



**IEEE 802.3
Congestion Management
Study Group**

**San Antonio, TX
16-17 November, 2004**



Agenda

- Welcome and Introductions
- Appoint/Volunteer Recording Secretary
- Approve meeting minutes
- Goals for this Meeting
- Reflector and Web
- Ground Rules
- IEEE
 - Structure
 - Bylaws and Rules
 - Call for Patents
 - IEEE Standards Process
- Presentations
- Discussions
 - 802.1
 - Plans for Thursday
 - Plans for drafts
- Future Meetings



Goals for this Meeting

- Hear presentations concerning:
 - Joint 802.1 work
 - Requirements in the telco space
 - More simulations

- Ensure consensus on:
 - Congestion Management Objectives
 - Responses to the 5 Criteria
 - Project Authorization Request (PAR): Title, Scope, and Purpose



Reflector and Web

- To subscribe to the Congestion Management Study Group reflector send an email to:

listserv@ieee.org

with the following in the body of the message:

***subscribe stds-802-3-cm <your first name>
<your last name>***

- Congestion Management Study Group web page URL:

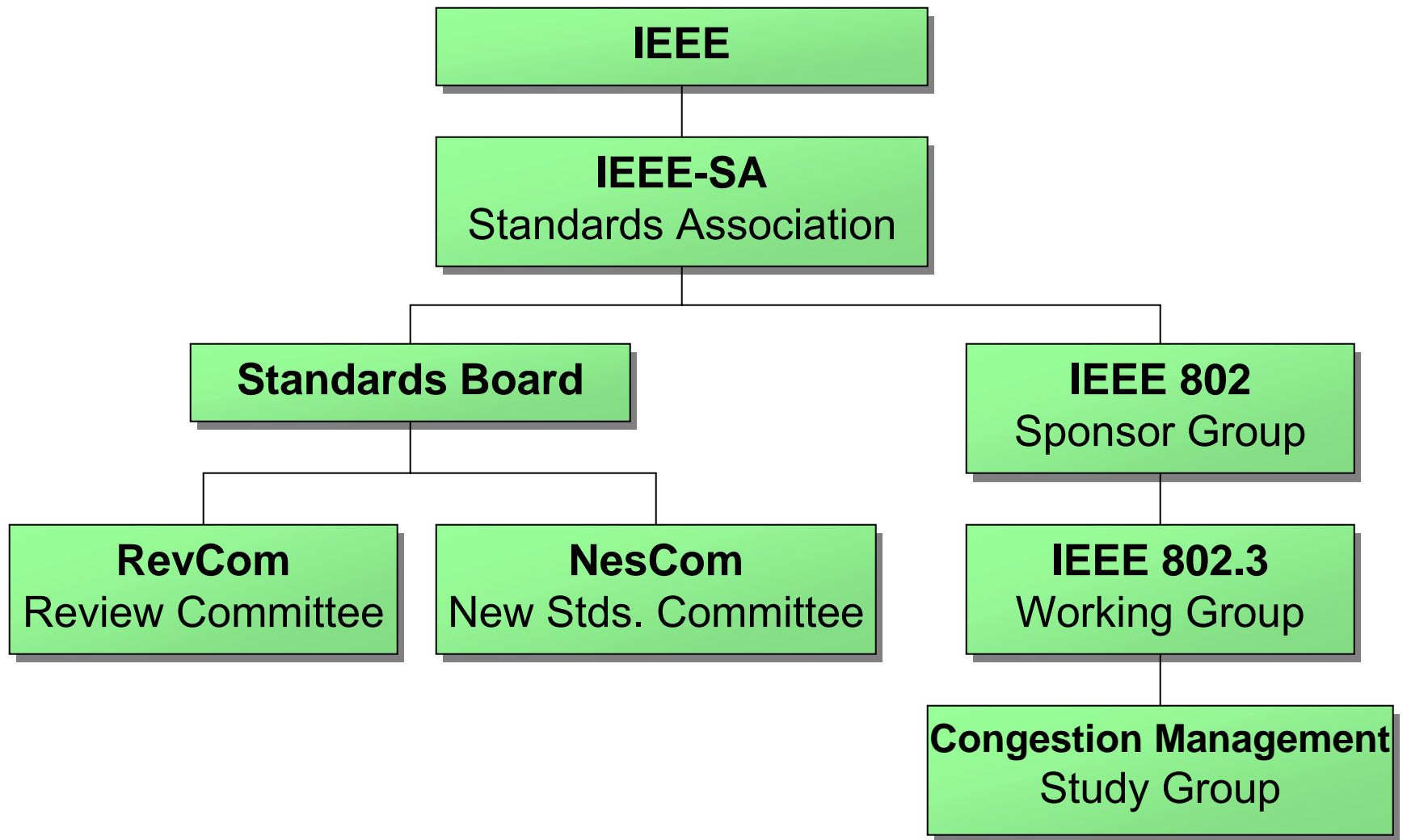
http://www.ieee802.org/3/cm_study/



Ground Rules

- 802.3 Rules apply
 - 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

- Bylaws of the IEEE Standards Association (IEEE-SA):
<http://standards.ieee.org/sa/sa-bylaws.pdf>
- Bylaws of the IEEE-SA Standards Board:
<http://standards.ieee.org/guides/bylaws/sb-bylaws.pdf>
- IEEE LAN/MAN Standards Committee (LMSC)
Operating Rules:
<http://www.ieee802.org/rules.pdf>
- IEEE 802.3 Working Group Operating Rules:
<http://www.ieee802.org/3/rules/>



