IEEE P802.3ap
Backplane Ethernet Task Force
Agenda and General Information

Vancouver, BC
January 24, 2005

Agenda

- Welcome and Introductions
- Approve Agenda
- Approve Meeting Minutes
- Goals for this Meeting
- Task Force Organization
- Reflector and Web
- Ground Rules
- IEEE
  - Structure
  - Bylaws and Rules
  - Call for Patents
  - IEEE Standards Process
- Review Task Force Status
- Presentations
- Motion Madness
- Future Meetings

Goals for this Meeting

- Work toward IEEE P802.3ap Draft 1.0.

- Adopt proposals to fill holes in baseline text.

- Discuss "Big Ticket" Items:
    - Interconnect Specifications
    - 10GBASE-KR

- Resolve comments against Draft 0.7.

Task Force Organization

- **Task Force Chair**
  - Adam Healey (*ahealey@agere.com*)

- **Task Force Secretary**
  - John D'Ambrosia (*john.dambrosia@tycoelectronics.com*)

- **Chief Editor**
  - Schelto van Doorn (*schelto.vandoorn@intel.com*)

- **Channel Model Ad Hoc Chair**
  - Adam Healey (acting)

- **Signaling Ad Hoc Chair**
  - Mike Altmann (*michael.w.altmann@intel.com*)

Reflector and Web

- To subscribe to the IEEE P802.3ap Backplane Ethernet Task Force reflector send an email to:
  listserv@ieee.org

  with the following in the <u>body of the message</u> (do not include "<>"):
  subscribe stds-802-3-blade <yourfirstname> <yourlastname>

  For complete instructions on reflector usage, subscription, and unsubscription:
  http://ieee802.org/3/ap/reflector.html

- IEEE P802.3ap Task Force web page:
  http://www.ieee802.org/3/ap/

- Channel Model Ad Hoc web page:
  http://www.ieee802.org/3/ap/public/channel_adhoc

