IEEE 802.3
Higher Speed Study Group

Agenda and General Information

Orlando, Florida
March, 2007

Agenda

- Welcome and Introductions
- Appoint/Volunteer Recording Secretary
- Approve Agenda
- Approve Meeting Minutes
- Goals for this Meeting
- Ground Rules
- Reflector and Web
- IEEE
  - Structure
  - Bylaws and Rules
  - Call for Patents
  - IEEE Standards Process
- Ad Hoc Reports
- Presentations
- Discussion and Motions
- Future Meetings

IEEE 802.3 HSSG Organization

- Study Group Chair:
  - John D'Ambrosia (jdambrosia@force10networks.com)
- Web Master
  - Frank Chang (ychang@vitesse.com)

- "Reach" Ad Hoc Chair
  - Andy Moorwood (amoorwood@extremenetworks.com)
- "Fiber Optic" Ad Hoc Chair
  - Dan Dove (dan.dove@hp.com)

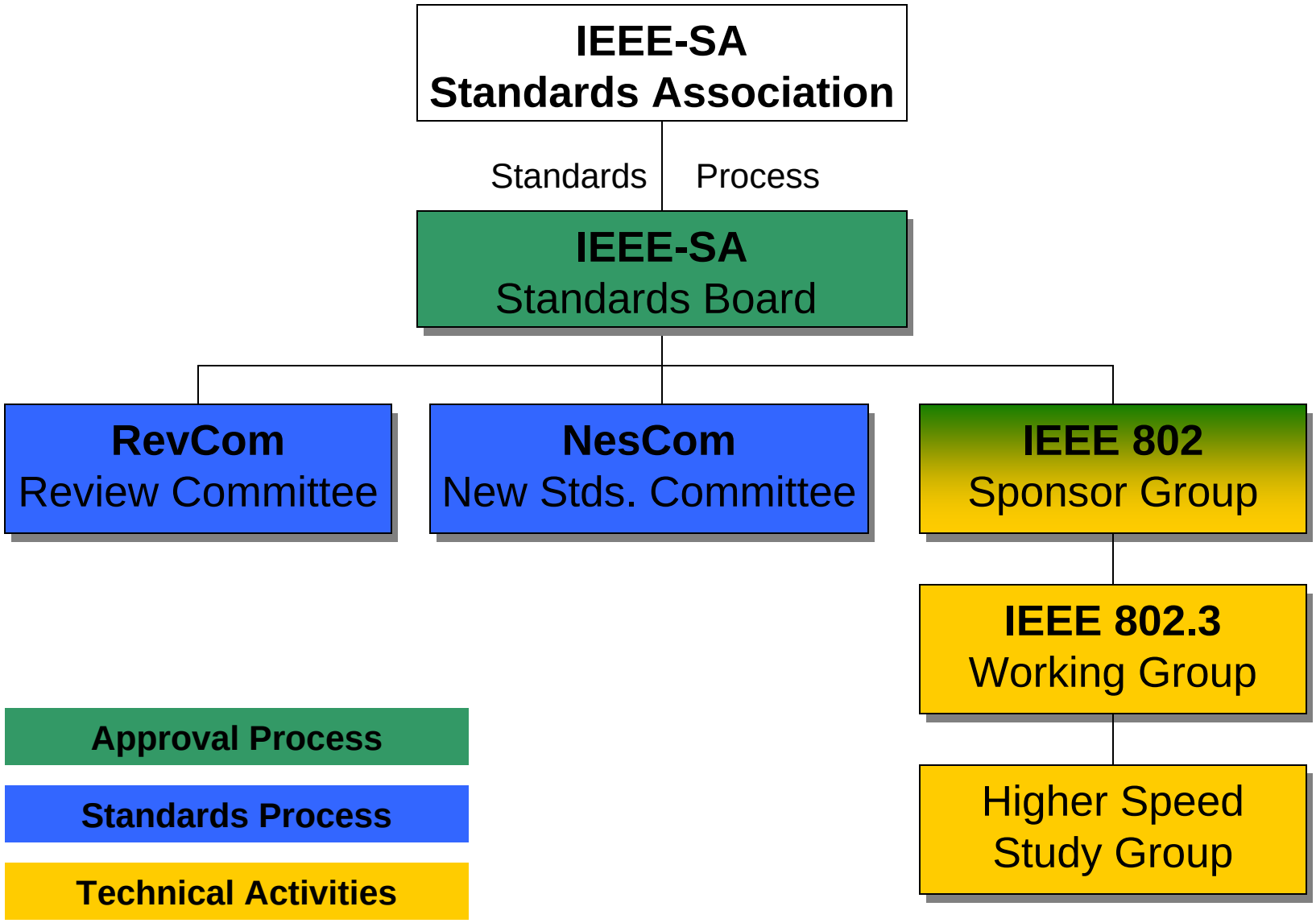
Goals for this Meeting

- Hear presentations related to objectives and 5 Criteria
- Finalize HSSG Objectives
- Finalize number of recommended PAR
- Start developing consensus on:
  - Project Authorization Request (PAR)s
  - 5 Criteria Responses
- Refinement of PAR A
- Tutorial Preparations

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



Bylaws and Rules

- 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***
- LAN/MAN Standards Committee (LMSC) Policies and Procedures:
  - ***http://ieee802.org/policies-and-procedures.pdf***
- IEEE 802.3 Working Group Operating Rules:
  - ***http://ieee802.org/3/rules/P802_3_rules.pdf***

IEEE-SA Standards Board Bylaws on Patents in Standards

6. Patents

IEEE standards may include the known use of essential patents and patent applications provided the IEEE receives assurance from the patent holder or applicant with respect to patents whose infringement is, or in the case of patent applications, potential future infringement the applicant asserts will be, unavoidable in a compliant implementation of either mandatory or optional portions of the standard [essential patents]. This assurance shall be provided without coercion. The patent holder or applicant should provide this assurance as soon as reasonably feasible in the standards development process. This assurance shall be provided no later than the approval of the standard (or reaffirmation when a patent or patent application becomes known after initial approval of the standard). This assurance shall be either:

a) A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement either mandatory or optional portions of the proposed IEEE standard against any person or entity complying with the standard; or

b) A statement that a license for such implementation will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination.