IEEE-SA Standards Board Bylaws on Patents in Standards

6. Patents

IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard. This assurance shall be provided without coercion and prior to approval of the standard (or reaffirmation when a patent becomes known after initial approval of the standard). This assurance shall be a letter that is in the form of 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 the proposed IEEE standard against any person or entity using the patent(s) to comply with the standard or
- b) A statement that a license 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 shall apply, at a minimum, from the date of the standard's approval to the date of the standard's withdrawal and is irrevocable during that period.

Approved by IEEE-SA Standards Board – December 2002



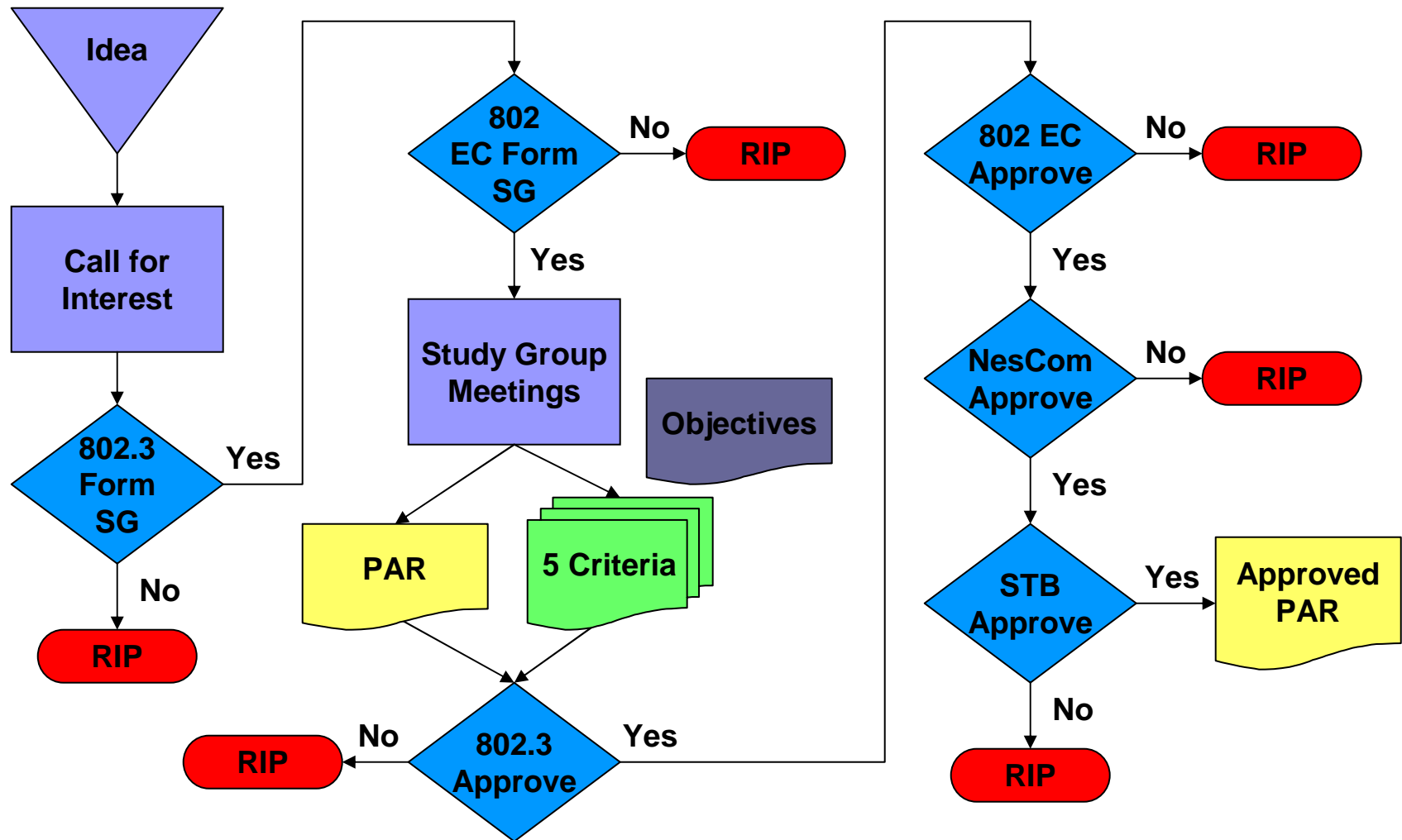
Inappropriate Topics for IEEE SG Meetings

- 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.

