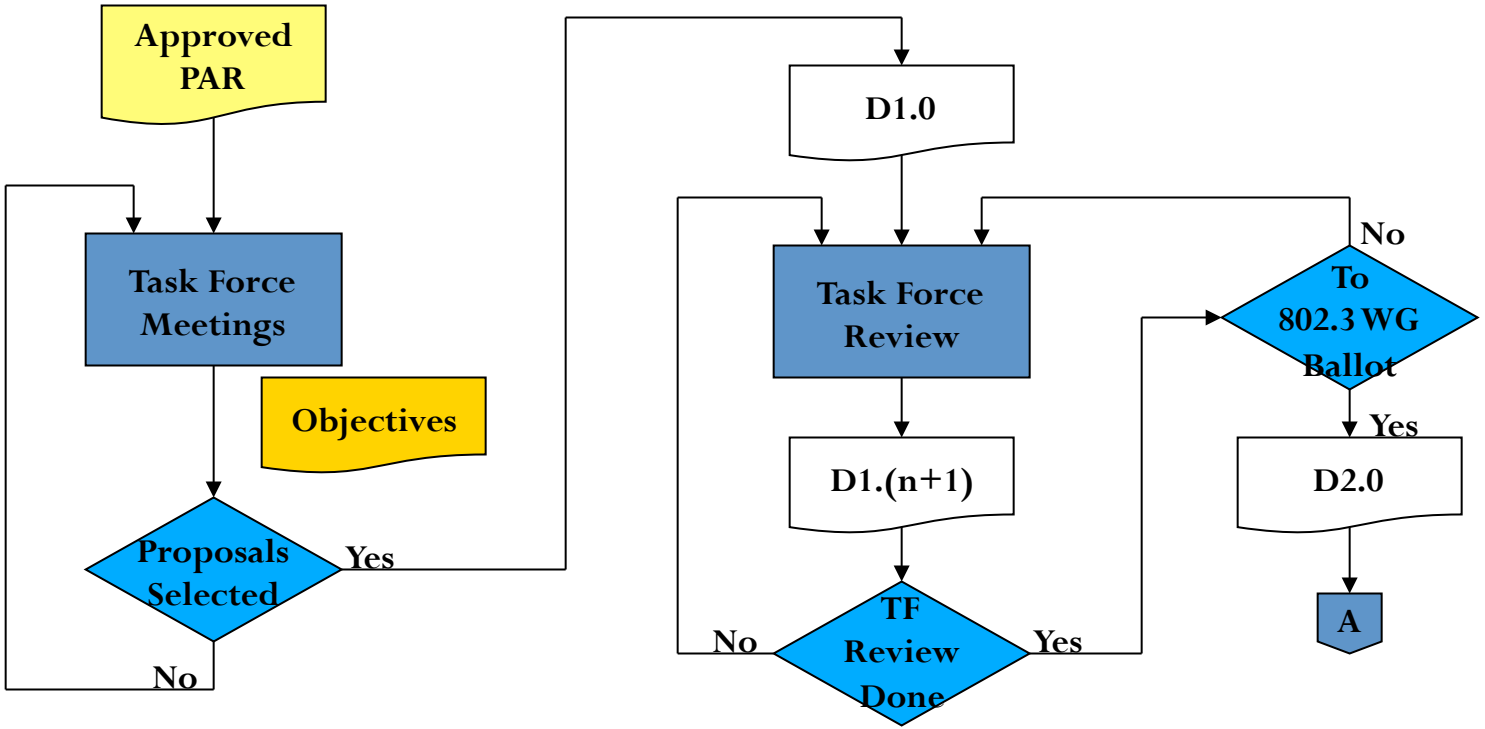
IEEE-SA Standards Board Patent Committee