This assurance is irrevocable once submitted and accepted and shall apply, at a minimum, from the date of the standard's approval to the date of the standard's withdrawal.

Approved by IEEE-SA Standards Board – March 2003 (Revised February 2006)

Inappropriate Topics for IEEE WG Meetings

- Don't discuss the validity/essentiality of patents/patent claims
- Don't discuss the cost of specific patent use
- Don't discuss licensing terms or conditions
- Don't discuss product pricing, territorial restrictions, or market share
- Don't discuss ongoing litigation 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/board/pat/index.html

This slide set is available at http://standards.ieee.org/board/pat/pat-slideset.ppt

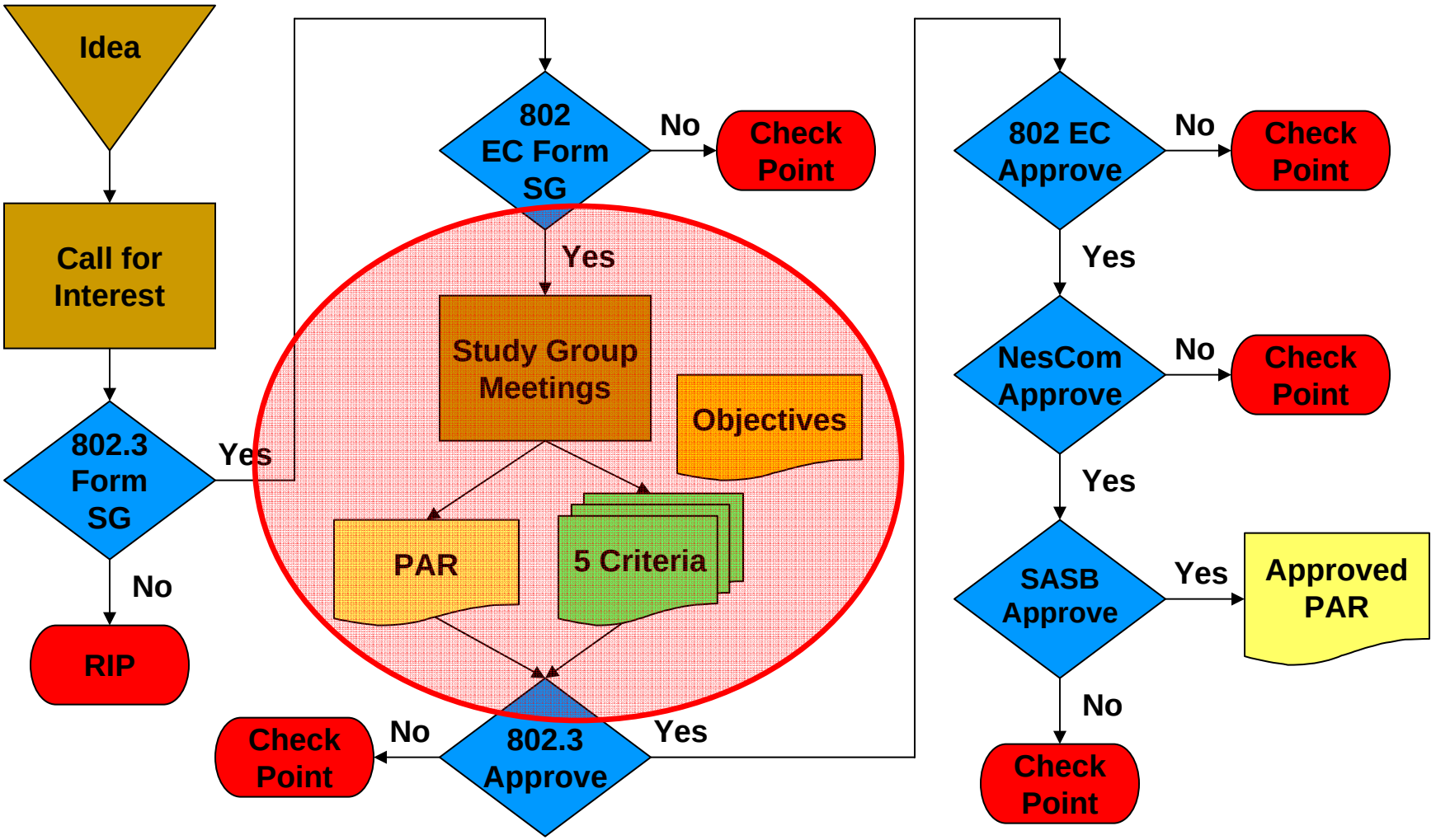
Approved by IEEE-SA Standards Board – March 2003 (Revised February 2006)

The Study Group

- Normal function is to draft a complete PAR and Five Criteria
- Provide a plenary week tutorial to the LMSC.
- Gain approval at the WG 802.3, 802 SEC, IEEE NesCom and IEEE-SA Standards Board.
- SG only exists for 6 months
  - Extensions can be requested, voted on by 802.3, ratified by SEC
- Development of Objectives helps set the goals for the Task Force
- Consensus (>75%) required to move forward