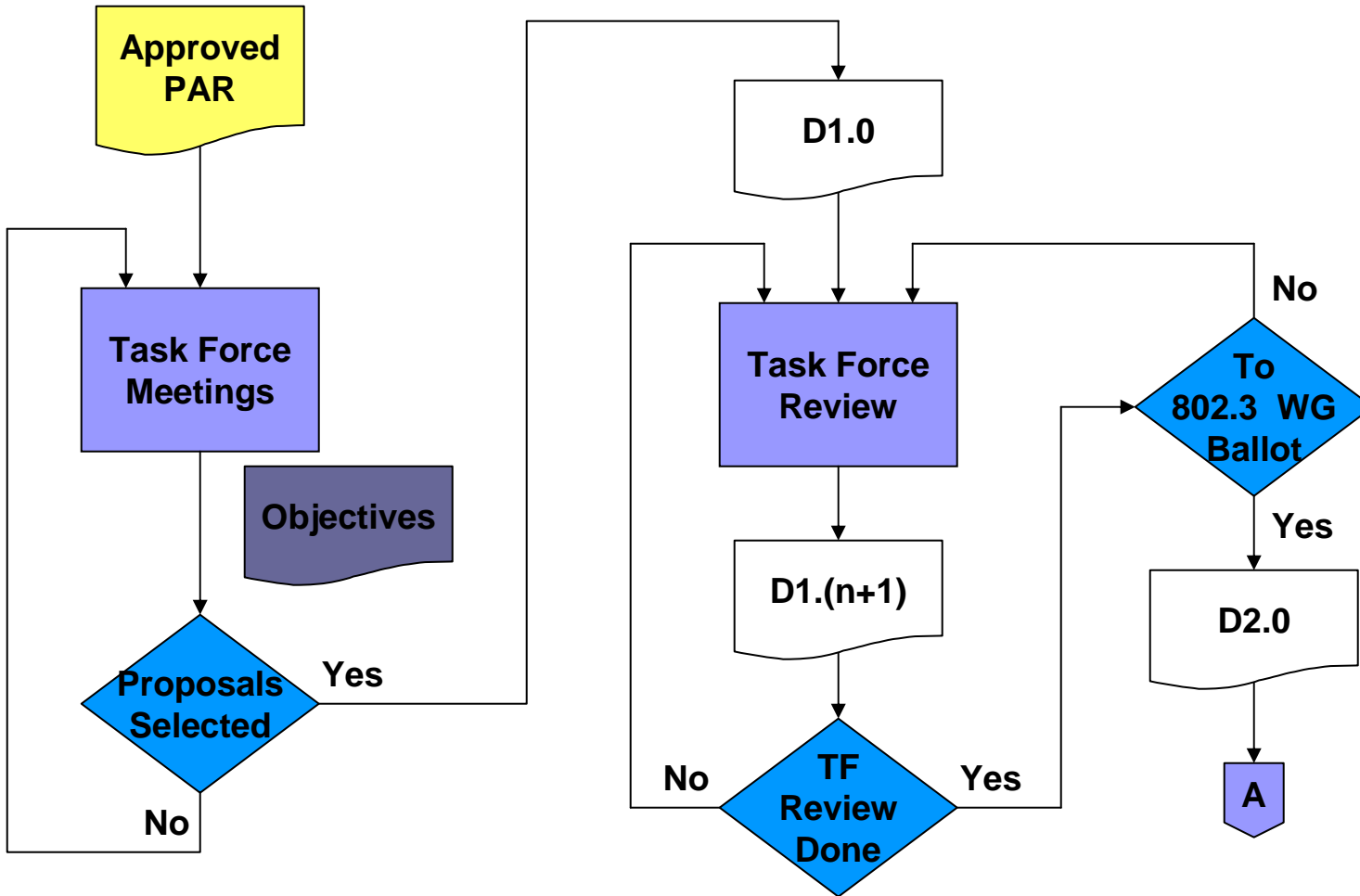
If you have questions, contact the IEEE Patent Committee Administrator at patcom@ieee.org

