

The background features a stylized illustration of network equipment. On the left, there is a light blue rack-mounted device with two circular ports. In the center, a red rack-mounted device with two circular ports is shown. To its right is a blue laptop. On the far right, another red rack-mounted device with two circular ports is visible. The text is overlaid on this illustration.

**IEEE 802.3**  
**10GBASE-T Study Group**  
**Agenda and General Information**

**Albuquerque, NM**  
**November 11, 2003**

**Brad Booth, Chair**

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# Put Cell Phones on Stun!!



# Agenda

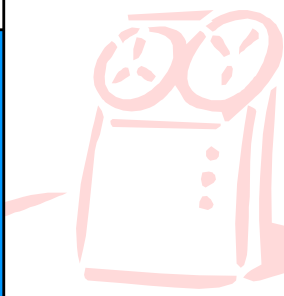
- Welcome and Introductions
- Recording Secretary: Jeff Warren
- Approval of the Minutes (September '03)
- Goals for this Meeting
- Reflector and Web
- Ground Rules
- IEEE
  - Structure
  - Bylaws and Rules
  - Call for Patents
  - IEEE Standards Process
- Liaison Letters
- Presentations
- Future Meetings
- Motion Madness

# Goals for this Meeting

- **Raison d'être**
  - To get our PAR, 5 Criteria and Objectives passed
    - Make minor modifications for clarification
    - Ensure strong support for proceeding
- **Hear presentations concerning:**
  - Technical proposals for developing a baseline
  - Data Center considerations



# Meeting Map

	MON	TUE	WED	THU	FRI		
08:00	SEC		Time Off				
08:30		10GBT Opening		10GBT Closing & Motion Madness			
09:00							
09:30							
10:00							
10:30	Break	10GBT Presentations					
11:00	802 Plenary						
11:30							
12:00	Lunch	Lunch				Lunch	
12:30							
13:00	802.3 Plenary	10GBT Presentations	Time Off	802.3 Plenary	SEC		
14:00							
14:30							
15:00							
15:30							
16:00							
16:30							
17:00							
17:30		Dinner					
18:00	Dinner						
18:30	10GBT Tutorial	10GbE on MMF CFI	Social				
19:30		Backplane CFI					
20:00	EMS Tutorial	2.5G CFI					
20:30							
21:30							

# Reflector and Web

- To subscribe to any of the 10GBASE-T reflectors send an email to:

*[majordomo@ieee.org](mailto:majordomo@ieee.org)*

with the following in the body of the message:

*[subscribe stds-802-3-10GBT <your email address>](#)*

*[subscribe stds-802-3-10GBT-Modeling <your email address>](#)*

*[subscribe stds-802-3-10GBT-Cabling <your email address>](#)*

- 10GBASE-T Study Group web page URL:

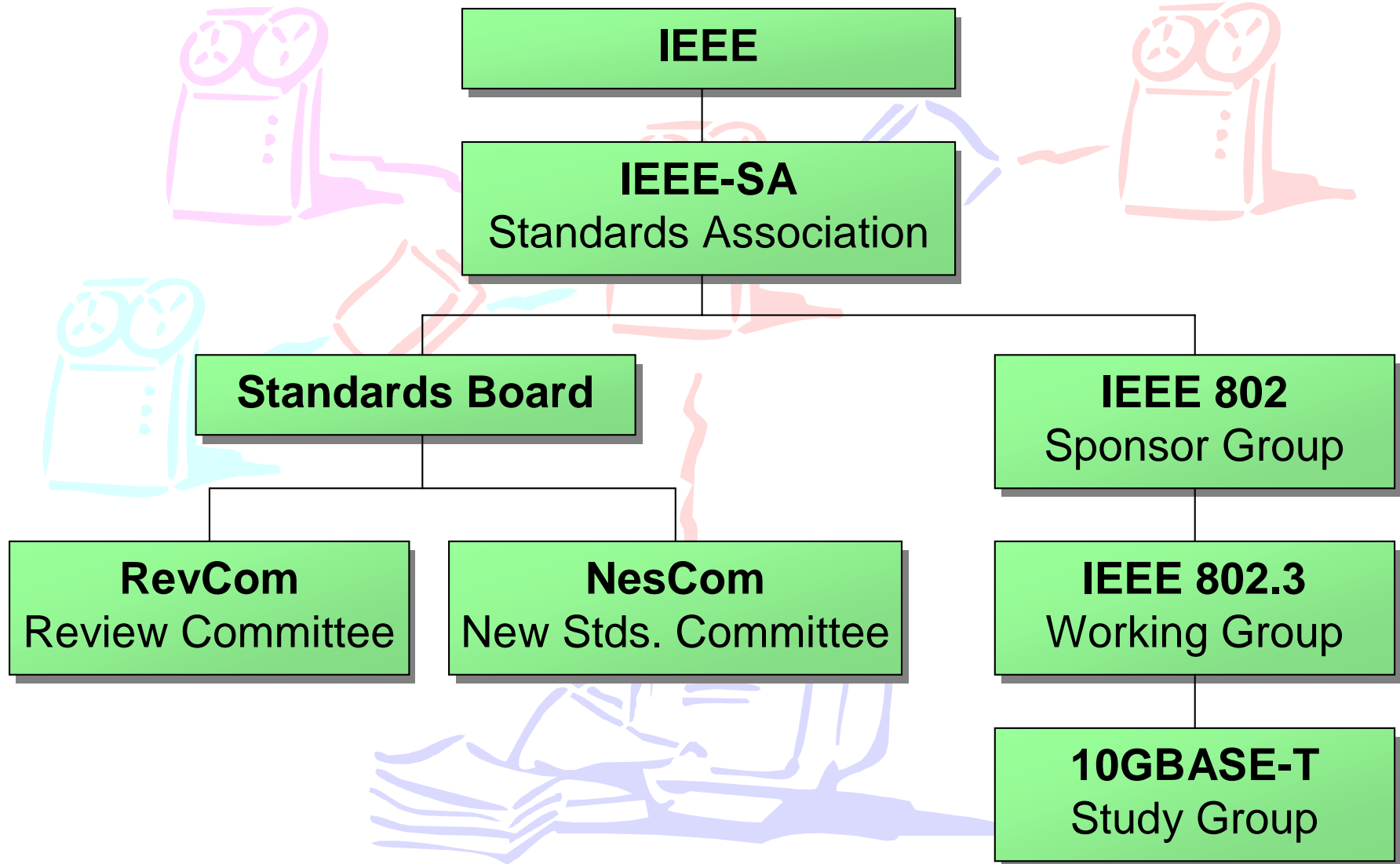
*<http://www.ieee802.org/3/10GBT/>*



# 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

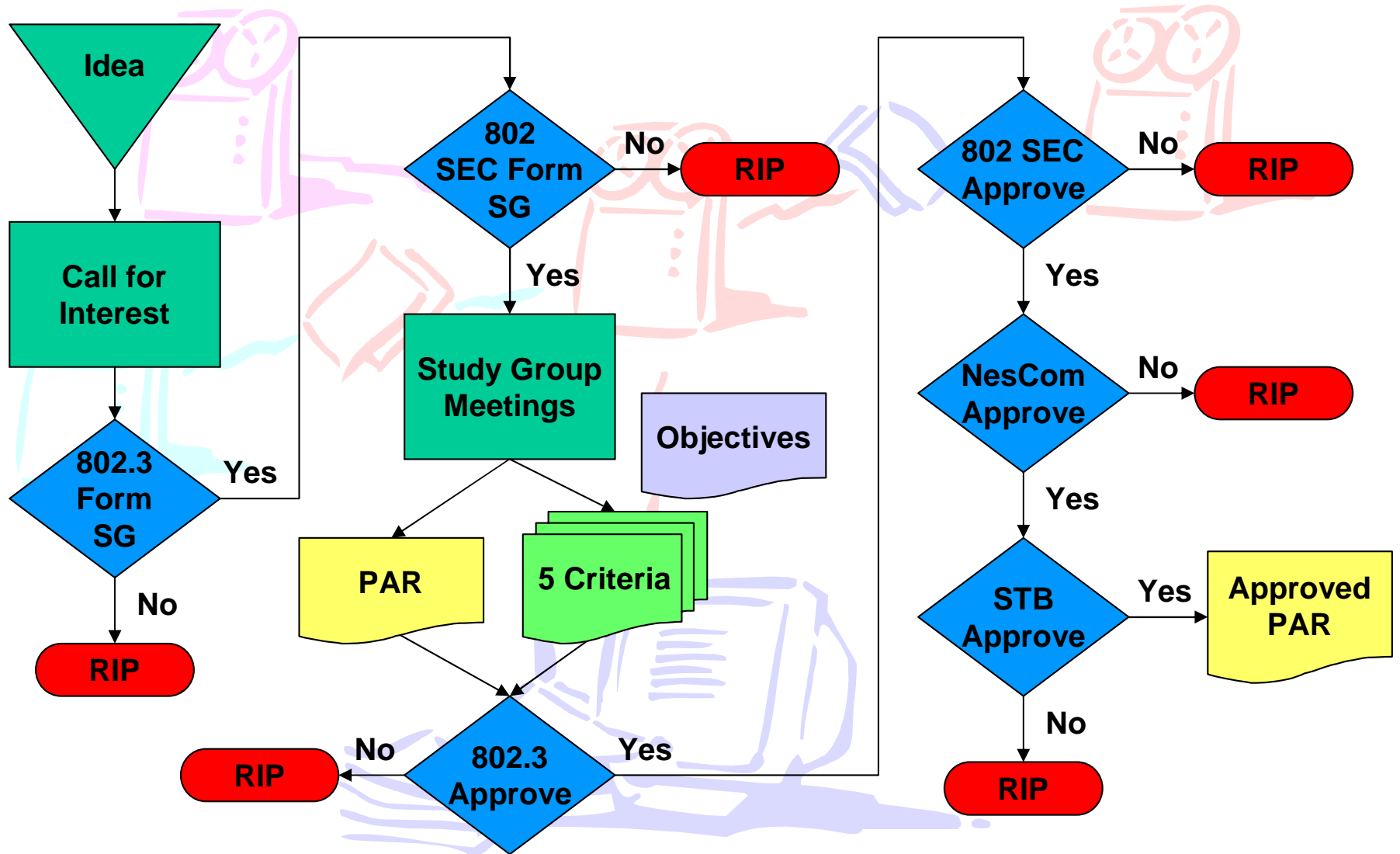
# Inappropriate Topics for IEEE WG Meetings

- 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.