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

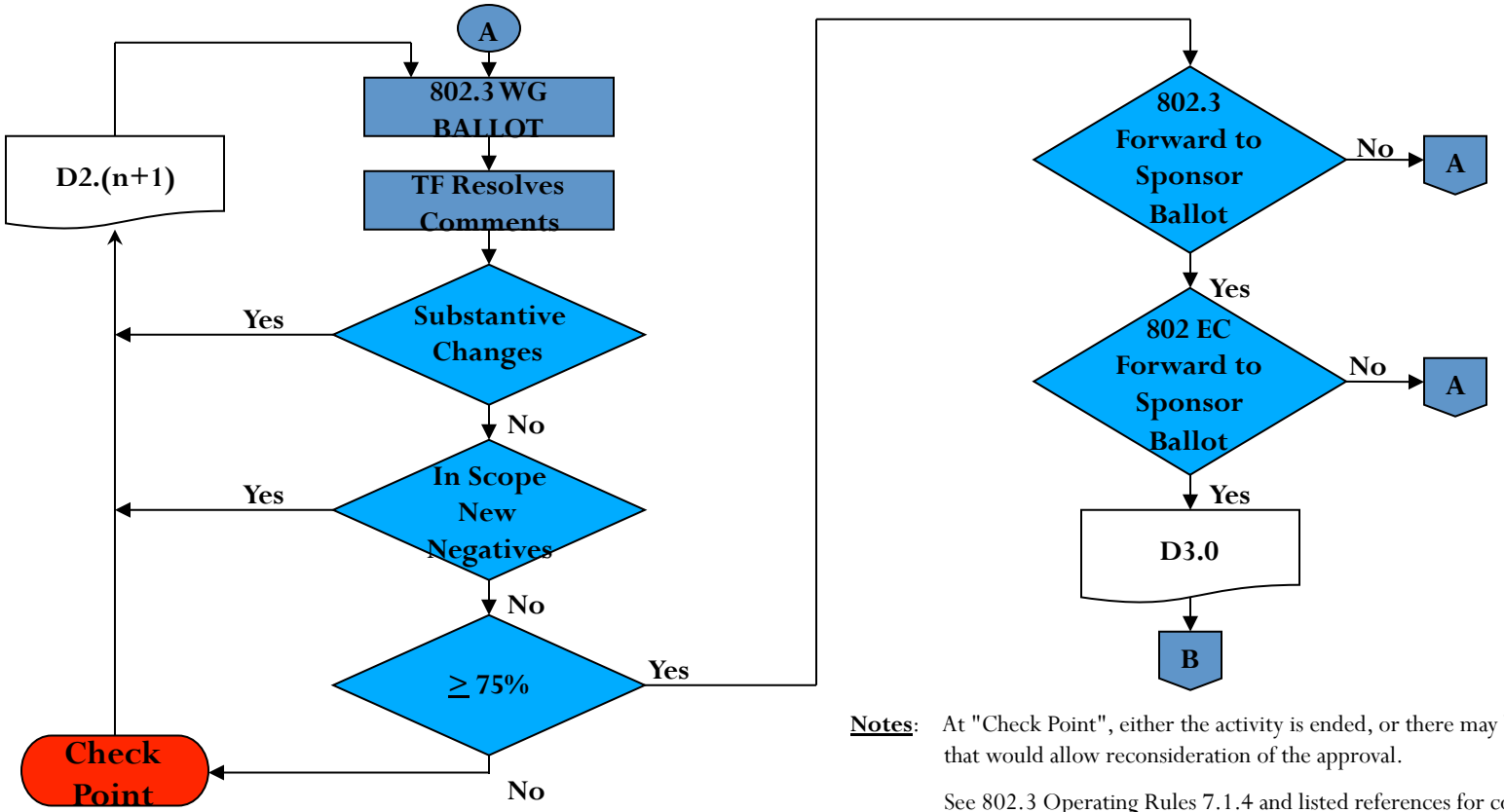


Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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