Approved by IEEE-SA Standards Board – December 2002

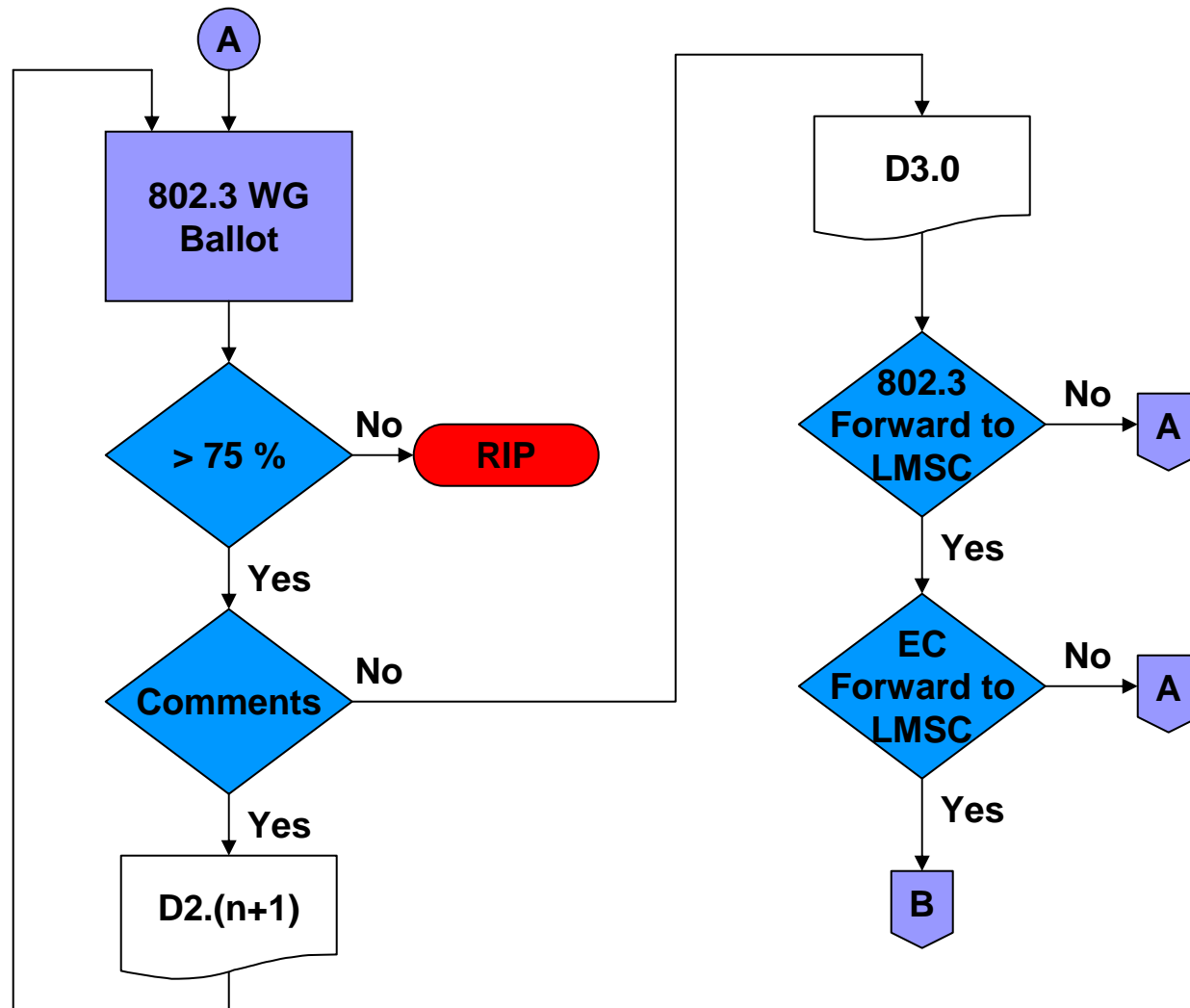
IEEE Standards Process



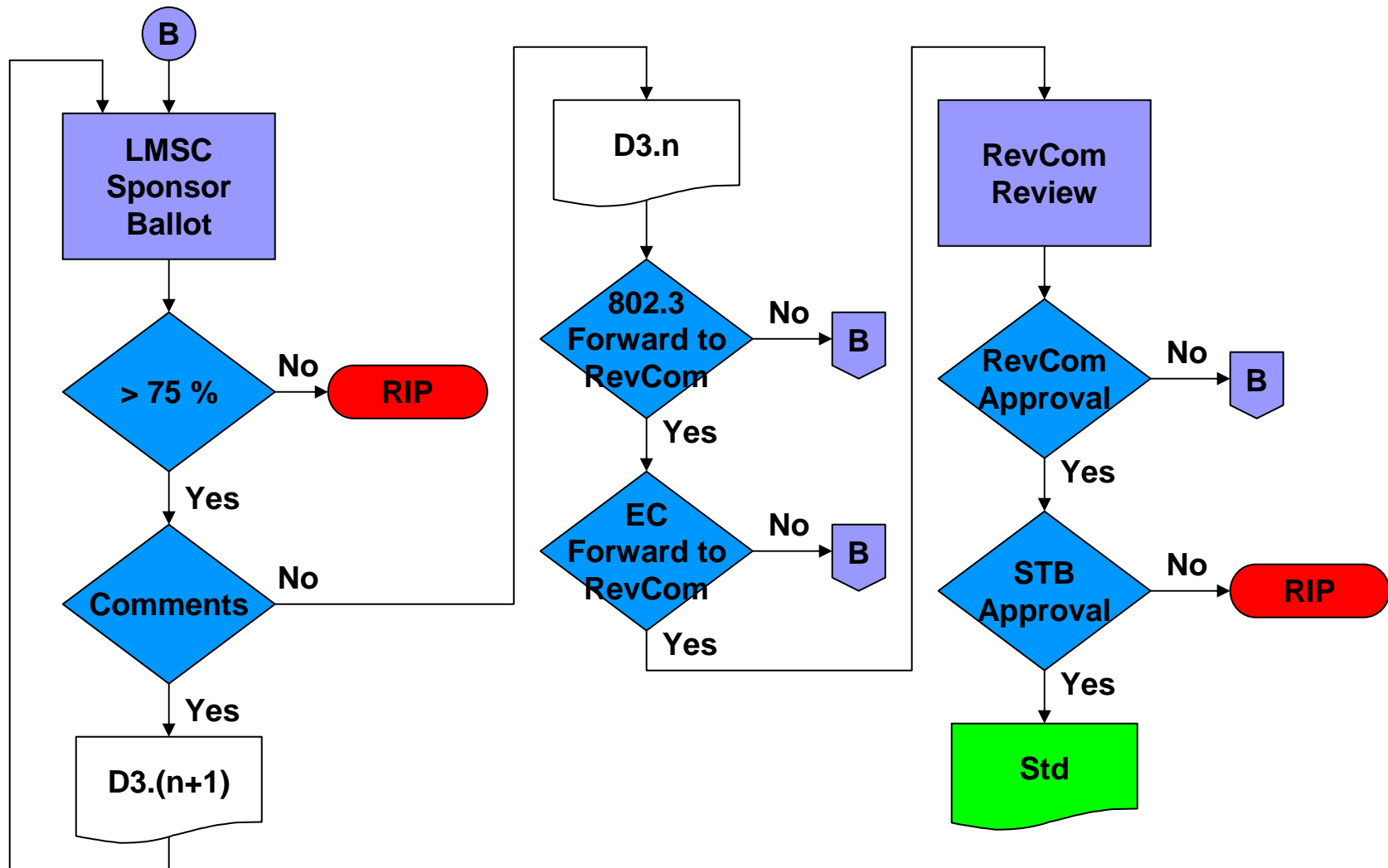
IEEE Standards Process (cont.)