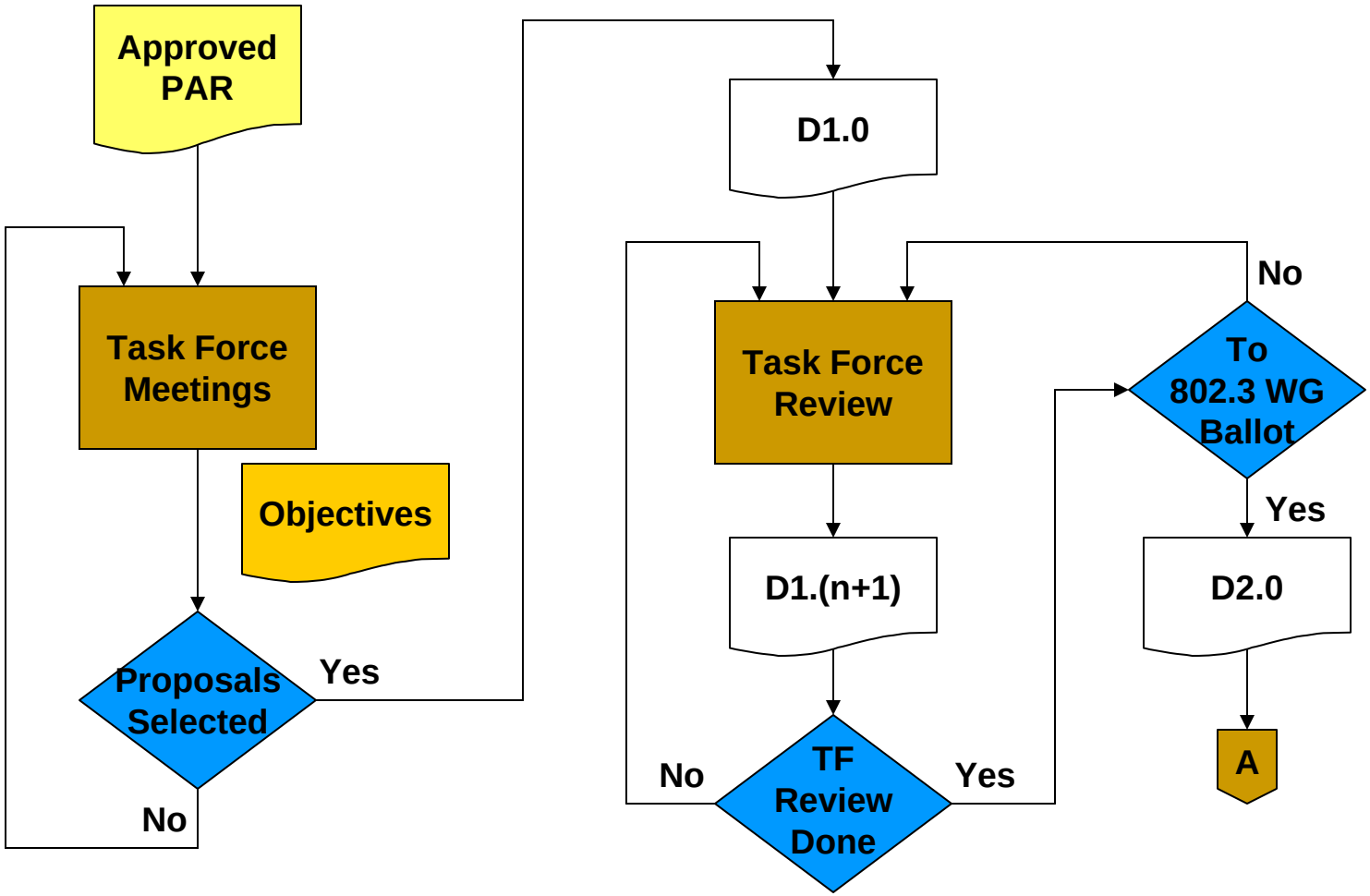
- Not a goal – choosing a solution.