- Signaling Ad Hoc web page:
  http://www.ieee802.org/3/ap/public/signal_adhoc

IEEE P802.3ap Draft Repository

- IEEE P802.3ap Private Area:
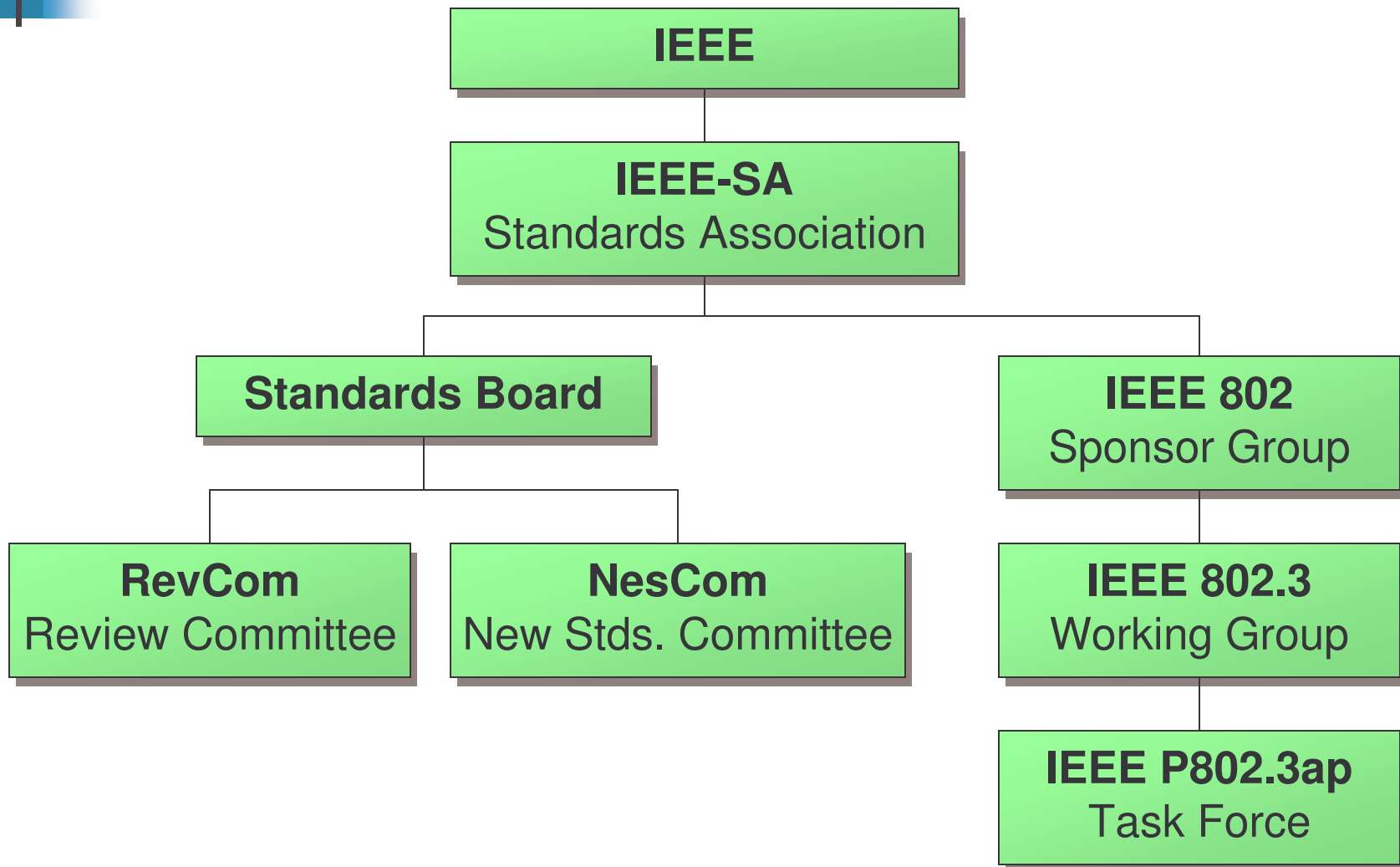 - username: **802.3ap**
  - password: ●●●●●●●