IEEE Standards Process (cont.)



IEEE Standards Process (cont.)





Study Group

- Function is to draft a PAR and 5 Criteria
- Gain approval at WG 802.3, 802 EC, IEEE NesCom and IEEE Stds. Board
- SG only exists for 6 months
 - Extensions can be requested... voted on by 802.3, ratified by EC
- Development of Objectives helps set the goals for the Task Force
- Developing consensus
 - Education helps build consensus
 - Consensus (> 75%) required to move forward



Objectives

- Specify a mechanism to support the communication of congestion information
- Specify a mechanism to limit the rate of transmitted data on an Ethernet link
- Preserve the MAC/PLS service interfaces
- Minimize throughput reduction in non-congested flows



PAR Title

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: Enhancements for Congestion Management



PAR Scope

To specify IEEE 802.3 MAC parameters and minimal augmentation of MAC operation and management parameters of IEEE Std 802.3 to provide rate control and support of IEEE 802 congestion management.



PAR Purpose (14)

This project will enable accelerated deployment of Ethernet into emerging limited-topology applications that require improved delay, delay variation and frame loss characteristics.



PAR Purpose (14a)

Ethernet networks are being used in an increasing number of application spaces (clustering, backplanes, storage, data centers, etc.) that are sensitive to frame delay, delay variation and loss.

Study Group presentations have shown that Ethernet networks can experience higher throughput, lower delay, and lower frame loss by performing congestion management. This will improve Ethernet in its growing number of applications.



Broad Market Potential

Broad set(s) of applications

Multiple vendors, multiple users

Balanced cost (LAN vs. attached stations)

- **Ethernet networks are being used in an increasing number of application spaces (clustering, backplanes, storage, data centers, etc.) that are sensitive to frame delay, delay variation and loss. Study Group presentations have shown that Ethernet networks can experience higher throughput, lower delay, and lower frame loss by performing congestion management. This will improve Ethernet in its growing number of applications.**
- **During the discussion of the WG 802.3 motion to initiate this study group, 23 people from 16 companies indicated that they plan to participate in the standardization effort for congestion management. This level of commitment indicates that a standard will be developed by a large group of vendors and users. During the study group meetings, there have been up to 30 people from at least 16 companies in attendance.**
- **A standard to support congestion management will respect the balance of cost between LAN and attached stations.**



Compatibility with IEEE Std 802.3

Conformance with CSMA/CD MAC, PLS

Conformance with 802.2

Conformance with 802

- The proposed standard will conform to the 802.3 MAC, and therefore will be consistent with 802.1d, 802.1Q, and relevant portions of 802.1f.
- As was the case in previous 802.3 standards, additional MAC Control sublayer functionality and MAC Control frame opcodes may be defined.
- The proposed standard will conform to the 802.3 MAC Client Interface, which supports 802.2 LLC.
- The proposed standard will conform to the 802.1 Architecture, Management and Internetworking.
- The proposed standard will define a set of systems management objects, which are compatible with OSI and SNMP system management standards.
- The proposed standard will conform to the requirements of IEEE Std 802-2001.



Distinct Identity

Substantially different from other 802 & 802.3 specs

One unique solution for problem

Easy for document reader to select relevant spec

- **The current 802.3 standard specifies a means of flow control using PAUSE. While this can decrease the frame loss due to oversubscription, the periods of no data transmission result in increased delay in the Ethernet link. The use of PAUSE as back pressure can result in congestion spreading and therefore it is rarely used.**
- **Congestion management, when used, may reduce the offered load at the congestion points without spreading congestion. This specification will define a means of decreasing frame loss while permitting increased efficiency in the Ethernet network.**
- **The specification will be done in a format consistent with the IEEE document requirements thus making it easy for implementers to understand and to design.**



Technical Feasibility

Demonstrated system feasibility
Proven technology, reasonable testing
Confidence in reliability

- **Mechanisms for congestion management using congestion indication are known in the industry for some protocols and standards. Simulations of similar protocols show there are alternatives that can be feasibly implemented to accomplish the objectives within IEEE 802.**
- **The inclusion of congestion indication in layer 2 devices was anticipated in RFC 3168 “The Addition of Explicit Congestion Notification (ECN) to IP”.**
- **Rate control is commonly implemented in Ethernet devices.**