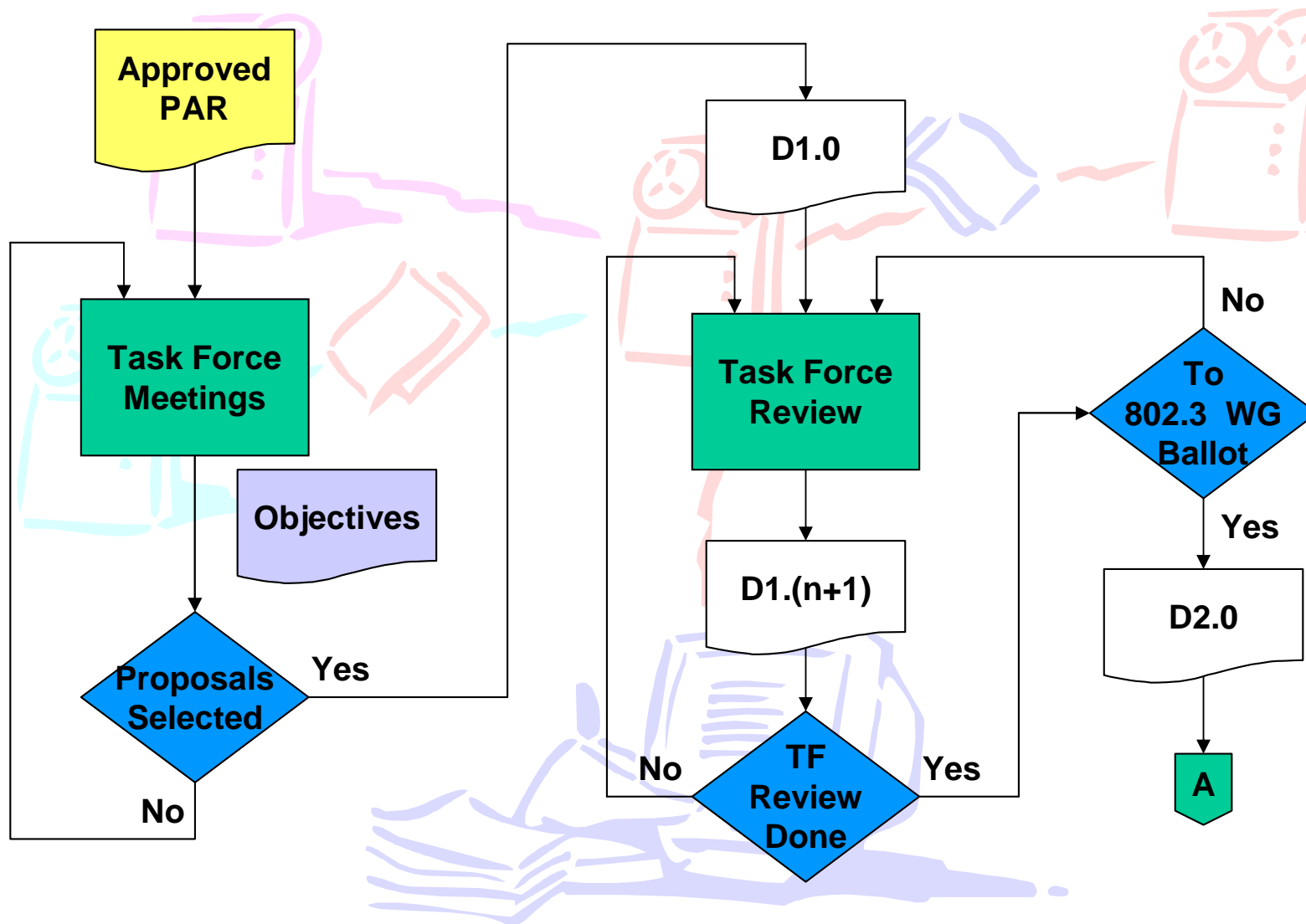
**If you have questions,  
contact the IEEE Patent Committee Administrator  
at [patcom@ieee.org](mailto:patcom@ieee.org)**