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

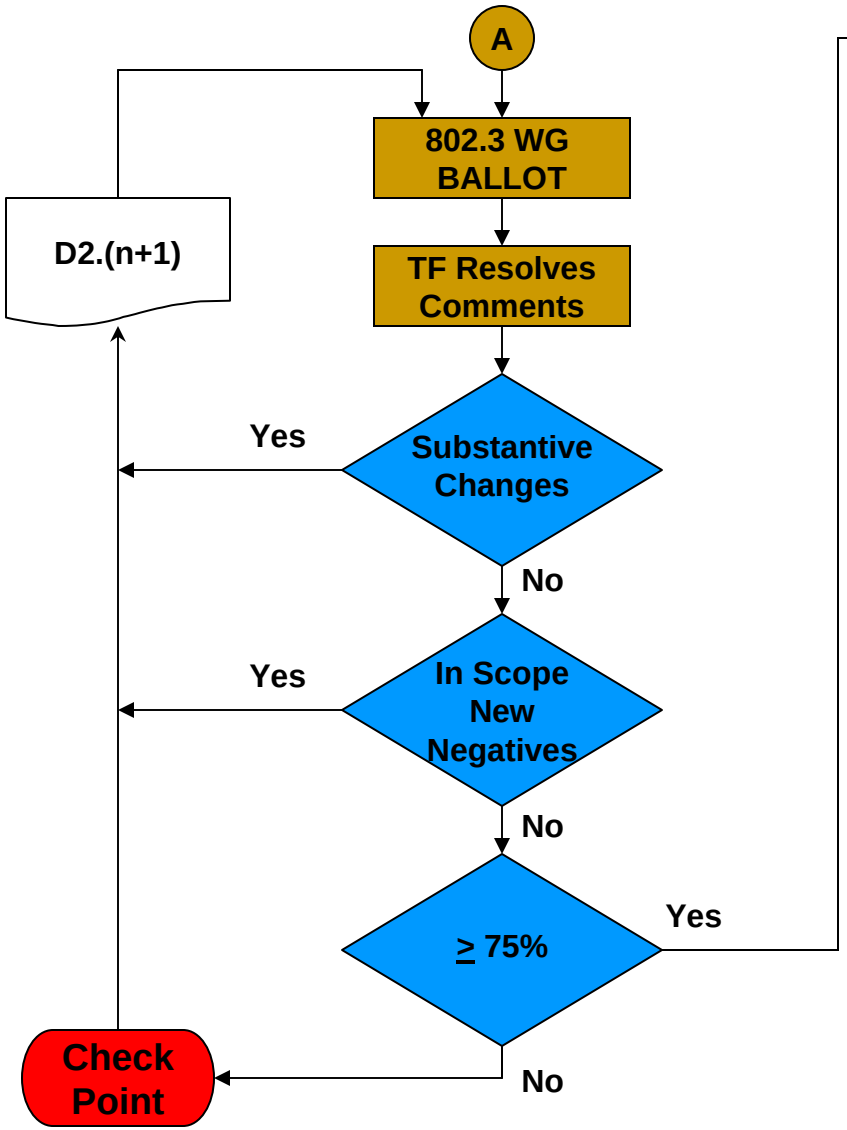


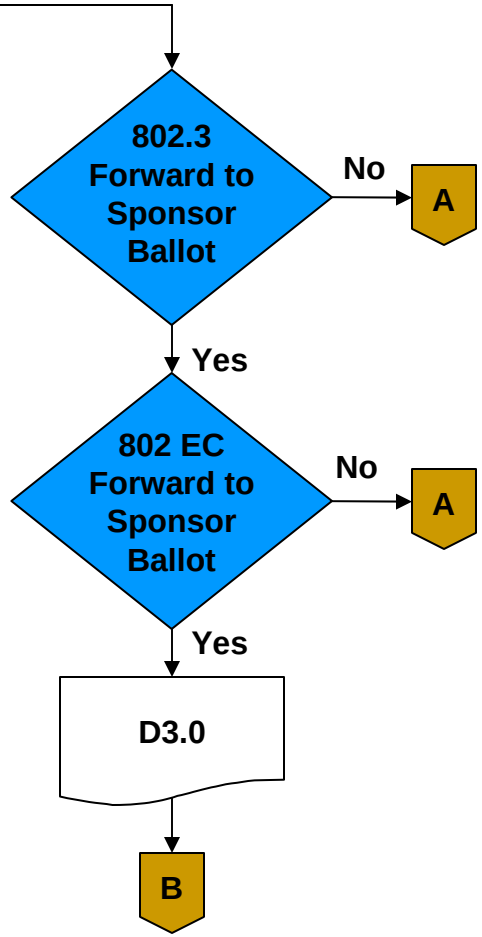
Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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