Economic Feasibility

Cost factors known, reliable data
Reasonable cost for performance
Total installation costs considered

- **Possible solutions investigated for technical feasibility do not add significant complexity to Ethernet devices.**
- **Congestion management standardization will increase the broad market potential of Ethernet which will increase deployment and further reduce cost.**
- **System design, installation and maintenance costs are minimized by utilizing Ethernet system architecture, management, and software.**

Presentations

Tuesday November 16, 2004				
Presenter	Topic	Length	Start	Finish
Brown, Ben	Welcome, introductions & agenda	0:30	8:30 AM	9:00 AM
Seaman, Mick	802.1 joint discussion	1:30	9:00 AM	10:30 AM
Group	How to apply 802.1 discussion points	1:30	10:30 AM	12:00 PM
Lunch		1:00	12:00 PM	1:00 PM
No meeting	Frame Expansion	4:00	1:00 PM	5:00 PM
Wednesday November 17, 2004				
Presenter	Topic	Length	Start	Finish
Group	Welcome	0:15	8:30 AM	8:45 AM
Hamano, Takafumi	Requirements of congestion management for backplane ethernet	0:10	8:45 AM	8:55 AM
Brunner, Bob	Perspective on telco equipment based on an ethernet backplane	0:45	8:55 AM	9:40 AM
Morning Break		0:20	9:40 AM	10:00 AM
James, David	P1796 Resilient Backplane Rings congestion management update	0:30	10:00 AM	10:30 AM
Gupta, Tanmay	Simulations for incremental deployment of L2-Cl	0:45	10:30 AM	11:15 AM
Group	Discussion of presentations & tutorial - are we missing any objectives? Do we need changes to PAR and critters?	0:45	11:15 AM	12:00 PM
Lunch		1:30	12:00 PM	1:30 PM
Group	Continued discussions	1:15	1:30 PM	2:45 PM
Afternoon Break		0:15	2:45 PM	3:00 PM
Group	Discussion of task force schedule	2:00	3:00 PM	5:00 PM



Motion to modify PAR Scope

- Change first instance of “MAC” to “Media Access Control (MAC)”
- Change answer to question to Yes
- This PAR includes work on independent capabilities, and some of the work is not contingent on another project. This PAR is being launched to match the anticipated completion of work to be done within 802.1. The complete capabilities and benefits envisioned in Ethernet networks through Congestion Management capabilities will include both 802.3 and 802.1 work. Serialization of the projects would unnecessarily delay market introduction of the capabilities. If 802.1 work is not completed for the cooperative efforts or the progress would unnecessarily delay either the non-dependent or dependent capabilities also included in this PAR, the work will be split into two PARs.
- M: Hugh Barrass
- S: Larry Rubin
- All Y: 13 N: 0 A: 0



802.3 CMSG motion to approve & forward

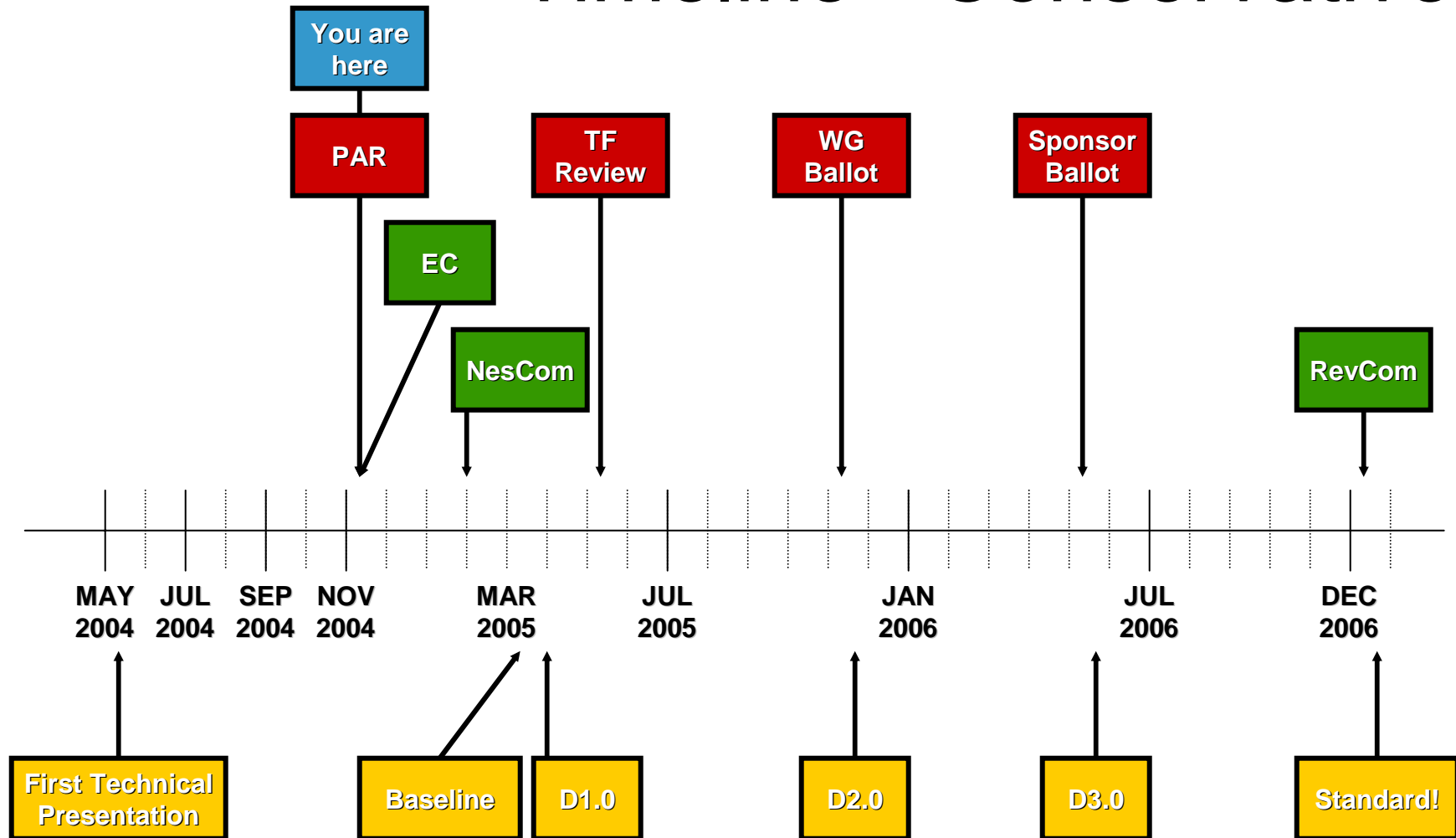
- Move that the congestion management study group request 802.3 approve the congestion management objectives, per objectives_0904.pdf, individually approve the congestion management 5 criteria per critters_0904.pdf, and forward the congestion management criteria to the 802 SEC for approval, and approve the congestion management PAR, per par_0904.pdf and as modified in response to 802.1 and 802.17 comments, and forward the PAR to the 802 SEC and NesCom for approval (please consider for approval under continuous process)
- M: Larry Rubin
- S: Hugh Barrass
- All : Y: 10 N: 0 A: 1
- Technical: (≥75%) Passes/Fails