Approved by IEEE-SA Standards Board – December 2002

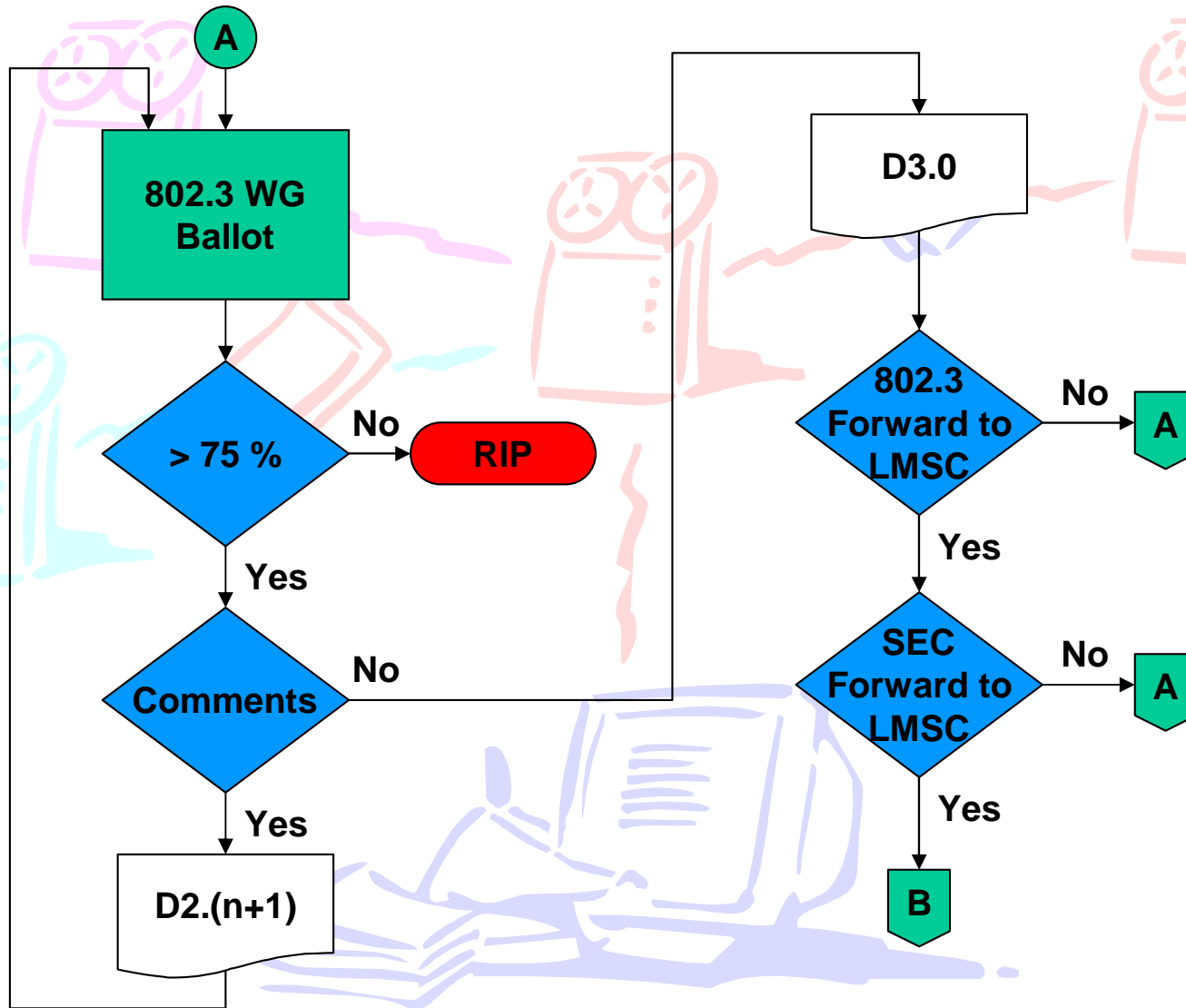
# IEEE Standards Process



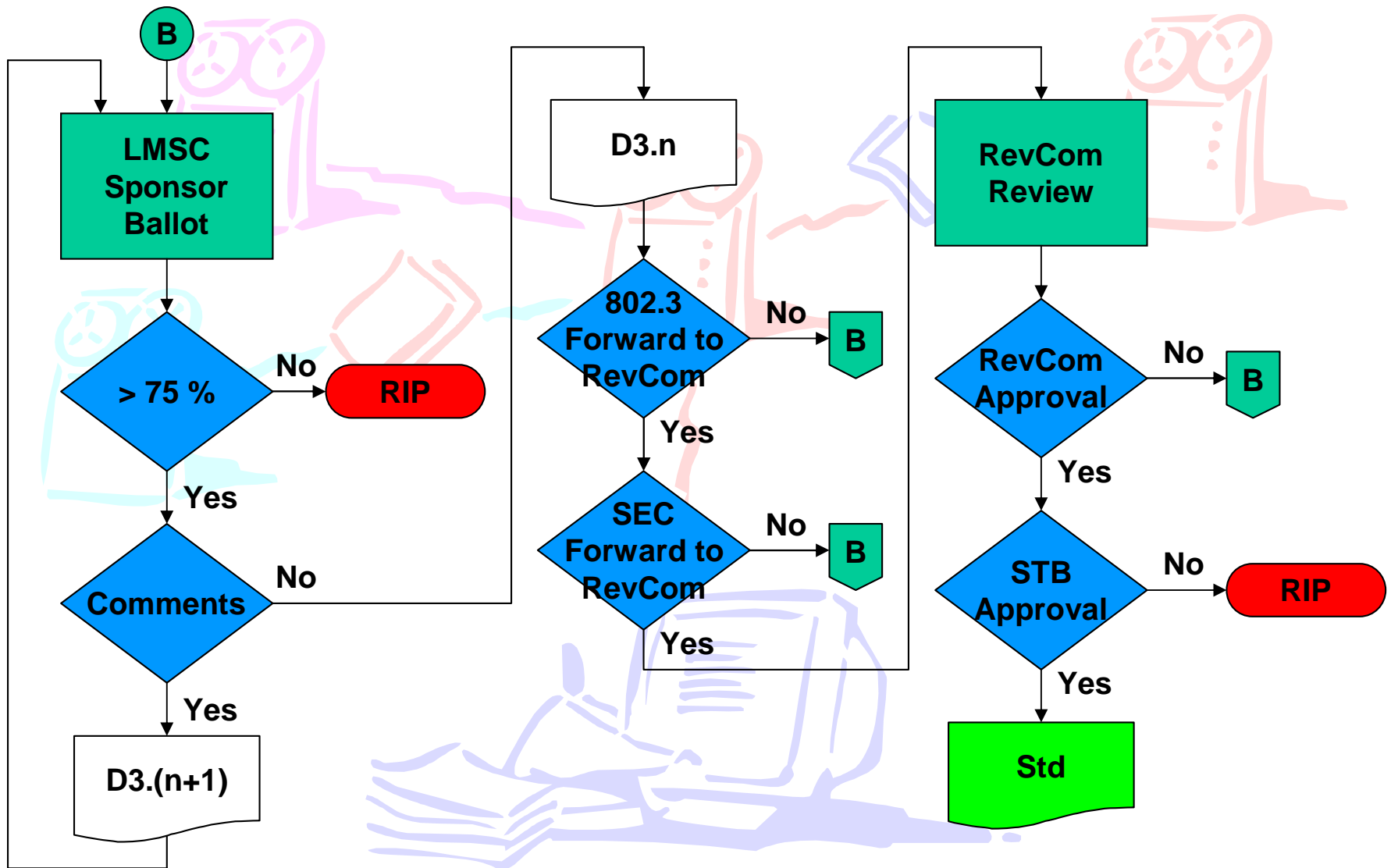
# IEEE Standards Process (cont.)