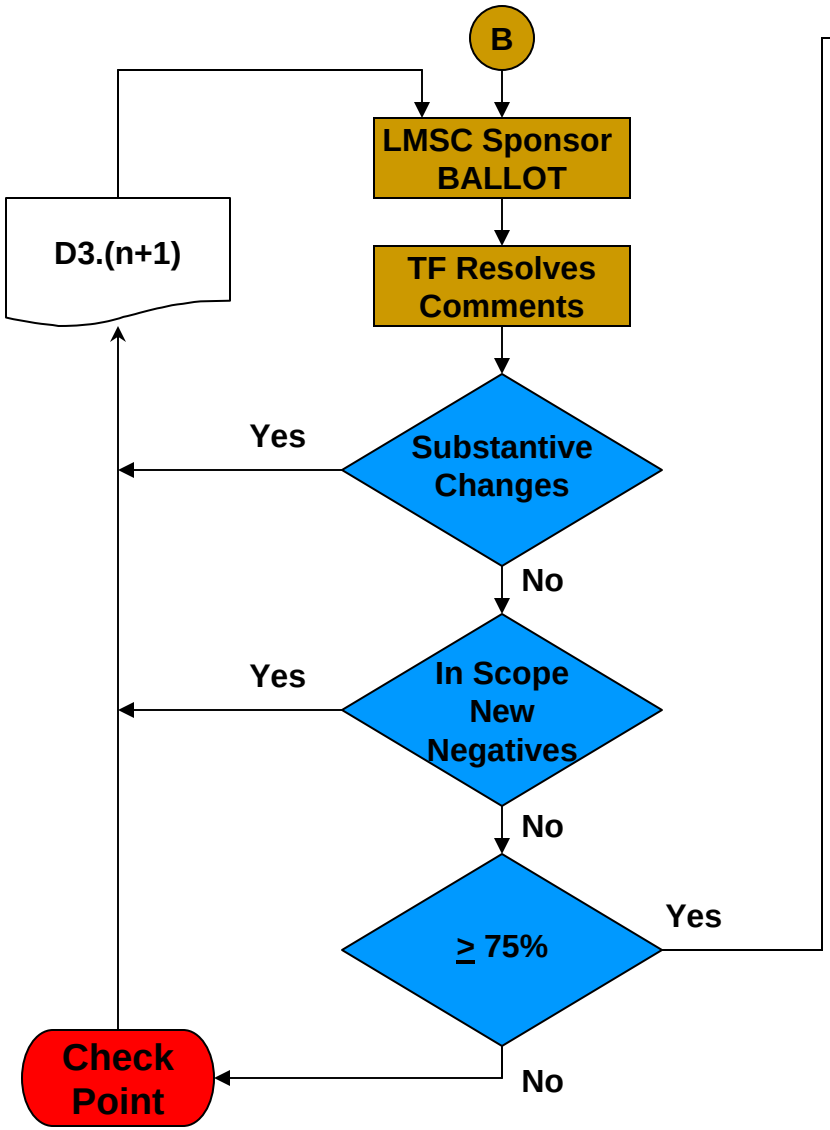


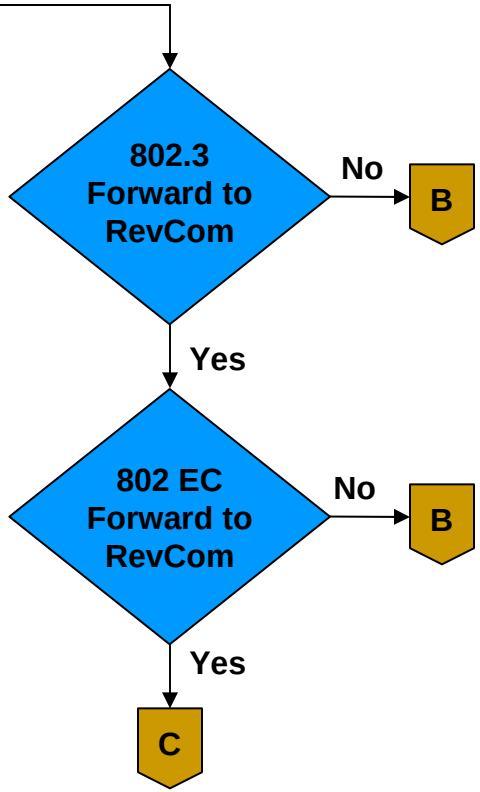


Notes: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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

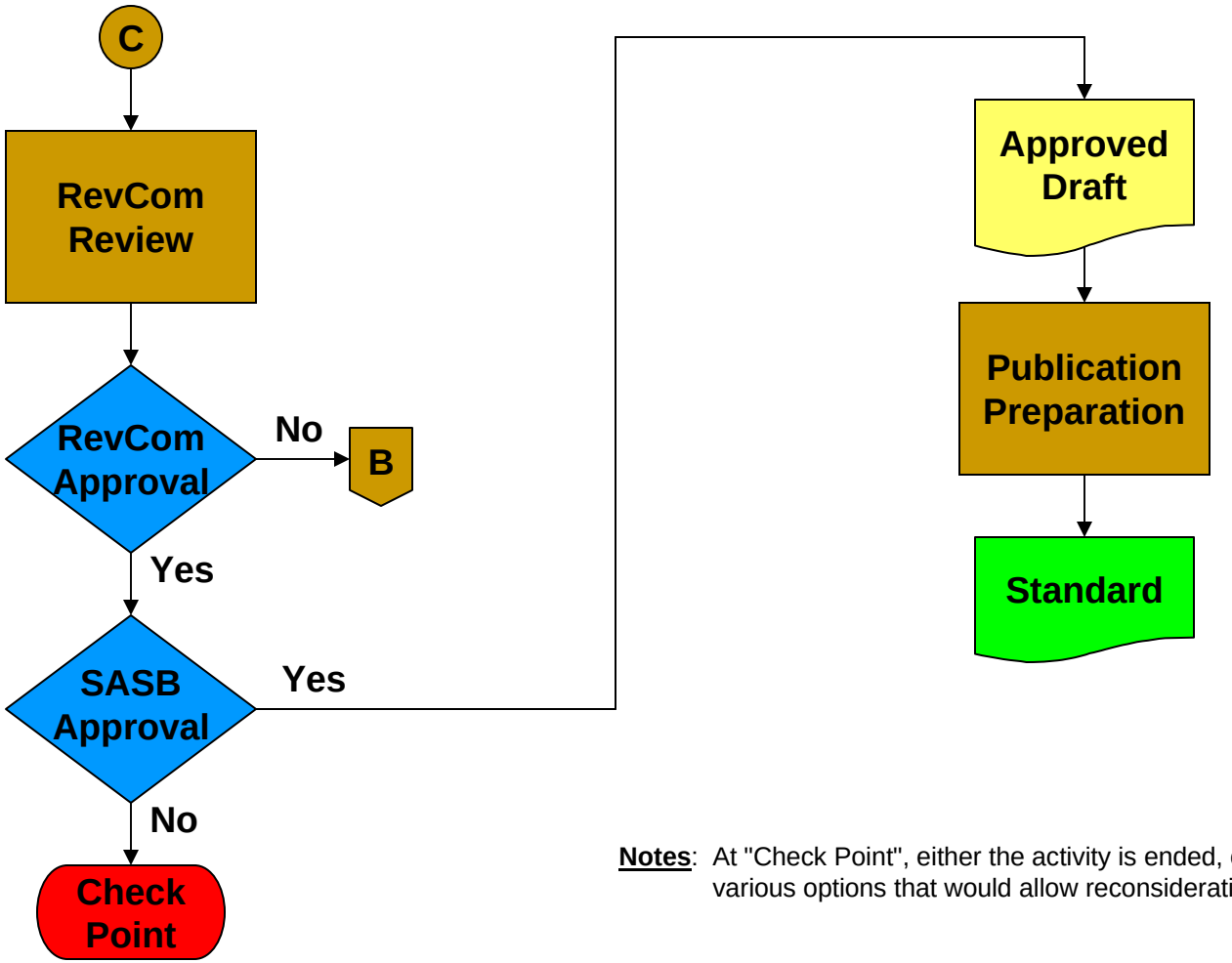




Notes: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

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 reconsideration of the approval.