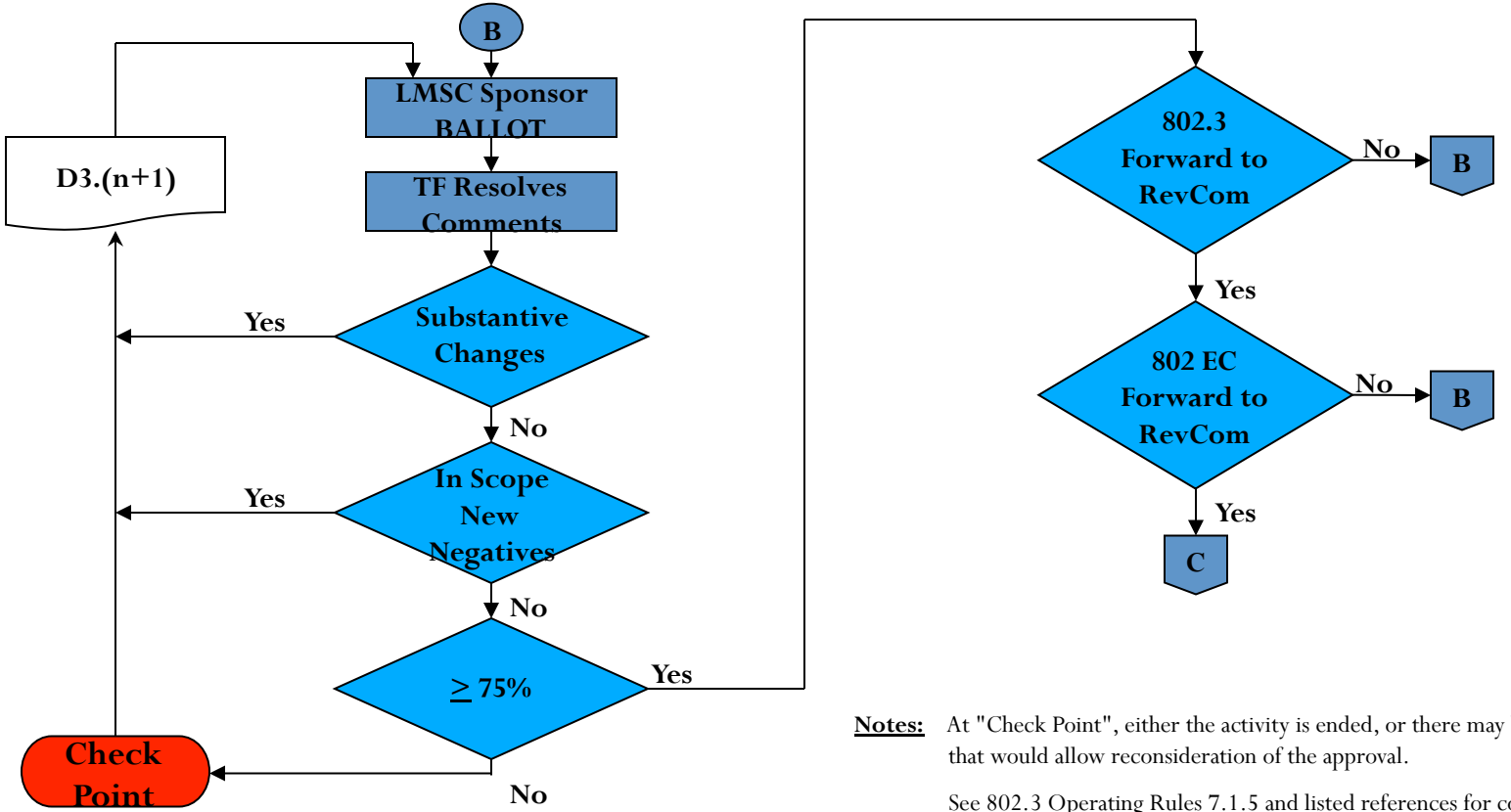
Overview of IEEE 802.3 Standards Process (3/5) – Working Group Ballot Phase