# IEEE Standards Process (cont.)



# IEEE Standards Process (cont.)



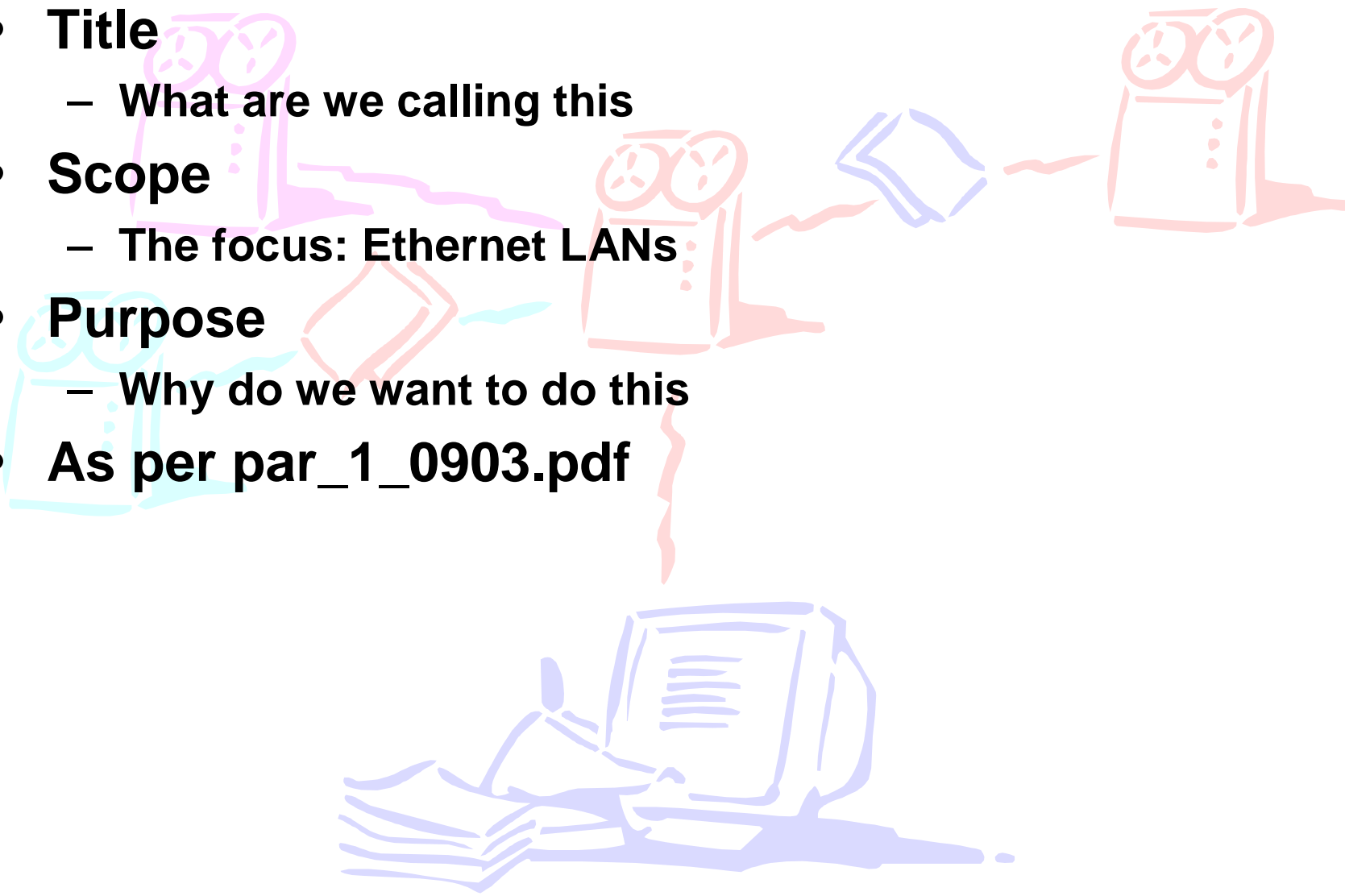
# Study Group

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



# PAR

- **Title**
  - What are we calling this
- **Scope**
  - The focus: **Ethernet LANs**
- **Purpose**
  - Why do we want to do this
- **As per par\_1\_0903.pdf**



# 5 Criteria

- **Broad Market Potential**
  - Broad set(s) of applications
  - Multiple vendors, multiple users
  - Balanced cost (LAN vs. attached stations)
- **Compatibility with IEEE Std. 802.3**
  - Conformance with CSMA/CD MAC, PLS
  - Conformance with 802.2
  - Conformance with 802 Functional Requirements
- **Distinct Identity**
  - Substantially different from other 802.3 specifications
  - One unique solution for problem
  - Easy for document reader to select relevant spec

# 5 Criteria (cont.)

- **Technical Feasibility**
  - Demonstrated system feasibility
  - Proven technology, reasonable testing
  - Confidence in reliability
- **Economic Feasibility**
  - Cost factors known, reliable data
  - Reasonable cost for performance
  - Total installation costs considered
- **As per 5Criteria\_1\_0903.pdf**