Request for Formation of HSSG (as per July '06 Plenary Motion)

Move the IEEE 802.3 Working Group requests formation of a "Higher Speed Study Group" to evaluate definition of greater than 10 Gb/s MAC data rate and related PHY capability to IEEE Std 802.3. The Study Group may recommend one or more PARs.

January 2007 Interim Motions

- Motions
  - The HSSG has demonstrated technical feasibility for a 10km single mode 100 Gb/s PMD. (A: 67/0/14, 802.3: 25/0/4)
  - The HSSG has demonstrated technical feasibility for a 100m multi-mode 100 Gb/s PMD. (A: 64/0/17, 802.3: 23/0/7)
- Determined one PAR (PAR A) from subset of objectives
  - Adopted Working Draft of PAR (All: 54/1/7, 25/1/4)
  - Adopted Working Draft for 5 Criteria Responses
    - Broad Market Potential (All: 39/4/9, 802.3: 15/3/7)
    - Distinct Identity (All: 53/1/5, 802.3: 26/1/3)
    - Compatibility (All: 54/1/6, 802.3: 25/1/5)
    - Technical Feasibility (All: 57/2/6, 802.3: 21/2/4)
    - Economic Feasibility (All: 48/4/8, 802.3: 21/3/7)

HSSG Objectives

- Support full-duplex operation only (approved 11/16/06: All 73/0/4)
- Preserve the 802.3 / Ethernet frame format at the MAC Client service interface (approved 11/16/06: All 76/0/4)
- Preserve minimum and maximum FrameSize of current 802.3 Std (approved 11/16/06: All 74/0/4)
- Support a speed of 100 Gb/s at the MAC/PLS interface (approved 11/16/06: All 67/9/14, 802.3 26/4/11)
- Support at least 10km on SMF. (approved 11/16/06: All 86/0/4, 802.3 40/0/4)
- Support at least 100 meters on OM3 MMF. (approved 11/16/06, All 61/3/27, 802.3 33/2/13)
- Support a BER better than or equal to 10^{-12} at the MAC /PLS service interface. (approved 1/19/07, All 68/0/4).
- Support at least 40-km on SMF. (approved 1/19/07, All 38/10/32, **802.3 12/6/16**).

Updated Jan 19, 2007

HSSG PAR A

- Objectives
  - Support full-duplex operation only.
  - Preserve the 802.3/Ethernet frame format at the MAC Client service interface.
  - Preserve minimum and maximum FrameSize of current 802.3 Std.
  - Support a speed of 100 Gb/s at the MAC/PLS service interface.
  - Support at least 10km on SMF.
  - Support at least 100 meters on OM3 MMF.
  - Support a BER better than or equal to 10-12 at the MAC/PLS service interface.

- PAR – Working Draft
  - http://grouper.ieee.org/groups/802/3/hssg/HSSG_PARA_PAR_WD_0107.pdf

- Critters – Working Draft
  - http://grouper.ieee.org/groups/802/3/hssg/HSSG_PARA_5C_WD_0107.pdf

HSSG "PAR A" (Working Draft)

- Title -
  - IEEE Standard for Information Technology - Telecommunications and Information Exchange Between Systems - Local and Metropolitan Area Networks – Specific Requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications – Amendment: Media Access Control Parameters, Physical Layers and Management Parameters for 100 Gb/s Operation
- Scope –
  - Define 802.3 Media Access Control (MAC) parameters, physical layer specifications, and management parameters for the transfer of 802.3 format frames at 100 Gb/s over standardized fiber cabling.
- Purpose
  - The purpose of this project is to extend the 802.3 protocol to an operating speed of 100 Gb/s in order to provide a significant increase in bandwidth while maintaining maximum compatibility with the installed base of 802.3 interfaces, previous investment in research and development, and principles of network operation and management. The project is to provide for the interconnection of equipment satisfying the distance requirements of the intended applications.
- Working Draft - http://grouper.ieee.org/groups/802/3/hssg/HSSG_PARA_PAR_WD_0107.pdf

January 2007 – New Objectives Presentations

- 40Gb/s MAC Rate
  - Presentation by Shimon Mueller
  - Server needs
  - http://grouper.ieee.org/groups/802/3/hssg/public/jan07/muller_01_0107.pdf
- 100G Cu PMD
  - Presentation by Chris DiMinico
  - 5m reach for intra/inter-rack application distances
  - 10m reach for HPC cluster distances
  - http://grouper.ieee.org/groups/802/3/hssg/public/jan07/diminico_01_0107.pdf

January 2007 Interim Strawpolls

- **Straw Poll #3**: Based on adopted objectives (from November Plenary), does the HSSG believe that there is broad market potential for 100 GbE? (All: 52/17/16)
- ***Straw Poll #5:*** The HSSG has demonstrated economic feasibility for a 10km single-mode PMD. [Requested by Dan Dove, FO Ad Hoc Chair] (All: 37/3/38)
- ***Straw Poll #7:*** The HSSG has demonstrated economic feasibility for a 100m multi-mode PMD. [Requested by Dan Dove, FO Ad Hoc Chair] (All: 34/6/39)
- ***Straw Poll #9:*** Should the HSSG continue to study 40 Gb/s operation? (All: 22/33/21)