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

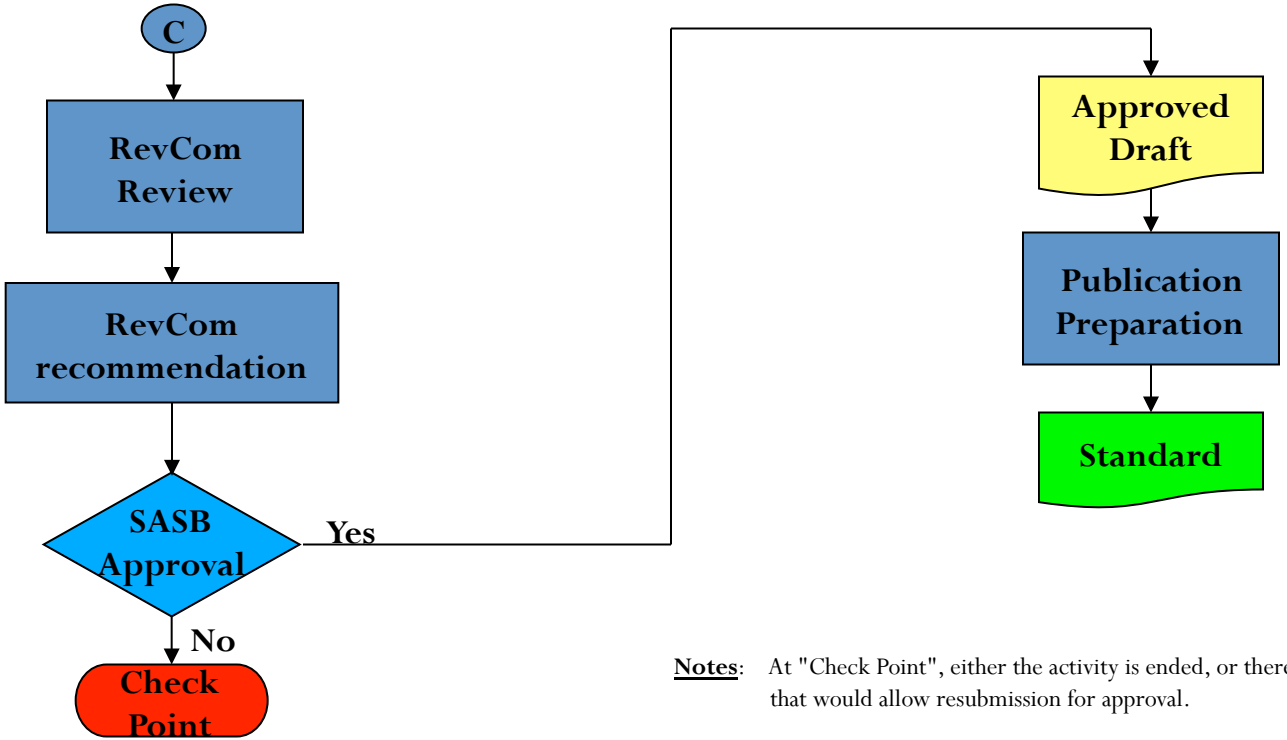
Overview of IEEE 802.3 Standards Process (4/5)- Sponsor Ballot Phase



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

CFI Motion @ Nov Closing Plenary

Move that the IEEE 802.3 Working Group request the formation of two Study Groups to develop Project Authorization Requests (PAR) and Criteria for Standards Development (CSD) responses for:

- **50 Gigabit/s Ethernet over a single lane**
- **Next Generation 100 Gb/s Ethernet & 200 Gigabit/s Ethernet**

M: Mark Nowell

S: John D'Ambrosia

Procedural (>50%)

Y: 74 N: 0 A: 2

Crash course on Study Group goals

For an excellent overviews of the Study Group activities please refer to:

Overview of the Process – Wael Diab
http://www.ieee802.org/3/400GSG/public/13_05/diab_400_01_0513.pdf

Review of the 5 Criteria – Howard Frazier
http://www.ieee802.org/3/400GSG/public/13_05/frazier_400_01_0513.pdf

Guidelines for Project Objectives – Howard Frazier
http://www.ieee802.org/3/400GSG/public/13_05/frazier_400_02_0513.pdf

The following slides are taken from these excellent presentations

What does the Study Group produce?

- 5 Criteria
  - Broad Market Potential, Compatibility, Distinct Identity, Technical Feasibility, Economic Feasibility
- PAR
  - Your “contract” with the IEEE-SA and “authorization” to develop a standard
  - Broadly focuses on what the standard is that group will work on including scope, purpose, broad timeline (not a project plan)
  - Good idea to look at examples of prior projects
- Objectives
  - Your “contract” with 802.3
  - At a high level it is what the group will work on (and what it will not)
  - Somewhat more specific than the scope in the PAR

From:
Overview of the Process – Wael Diab
http://www.ieee802.org/3/400GSG/public/13_05/diab_400_01_0513.pdf