# Objectives

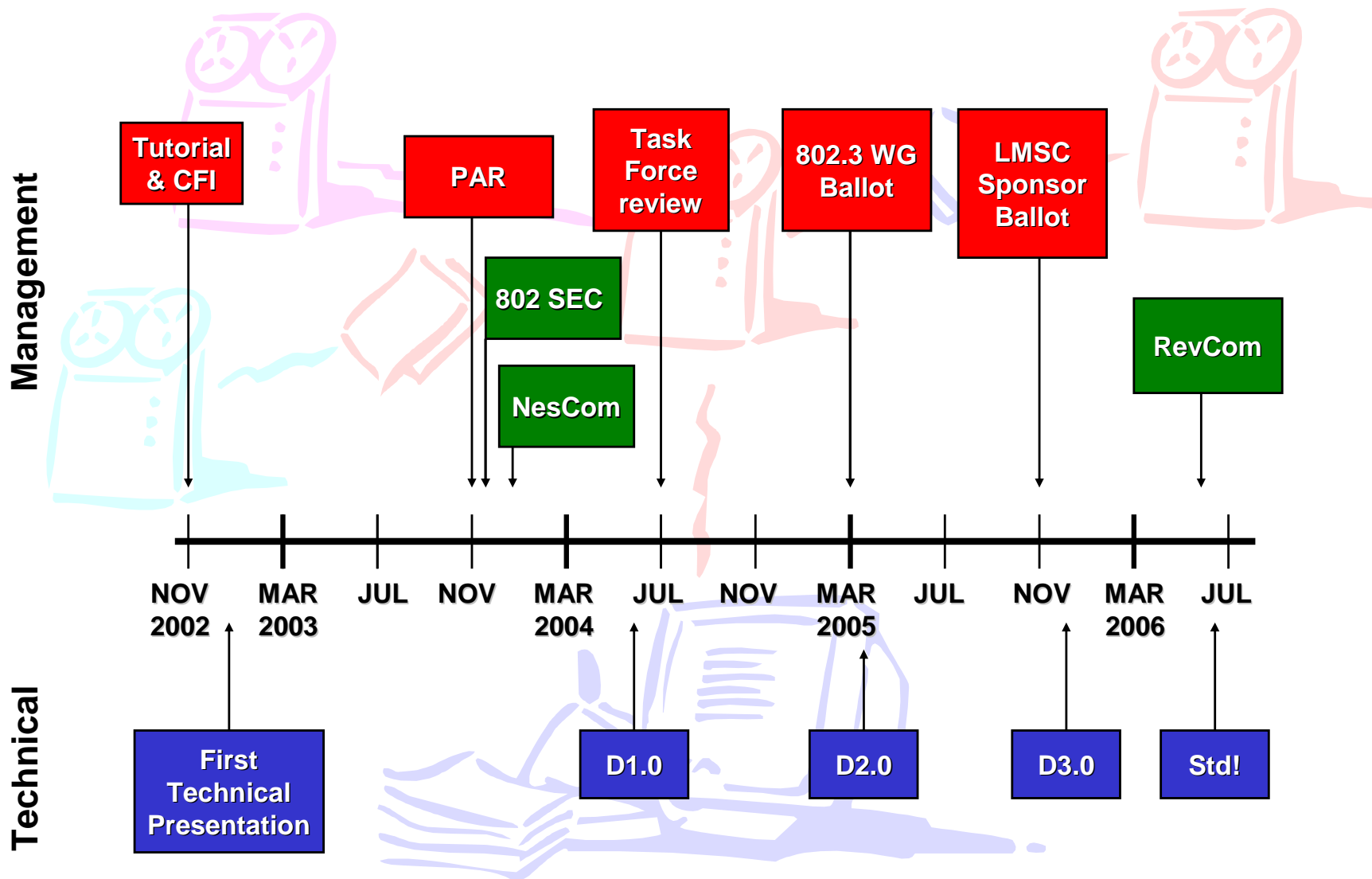
- **Preserve the 802.3/Ethernet frame format at the MAC Client service interface**
- **Preserve min. and max. frame size of current 802.3 Std.**
- **Support full duplex operation only**
- **Support star-wired local area networks using point-to-point links and structured cabling topologies**
- **Support a speed of 10.000 Gb/s at the MAC/PLS service interface**
- **Select copper media from ISO/IEC 11801:2002, with any appropriate augmentation to be developed through work of 802.3 in conjunction with SC25/WG3**
- **Support Clause 28 auto-negotiation**
- **Support coexistence with 802.3af**
- **To not support 802.3ah (EFM) OAM unidirectional operation**
- **Meet CISPR/FCC Class A**

# Objectives (cont.)

- Support operation over 4-connector structured 4-pair, twisted-pair copper cabling for all supported distances and Classes
- Define a single 10 Gb/s PHY that would support links of:
  - At least 100 m on four-pair Class F balanced copper cabling
  - At least 55 m to 100 m on four-pair Class E balanced copper cabling
- Support a BER of  $10^{-12}$  on all supported distances and Classes



# 10GBASE-T Timeline



# Liaison Letter & Ad Hoc Reports

- Liaison letter received from ISO/IEC JTC 1 / SG 25 / WG 3
- Liaison letter received from TIA TR42
- Ad hoc reports
  - None

# Presentations

- **Mike Bennett; “10GBASE-T: Broad Market Potential in Data Centers”**
- **Chris Di Minico; “Data Center Design Considerations”**
- **Bernie Hammond; “Feasibility of Augmented Category 6 UTP Cabling Supporting 100m 10GBase-T Channels”**
- **Ron Nordin, Paul Vanderlaan; “Alien Crosstalk Mitigation Technique Update”**
- **Mohsen Kavehrad; “Transmission Strategies for 10GBase-T over 100m of Cat-5e / 6 Copper Wiring”**
- **Sailesh Rao, “A 4D-PAM8 Proposal for 10GBASE-T”**
- **Brad Booth, “Comments on PAR, 5 Criteria and Objectives”**