Checkpoint

- Decisions on objectives (old / new?) / # PAR
- How should the group proceed?
  - Super Project – everything in one PAR
  - Initial Super Project - Split out efforts that lag
  - Study and define all PARs simultaneously
  - SG continuation – serially spinning out PARs

Study Group Schedule

- January, 2007 Interim Meeting
  - Draft Objectives
- March, 2007 Plenary Meeting
  - Complete Objectives (if not complete from Jan)
  - Draft PAR & 5 Criteria
  - Prepare for Tutorial in July
- April, 2007 Interim Meeting
  - Complete PAR & 5 Criteria
- May, 2007 Interim Meeting
  - Complete PAR & 5 Criteria
  - Submit draft to 802 SEC
- July, 2007 Plenary Meeting
  - Execute PAR approval process
  - 802.3 Approve PAR for forwarding to 802 SEC
  - 802 SEC approve and forward to NesCom
- August, 2007
  - Submit PAR to NesCom
- September, 2007
  - If HSSG exists, then it will meet at the September Interim
  - NesCom: Approve PAR
  - IEEE-SA Standards Board Approve PAR
- November 2007 Plenary Meeting
  - First official Task Force Meeting

Meeting Map

	Mon	Tues	Wed	Thur	Fri
8:00	SEC	HSSG Presentations	HSSG Presentations	HSSG Discussions, Motions, Closing	
8:30					
9:00					
9:30					
10:00					
10:30					
11:00	802.0 Plenary				
11:30					
12:00	Lunch	Lunch (1:15PM)	Lunch (1:15PM)	Lunch	
12:30					
13:00	802.3 Plenary			802.3 Plenary	SEC
13:30		HSSG Presentations	HSSG Presentations		
14:00					
14:30					
15:00					
15:30					
16:00					
16:30					
17:00		Dinner	Dinner		
17:30					
18:00	Dinner				
18:30	Tutorial #1	CFI / Tutorial #3	Social		
19:00					
19:30					
20:00	Tutorial #2	Tutorial #4			
20:30					
21:00					
21:30					

Presentations – Tuesday, 3/13

Time	Presenter	Affiliation	Title	File Name
8:30 AM			Agenda and General Information	agenda_01_0307.pdf
9:10 AM	Dan Dove	Procurve Networking by HP	Fiber Optic Ad Hoc Report	dove_01_0307.pdf
9:30 AM	Donn Lee	Google	Saturating 100G and 1T Pipes	lee_01_0307.pdf
9:50 AM	Adam Bechtel	Yahoo!	A Web Company's View on Ethernet	bechtel_01_0307.pdf
10:10 AM	Break			
10:30 AM	Troy Sprenger	EDS	100G Ethernet - Tomorrow Is Too Late	sprenger_01_0307.pdf
10:55 AM	Andy Bach	New York Stock Exchange	Financial Industry Projected Bandwidth Growth	bach_01_0307.pdf
11:25 AM	Ted Seely	Sprint Nextel	Carrier Hurdles To Meeting 10GE Demand	seely_01_0307.pdf
12:00 PM	Lunch			
1:15 PM	Frank Chang	Vitesse	Bandwidth Drivers in Broadband Access - A BMP case study from EPON perspective	chang_01_0307.pdf
1:45 PM	Mark Nowell	Cisco	The Ethernet EcoSystem - Broad Market Potential for 100 Gb Ethernet	goergen_01_0307.pdf
2:15 PM	Chris Cole	Finisar	Broad Market Potential of 100GE Transceivers	cole_02_0307.pdf
2:45 PM	Break			
3:05 PM	Schelto Vandoorn	Intel	Higher Speed Ethernet and Server Requirements	vandoorn_01_0307.pdf
3:25 PM	Howard Frazier	Broadcom	40 Gb/s Ethernet 5 Criteria Responses	frazier_01_0307.pdf
3:55 PM	Joel Goergen	Force10 Networks	Understanding a 40km Reach Objective	goergen_02_0307.pdf
4:25 PM	Ted Woodward	Telcordia Technologies, Inc.	To Infinity and Beyond!": Why 40km+ Links Matter and What HSSG Might Do About It.	woodward_01_0307.pdf
4:55 PM		Discussion		

Note – Order of presentations and times listed are subject to change.