Final Thoughts

- Goal is to get to a Task Force
- To do that, focus on
  - Producing the objectives
  - Producing the PAR
  - Producing the 5 criteria
  - Work on building consensus
  - Leave the rest of it to the Task Force phase
    - Plenty of time to work on solutions
    - Plenty of time to debate the text of the solutions

From:
Overview of the Process – Wael Diab
http://www.ieee802.org/3/400GSG/public/13_05/diab_400_01_0513.pdf

History and traditions

- Project objectives are brief statements, usually written in bullet form, that summarize the technical objectives for a standards project in IEEE 802.3
- They represent a distilled set of high-level technical requirements
- They are created by the study group, approved by the parent working group, and are fulfilled by the task force
  - The task force may modify them, with the approval of the working group
- They typically address areas such as operating speed (bit rate), media, reach, BER, compatibility, impairments, coexistence
- Note that some other working groups address such areas in their Project Authorization Request, but we tend not to do this
- Every project undertaken in the IEEE 802.3 working group since (at least) 1992 has been guided by a set of objectives

From:
Guidelines for Project Objectives – Howard Frazier
http://www.ieee802.org/3/400GSG/public/13_05/frazier_400_02_0513.pdf

Guidelines for writing and adopting

- Consensus building is key
  - Don't even think about offering up a motion to adopt an objective until you know you have significant support for it, otherwise, things will get ugly
- Offer objectives one at a time, using a motion like this:

  Example - for illustrative purposes only!
  - Move that the Study Group adopt the following objective:
    - Provide a BER of 10^{-12} or better at the MAC/PLS service interface
- All votes on objectives are technical, requiring ≥ 75% approval
- Sometimes, we trying adopting just the form of an objective, before we can reach agreement on the specific values
  - These are called "Mad-libs" objectives

  Example - for illustrative purposes only!
  - Move that the Study Group adopt the following objective:
    - Provide a BER of 10^{-n} or better at the MAC/PLS service interface
  - This is not the preferred approach!

From:
Guidelines for Project Objectives – Howard Frazier
http://www.ieee802.org/3/400GSG/public/13_05/frazier_400_02_0513.pdf

Audience

- The 5 criteria are drafted and approved by a study group
- They are reviewed and approved (individually) by the working group
- They are subject to review and approval by each and every other working group in IEEE 802®
- They are reviewed and approved by the IEEE 802 executive committee

From:
Review of the 5 Criteria – Howard Frazier
http://www.ieee802.org/3/400GSG/public/13_05/frazier_400_01_0513.pdf

Purpose

- The 5 criteria are used to evaluate proposed projects
- They are used to filter out projects that are not appropriate for standardization in IEEE 802
- They are unique to IEEE 802
- They are one of the reasons why IEEE 802 standards are relatively successful
- They help perpetuate the “IEEE 802 culture”

From:
Review of the 5 Criteria – Howard Frazier
http://www.ieee802.org/3/400GSG/public/13_05/frazier_400_01_0513.pdf

The 5 Critters

Broad Market Potential

Compatibility

Distinct Identity

Technical Feasibility

Economic Feasibility

From:
Review of the 5 Criteria – Howard Frazier
http://www.ieee802.org/3/400GSG/public/13_05/frazier_400_01_0513.pdf

Managed Objects

Describe the plan for developing a definition of managed objects. The plan shall specify one of the following:

a) The definitions will be part of this project.

b) The definitions will be part of a different project and provide the plan for that project or anticipated future project.

c) The definitions will not be developed and explain why such definitions are not needed.

Coexistence

A WG proposing a wireless project shall demonstrate coexistence through the preparation of a Coexistence Assurance (CA) document unless it is not applicable.

a) Will the WG create a CA document as part of the WG balloting process as described in Clause 13?

b) If not, explain why the CA document is not applicable

- A CA document is not applicable because the proposed project is not a wireless project.