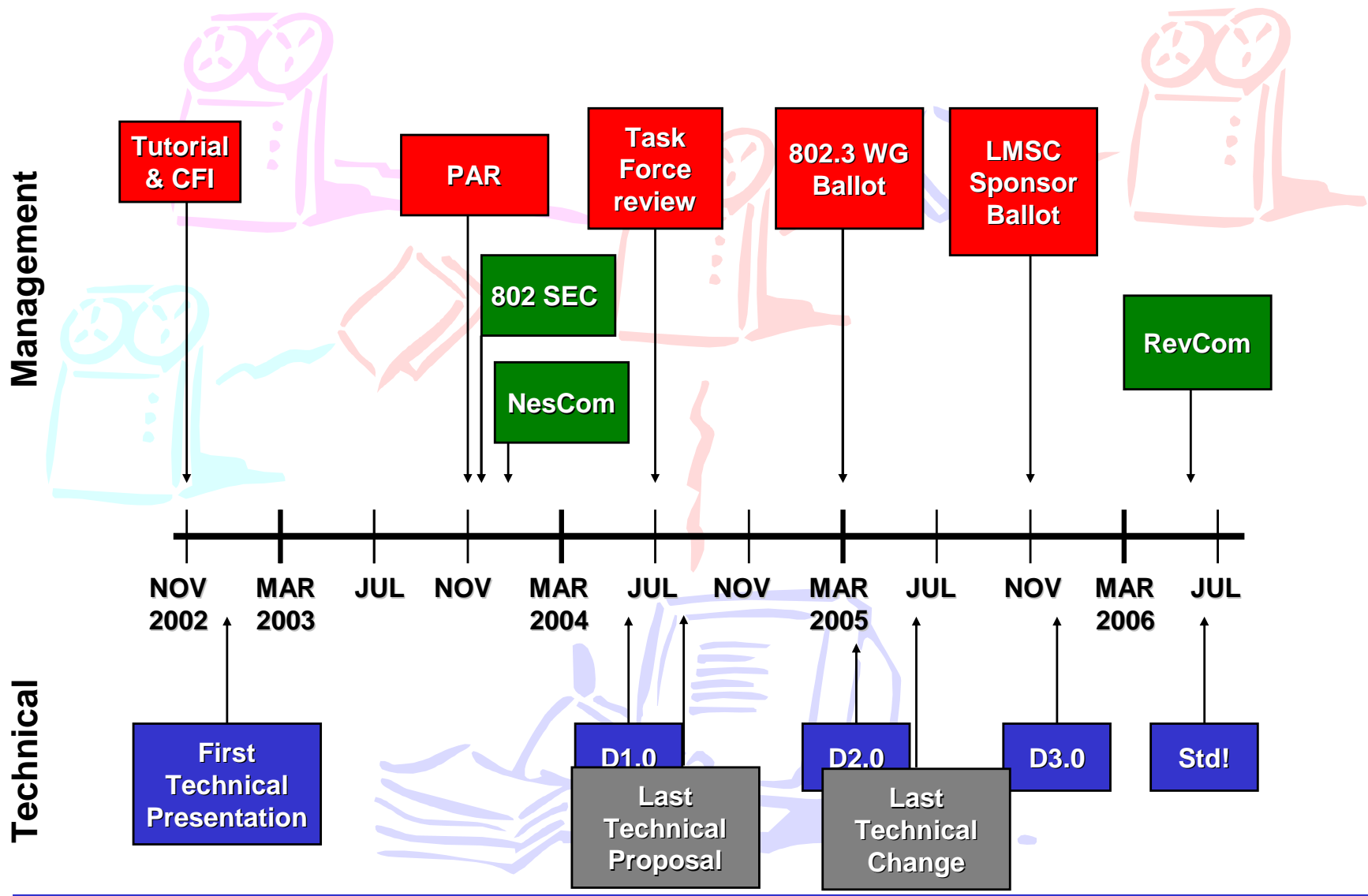


# Future Meetings

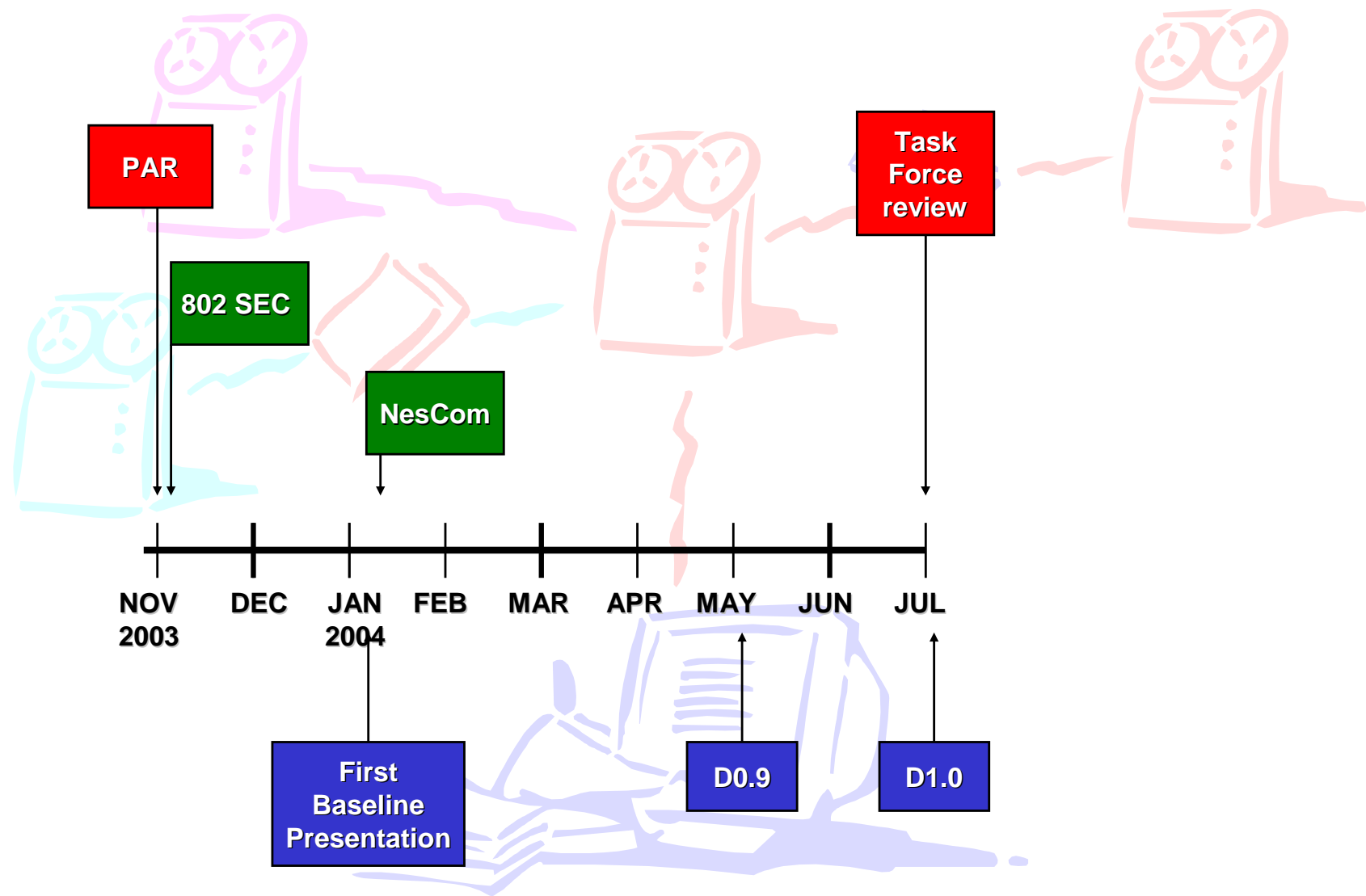
- **January 2004 Interim:**
  - Week of the 12<sup>th</sup>
  - Vancouver, BC
  - Hosted by IEEE 802
  - Fairmont Hotel Vancouver
- **March 2004 Plenary:**
  - Week of the 15<sup>th</sup>
  - Orlando, FL
  - Hilton Hotel @ Walt Disney World