Presentations – Wednesday, 3/14

Time	Presenter	Affiliation	Title	File Name
8:30 AM			Day's Opening Comments	
8:45 AM	Bill Trubey	Time Warner Cable	Future Market Potential for 100G Ethernet, An MSO Perspective by Time Warner Cable	trubey_01_0307
9:05 AM	John Jaeger	Infinera	HSSG Presentation Mapping to 5 Criteria Responses	jaeger_01_0307.pdf jaeger_02_0307.xls
9:30 AM	Jack Jewell	Picolight	10x10G VCSEL Array Feasibility Issues	jewell_01_0307.pdf
9:55 AM	Chris Cole	Finisar	Technical & Economic Feasibility of 10km SMF 100GE Transceivers	cole_01_0307.pdf
10:25 AM	Break			
10:45 AM	Arlon Martin	Kotura	100GbE, 10x10 Alternative	martin_01_0307.pdf
11:05 AM	Matt Traverso	OpNext	Optical Specifications for 10km Link	traverso_02_0307.pdf
11:25 AM	Matt Traverso	OpNext	Approach for 40km PMD	traverso_01_0307.pdf
11:40 AM	Paul Kolesar	Systimax	Updated cost analysis of MMF variants	kolesar_01_0307.pdf
12:00 PM	John Abbott	Corning	Relative cost of 100GbE point-to-point links	abbott_01_0307.pdf
12:00 PM	Lunch			
1:15 PM	Ralf-Peter Braun	T-Systems	100GE - 10 / 40km Economic Feasibility	braun_01_0307.pdf
1:45 PM	Pete Anslow	Nortel	Single Mode Fibre Loss	anslow_01_0307.pdf anslow_02_0307.xls
2:00 PM	Charlie Zhong	LSI	25 Gbps SerDes	zhong_01_0307.pdf
2:30 PM	Steve Trowbridge	Alcatel-Lucent	Mapping of 100 Gbit/s Ethernet into OTN and the need for a Lane Independent PCS	trowbridge_01_0307.pdf
2:50 PM	Chris Diminco	MC Communications	High Speed Study Group objectives and five criteria	diminico_01_0307.pdf
3:10 PM	Break			
3:30 PM	Mike Bennett	LBNL	The Nneed for a low-cost 100GbE inter-rack copper interconnect	bennett_01_0307.pdf
3:40 PM	Chris DiMinico George Zimmerman	MC Communications SolarFlare Communications	Twinaxial cable assembly transmission characteristics	diminico_02_0307.pdf
4:00 PM	Herb Van Deusen	Gore Associates	High Speed Copper Cabling for HSSG	vandeusen_01_0307.pdf
4:10 PM	Carl Booth	Amphenol	24 AWG twinaxial cable structure for 25Gb applications	booth_01_0307.pdf
4:30 PM	Gourgen Oganessyan Jim McGrath	Molex	100G Copper Proposal: Technical Feasibility	oganessyan_01_0307.pdf
5:00 PM	Will Miller	Efficere Technologies	100G Ethernet Test Adapter	miller_01_0307.pdf
5:30 PM		Discussion		

Note – Order of presentations and times listed are subject to change.

Thursday, 3/15

8:30 AM			Day's Opening Comments	
8:45 AM			Discussion & Motions	
10:15 AM	Break			
10:35 AM			Discussion, Motions, and Closing Business	
12:00 PM	Adjourn			

Note – Order of presentations and times listed are subject to change.

Remember to Declare Your Affiliation

- From the IEEE SA Standards Board By-laws
  - **5.2.1.5 Disclosure of affiliation** ((http://standards.ieee.org/guides/bylaws/sect5.html#5.2.1.5)
    - Every member and participant in a working group, Sponsor ballot, or other standards development activity shall disclose his or her affiliation. An individual is deemed "affiliated" with any individual or entity that has been, or will be, financially or materially supporting that individual's participation in a particular IEEE standards activity. This includes, but is not limited to, his or her employer and any individual or entity that has or will have, either directly or indirectly, requested, paid for, or otherwise sponsored his or her participation. Failure to disclose every such affiliation may result in complete or partial loss of rights to participate in IEEE-SA activities. An individual is not excused from compliance with this policy by reason of any claim of a conflicting obligation (whether contractual or otherwise) that prohibits disclosure of affiliation.
- From the IEEE SA Standards Board Operations Manual
  - **5.3.3.1 Disclosure of affiliation** (http://standards.ieee.org/guides/opman/sect5.html#5.3.3.1)
    - Each participant's affiliation shall be disclosed at any working group or project meeting. The chair or the chair's delegate shall inform the meeting of the requirement for disclosure of affiliation (see 5.2.1.5 of the *IEEE-SA Standards Board Bylaws*). This shall be via a sign-in (e.g., sign-in sheet, electronic sign-in, verbal disclosure, or electronic communication) that provides for disclosure of employer and any other affiliation, a reminder of the definition of affiliation, and possible penalties for non-compliance.

      Whenever an individual is aware that the ownership of his or her employer or other affiliation may be material to the process, or when the Sponsor or the IEEE-SA Standards Board requests, that individual shall also declare the "ultimate parent entity" of their affiliation. The ultimate parent entity is an entity that directly or indirectly, through one or more intermediaries, controls the entity identified as the individual's affiliation. For the purposes of this definition, the term "control" and its derivatives, with respect to for-profit entities, means the legal, beneficial or equitable ownership, directly or indirectly, of more than fifty percent (50%) of the capital stock (or other ownership interest, if not a corporation) of an entity ordinarily having voting rights. "Control" and its derivatives, with respect to nonprofit entities, means the power to elect or appoint more than fifty percent (50%) of the Board of Directors of an entity.
  - **5.3.3.2 False or misleading disclosure** (http://standards.ieee.org/guides/opman/sect5.html#5.3.3.2)
    - A meeting attendee who fails to disclose affiliation shall not accrue any membership rights, including rights of or towards voting membership, until such disclosures have been made. The chair shall review the adequacy of disclosures. Failure to disclose affiliation, or materially false or misleading disclosure of affiliation, shall result in loss of membership privileges and may also result in loss of other participation privileges within the IEEE-SA for such participants and any affiliated entities

Future Meetings

- April 2007 HSSG Interim Session
  - April 17 - 19
  - Hosted by Nortel
  - Crowne Plaza Hotel
  - Ottawa, ON, Canada
- May 2007 Interim
  - May 28 – 31
  - ITU
  - Geneva, Switzerland
  - For information, see http://www.ieee802.org/1/files/public/docs2006/meetings-may07-interim+workshop-1106.pdf
- July 2007 IEEE 802 Plenary
  - July 16 – 19
  - Hyatt Regency
  - San Francisco, CA, USA

Thank You!