Broad Market Potential

Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:

a) **Broad sets of applicability.**
b) **Multiple vendors and numerous users.**
c) **Balanced Costs (LAN versus attached stations) [Removed from IEEE 802 5 Criteria Nov 2012]**

Compatibility

Each proposed IEEE 802 LMSC standard should be in conformance with IEEE Std 802, IEEE 802.1AC, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 WG prior to submitting a PAR to the Sponsor.

a) **Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q?**
b) **If the answer to a) is "no", supply the response from the IEEE 802.1 WG.**
c) **Compatibility with IEEE Std 802.3**
d) **Conformance with the IEEE Std 802.3 MAC**
e) **Managed object definitions compatible with SNMP (see Managed Objects)**

Distinct Identity

Each proposed IEEE 802 LMSC standard shall provide evidence of a distinct identity. Identify standards and standards projects with similar scopes and for each one describe why the proposed project is substantially different.

Substantially different from other IEEE 802.3 specifications / solutions.

Technical Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence that the project is technically feasible within the time frame of the project. At a minimum, address the following items to demonstrate technical feasibility:

a) Demonstrated system feasibility.

b) Proven similar technology via testing, modeling, simulation, etc.

Economic Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence of economic feasibility. Demonstrate, as far as can reasonably be estimated, the economic feasibility of the proposed project for its intended applications. Among the areas that may be addressed in the cost for performance analysis are the following:

a) Balanced costs (infrastructure versus attached stations).
b) Known cost factors.
c) Consideration of installation costs.
d) Consideration of operational costs (e.g. energy consumption).
e) Other areas, as appropriate.