# 10GBASE-T Timeline



# Next 6 Months



# Motion Madness



# Motion #1: PAR Scope

- Move that the Study Group approve Geoff Thompson's 10GBASE-T PAR feedback w.r.t. clarification of Scope.
  - *“Specify a Physical Layer (PHY) for operation at 10 Gb/s on standards based structured copper cabling, using the existing Media Access Controller, and with extensions to the appropriate physical layer management parameters, of IEEE Std 802.3.”*
  - Reference PAR Document:
    - [http://www.ieee802.org/3/10GBT/public/sep03/par\\_1\\_0903.pdf](http://www.ieee802.org/3/10GBT/public/sep03/par_1_0903.pdf)

- M: J. Warren
- S: A. Flatman
- Technical (>75%)
- SG Voters: Y: 48 N: 0 A: 1
- 802.3 Voters: Y: 23 N: 0 A: 1
- PASSES

# Motion #2: 802.1 Compatibility

- Move that the Study Group approve Tony Jeffree's 10GBASE-T 5 Criteria feedback w.r.t. Compatibility.
  - “Conformance with 802.1 and 802.2 is provided by the overlying 802.3ae MAC sub-layer”.
    - Reference 5 Criteria Document:
      - [http://www.ieee802.org/3/10GBT/public/sep03/5Criteria\\_1\\_0903.pdf](http://www.ieee802.org/3/10GBT/public/sep03/5Criteria_1_0903.pdf)

• M: J. Warren

S: G. Eisler

• Technical (>75%)

• SG Voters: Y: 45 N: 0 A: 1

• 802.3 Voters: Y: 24 N: 0 A: 0

• PASSES

# Motion #3: Broad Market Potential

- Move that the Study Group add the following text to the 10GBASE-T 5 Criteria feedback.
  - *“Exhibit similar cost balance as 802.3ab (1000BASE-T) for LAN devices vs. attached stations.”*

- M: B. Booth

- S: B. Armijo

- Technical (>75%)

- SG Voters: Y: 42 N: 1 A: 5

- 802.3 Voters: Y: 26 N: 1 A: 1

- PASSES

# Motion #4: Liaison Letters

- Move that the Study Group accept the two Liaison Response letters (TIA TR-42 & ISO/IEC 11801 JTC 1/SC 25/WG 3) drafted by the Cabling Ad Hoc and forward the letters to 802.3 for editing and approval.
- M: J. Warren                      S: R. Mei
- Procedural (>75%)
- SG Voters:                      Y: 51                      N: 0                      A: 0
- 802.3 Voters:                      Y: 27                      N: 0                      A: 0
- **PASSES**



# Motion #5: Objectives Approval

- Move that the 10GBASE-T Study Group request approval the 10GBASE-T Objectives document, per objectives\_1\_0903.pdf, by the 802.3 WG.

- M: J. Warren

- S: A. Flatman

- Technical (>75%)

- SG Voters:            Y: 56            N: 0            A: 0

- 802.3 Voters:        Y: 32            N: 0            A: 0

- **PASSES**





# Motion #7: PAR Approval

- Move that the 10GBASE-T Study Group request the 802.3 WG to approve the 10GBASE-T PAR, as per par\_1\_0903.pdf plus the modification from Motion #1 to be listed in par\_1\_1103.pdf, and request the 802.3 WG to forward the PAR to the 802 SEC and NesCom for approval.
- M: J. Warren                      S: B. Hammond
- Technical (>75%)
- SG Voters:                      Y: 54                      N: 0                      A: 0
- 802.3 Voters:                      Y: 28                      N: 0                      A: 0
- **PASSES**





# Adjourn