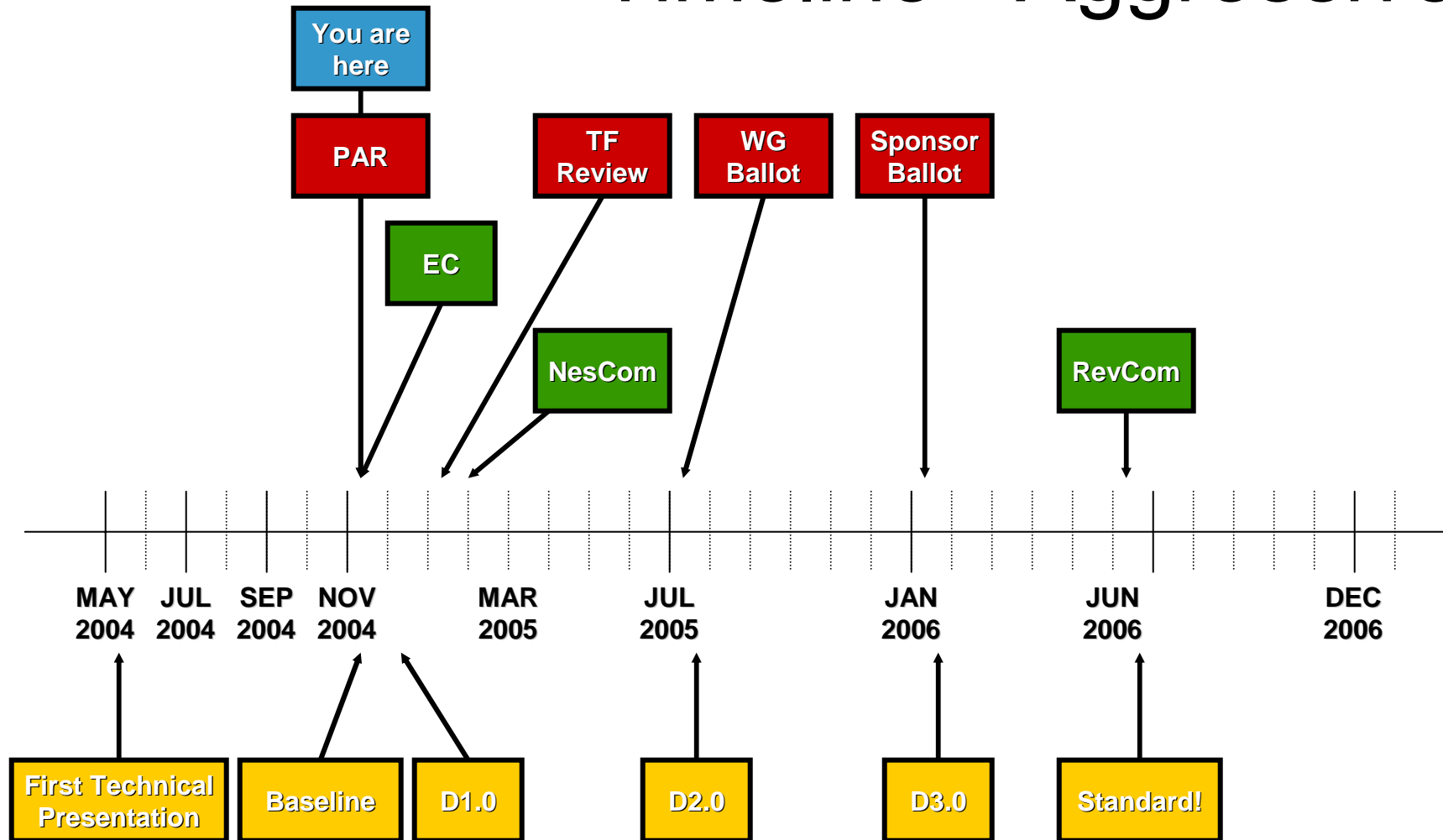
802.3 CMSG motion extension

- Move that the congestion management study group request 802.3 extend the congestion management study group
- M: Larry Rubin
- S: Manoj Wadekar
- All: Y: 11 N: 0 A: 0
- Technical: ($\geq 75\%$) Passes/Fails

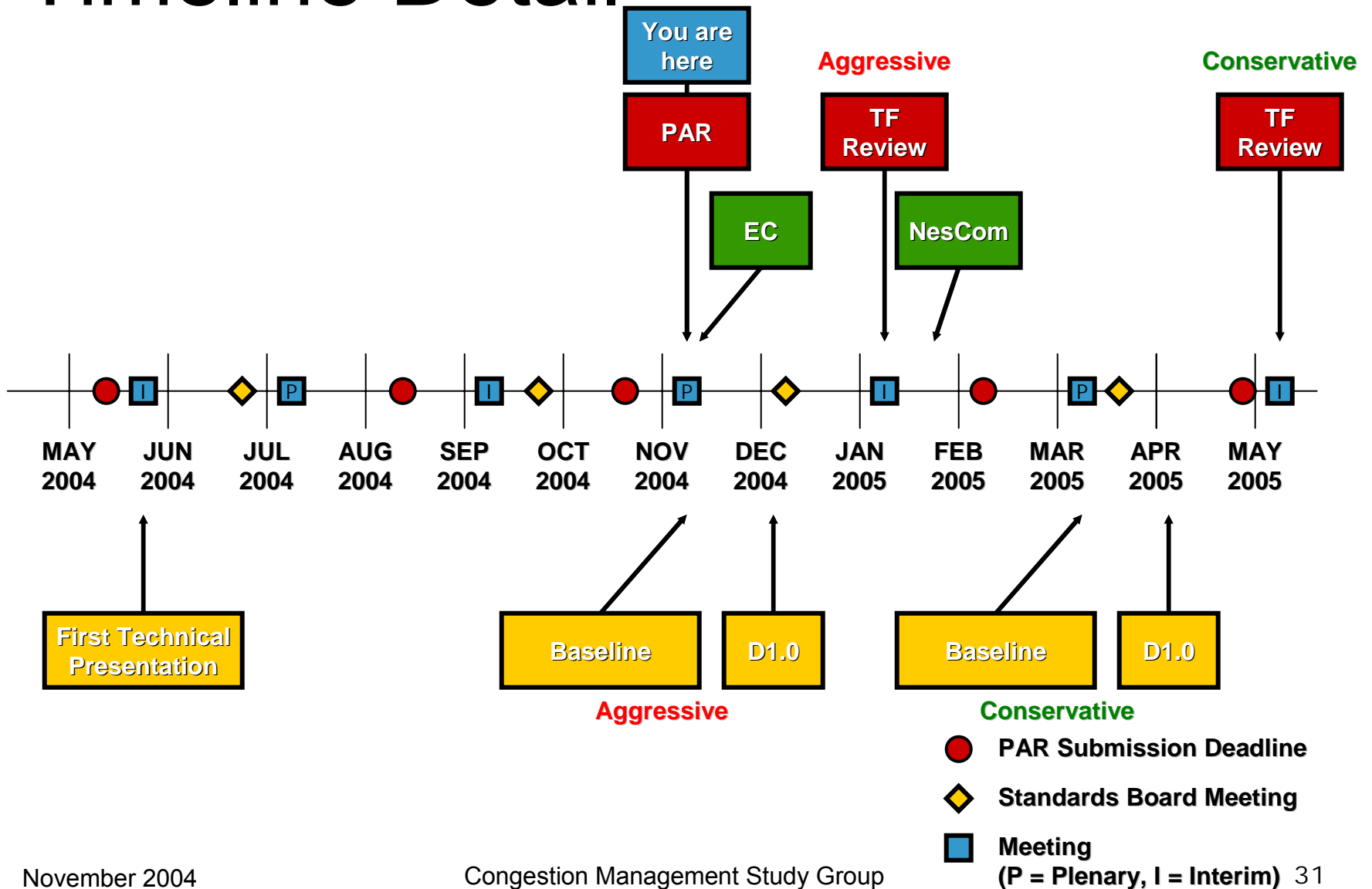
Possible Congestion Management Timeline - Conservative



Possible Congestion Management Timeline - Aggressive



Timeline Detail





Future Meetings

- January 2005 Interim:
 - Sacramento
- How many plan to attend the CMSG?
 - 7
- Mar 2005 Plenary
 - Week of the 13th
 - Atlanta, GA
 - Hyatt Regency



Adjourn

Thank you!