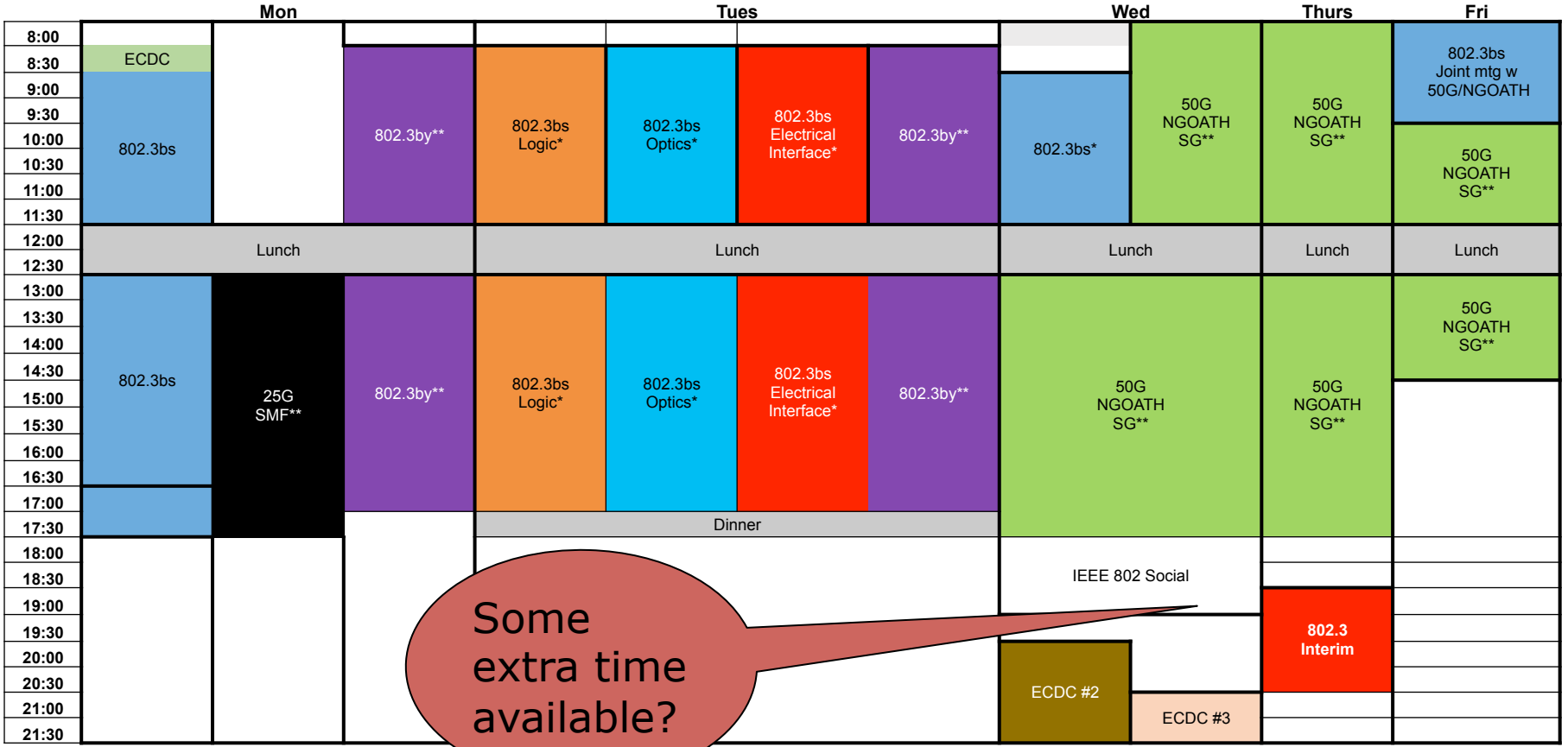
Goals for the meeting

- Develop a set of objectives for the Study Groups
- Develop responses for the CSD (Criteria for Standards Development)
- Develop PAR(s)
- Review presentations substantiating the above

- Lay the ground work for the next meeting

Meeting Map

Courtesy John D'Ambrosia



Meeting Schedule

Wednesday 20-Jan-16	Time	Presenter	Affiliation	Title	File Name	Duration
	8:00 AM	Mark Nowell	Cisco	Agenda and General Information	agenda_50GE_NGOATH_01_0116.pdf	1:00
	9:00 AM	Kent Lusted	Intel	50 Gb/s and NGOATH Ethernet Ad-hoc report	lusted_50GE_NGOATH_01_0116.pdf	0:10
	9:10 AM	Mark Nowell	Cisco	Study Groups Procedural Progress	nowell_50GE_NGOATH_01_0116.pdf	0:30
	9:40 AM	Scott Kipp	Brocade	Switch Designs for 50GbE and 200GbE	kipp_50GE_NGOATH_01_0116.pdf	0:20
	10:00 AM	Brad Booth	Microsoft	50G, 100G and 200G Server Connectivity.	booth_50GE_NGOATH_01_0116.pdf	0:20
	10:20 AM	**Break**				0:15
	10:35 AM	Gary Nicholl	Cisco	Thoughts on 50Gb/s ASIC IO and backwards compatibility considerations for 50G, 100G and 200G	nicholl_50GE_NGOATH_01_0116.pdf	0:20
	10:55 AM	Rob Stone	Broadcom	Compatibility Considerations for 50 and 100G	stone_50GE_NGOATH_01_0116.pdf	0:20
	11:15 AM	Tom Palkert	Luxtera, Molex	Breakout applications and impacts on objectives for 50/200G Ethernet	palkert_50GE_NGOATH_01_0116.pdf	0:20
	11:35 AM	Mark Gustlin	Xilinx	Architecture Options and Technical Feasibility of 50GbE	gustlin_50GE_NGOATH_02_0116.pdf	0:20
	11:55 AM	Mark Gustlin	Xilinx	Architecture options and Technical feasibility of 200GbE	gustlin_50GE_NGOATH_01_0116.pdf	0:20
	12:15 PM	**Lunch**				1:05
	1:20 PM	Ali Ghiasi	Ghiasi Quantum	50 and 200 GbE architecture and PMD requirements	ghiasi_50GE_NGOATH_01_0116.pdf	0:20
	1:40 PM	Rob Stone	Broadcom	The Case for 100G Over Two Lanes	stone_50GE_NGOATH_02_0116.pdf	0:20
	2:00 PM	Xinyuan Wang	Huawei	Technical Feasibility of MAC and PCS layer	wang_50GE_NGOATH_01_0116.pdf	0:20
	2:20 PM	Yu (Helen) Xu	Huawei	Technical Feasibility of SMF PMDs with RS FEC	xu_50GE_NGOATH_01_0116.pdf	0:20
	2:40 PM	Paul Kolesar	Commscope	Wideband MMF for single pair 200GE	kolesar_50GE_NGOATH_01_0116.pdf	0:20
	3:00 PM	Jonathan King	Finisar	50G over MMF objectives	king_50GE_NGOATH_01_0116.pdf	0:20
	3:20 PM	**Break**				0:15
	3:35 PM	Chris Cole	Finisar	50Gb/s and 200Gb/s SMF PMD Specifications and Objectives Proposal	cole_50GE_NGOATH_01_0116.pdf	0:20
	3:55 PM	Chris Cole	Finisar	100Gb/s SMF PMD Specifications and Objectives Proposal	cole_50GE_NGOATH_02_0116.pdf	0:20
	4:15 PM	Matt Brown	APM	Electrical PMD Objectives	brown_50GE_NGOATH_01_0116.pdf	0:20
	4:35 PM	Chris Roth	Molex	Sample Copper Cable Data for 50 Gb/s Ethernet	roth_50GE_NGOATH_01_0116.pdf	0:20
	4:55 PM	Phil Sun	Credo	No-FEC link for 50GE	sun_50GE_NGOATH_01_0116.pdf	0:20
	5:15 PM	Discussion and Straw Polls				1:00
	6:15 PM	**Break**				

Note –Times listed are subject to change.

Updated versions will be captured with new filename versions

Not all contributed presentations are scheduled. Will depend on comment resolution schedule.

Meeting Schedule

Thursday 21-Jan-16

Time	Presenter	Affiliation	Title	File Name	Duration
8:00 AM	Mark Nowell	Cisco	Opening		0:10
8:10 AM	Steve Trowbridge	Alcatel-Lucent	OTN Support for 50GbE, next generation 100GbE, 200GbE	trowbridge_50GE_NGOATH_01_0116.pdf	0:20
8:30 AM	Objectives Discussion, Straw Polls & Motions				1:30
10:00 AM	**Break**				0:20
10:20 AM	Objectives Discussion, Straw Polls & Motions				0:40
11:00 AM	Peter Stassar	Huawei	Bringing 200GE SMF objectives into 802.3bs	stassar_50GE_NGOATH_01_0116.pdf	0:20
11:20 AM	John D'Ambrosia	Futurewei	Strawman: Proposed Changes to 802.3bs Project Documentation	dambrosia_50GE_NGOATH_01_0116.pdf	0:20
11:40 AM	John D'Ambrosia	Futurewei	200 GbE Architecture Development	dambrosia_50GE_NGOATH_02_0116.pdf	0:20
12:00 PM	**Lunch**				1:00
1:00 PM	Work Partitioning Discuss and Decide				1:45
	Study Group Documentation (CSD, PARs etc) Presentation Review, Discussion, Polls, Motions				
2:45 PM	**Break**				0:15
3:00 PM	Study Group Documentation (CSD, PARs etc) Presentation Review, Discussion, Polls, Motions				3:00
6:00 PM	**Break**				0:15

Friday 22-Jan-16

Time	Presenter	Affiliation	Title	File Name	Duration
8:00 AM	Joint session with 802.3bs				1:00
9:00 AM	Mark Nowell	Cisco	Opening		0:10
9:10 AM	Study Group Documentation (CSD, PARs etc) Presentation Review, Discussion, Polls, Motions				0:50
10:00 AM	**Break**				0:15
10:15 AM	Study Group Documentation (CSD, PARs etc) Presentation Review, Discussion, Polls, Motions				1:45
12:00 PM	**Lunch**				1:00
1:00 PM	Study Group Documentation (CSD, PARs etc) Presentation Review, Discussion, Polls, Motions				0:50
1:50 PM	Closing business and motions				0:10
2:00 PM	**Adjorn**				

Note –Times listed are subject to change.

Updated versions will be captured with new filename versions

Not all contributed presentations are scheduled. Will depend on comment resolution schedule.

Future Meetings & Ad hocs

- Ad-hoc meeting plans
  - Single on-going weekly meetings, all topics (will cycle) – agendas will be published. 2 hr duration.
  - Joint with P802.3by Task Force
- See: http://www.ieee802.org/meeting/index.html
- March 2016 Plenary
  - Week of March 13th, 2016 – Macau, China
- May 2016 Interim
  - Week of May 23rd, 2016 – Whistler, B.C., Canada
- July 2016 Plenary
  - Week of July 24th, 2016 – San Diego, CA

- Anyone interested in hosting a interim meeting contact me or the IEEE 802.3 Executive Secretary Steve Carlson.

Thank You!