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

```
                        ┌─────────────────────┐
                        │       IEEE          │
                        └─────────────────────┘
                                  │
                        ┌─────────────────────┐
                        │      IEEE-SA        │
                        │ Standards Association│
                        └─────────────────────┘
              ┌───────────────────┴───────────────────┐
    ┌─────────────────────┐              ┌─────────────────────┐
    │   Standards Board   │              │     IEEE 802        │
    │                     │              │   Sponsor Group     │
    └─────────────────────┘              └─────────────────────┘
        ┌────────┴────────┐                        │
┌──────────────┐  ┌──────────────────┐   ┌─────────────────────┐
│   RevCom     │  │     NesCom       │   │     IEEE 802.3      │
│Review        │  │New Stds.         │   │   Working Group     │
│Committee     │  │Committee         │   └─────────────────────┘
└──────────────┘  └──────────────────┘             │
                                        ┌─────────────────────┐
                                        │   IEEE P802.3ap     │
                                        │     Task Force      │
                                        └─────────────────────┘
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Bylaws and Rules

- IEEE Standards Association (IEEE-SA):

    http://standards.ieee.org/sa

- 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 Patent Policy

- The IEEE's patent policy is consistent with the ANSI patent policy and is described in Clause 6 of the *IEEE-SA Standards Board Bylaws*

- Early disclosure of patents which may be essential for the use of standards under development is encouraged

- Disclosures made of such patents may not be exhaustive of all patents that may be essential for the use of standards under development, and that neither the IEEE, the WG, nor the WG Chairman ensure the accuracy or completeness of any disclosure or whether any disclosure is of a patent that, in fact, may be essential for the use of standards under development.

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 and prior to approval of the standard (or reaffirmation when a patent or patent application 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 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 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 – March 2003 (Revised December 2004)

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-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:
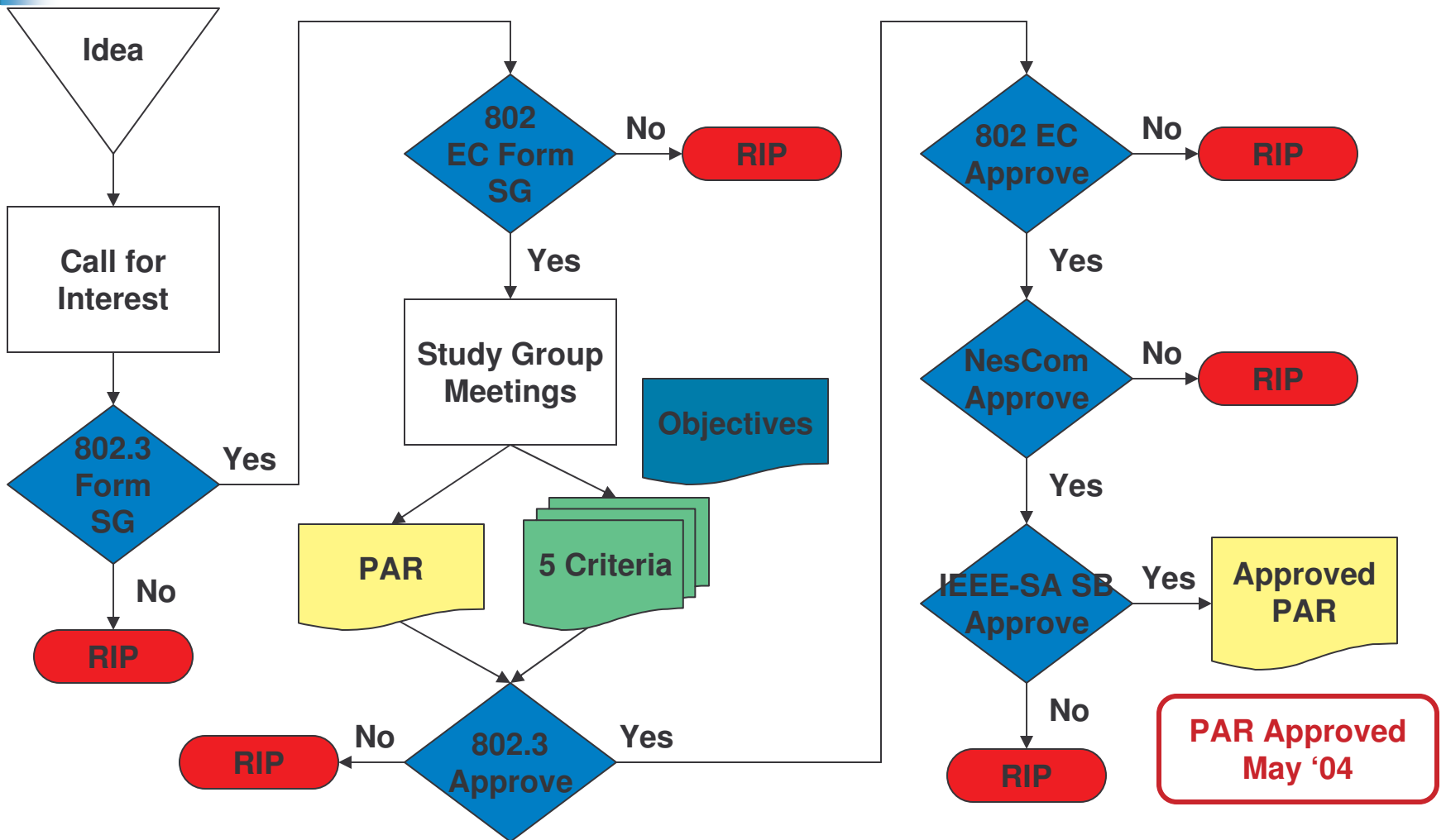**http://standards.ieee.org/board/pat/pat-slideset.ppt**

Approved by IEEE-SA Standards Board – March 2003 (Revised December 2004)
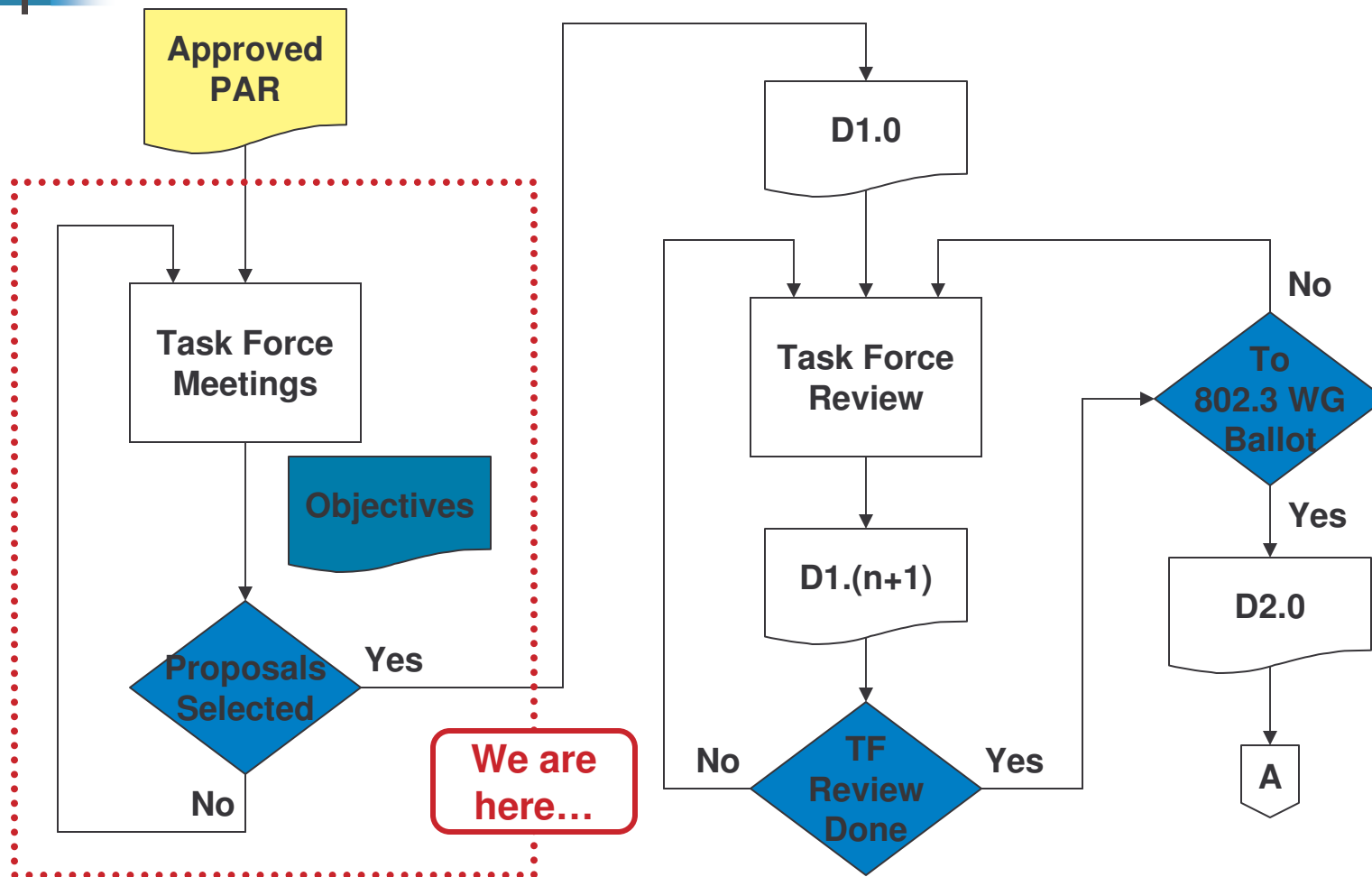
Process Overview

- Adopt proposals for the formation of a baseline

- Baseline is used to create Draft 1.0

- Draft 1.0 is reviewed by the Task Force
  - Comments on the draft are generated and resolved
  - Multiple iterations
  - When Task Force review is completed and the draft is technically complete…

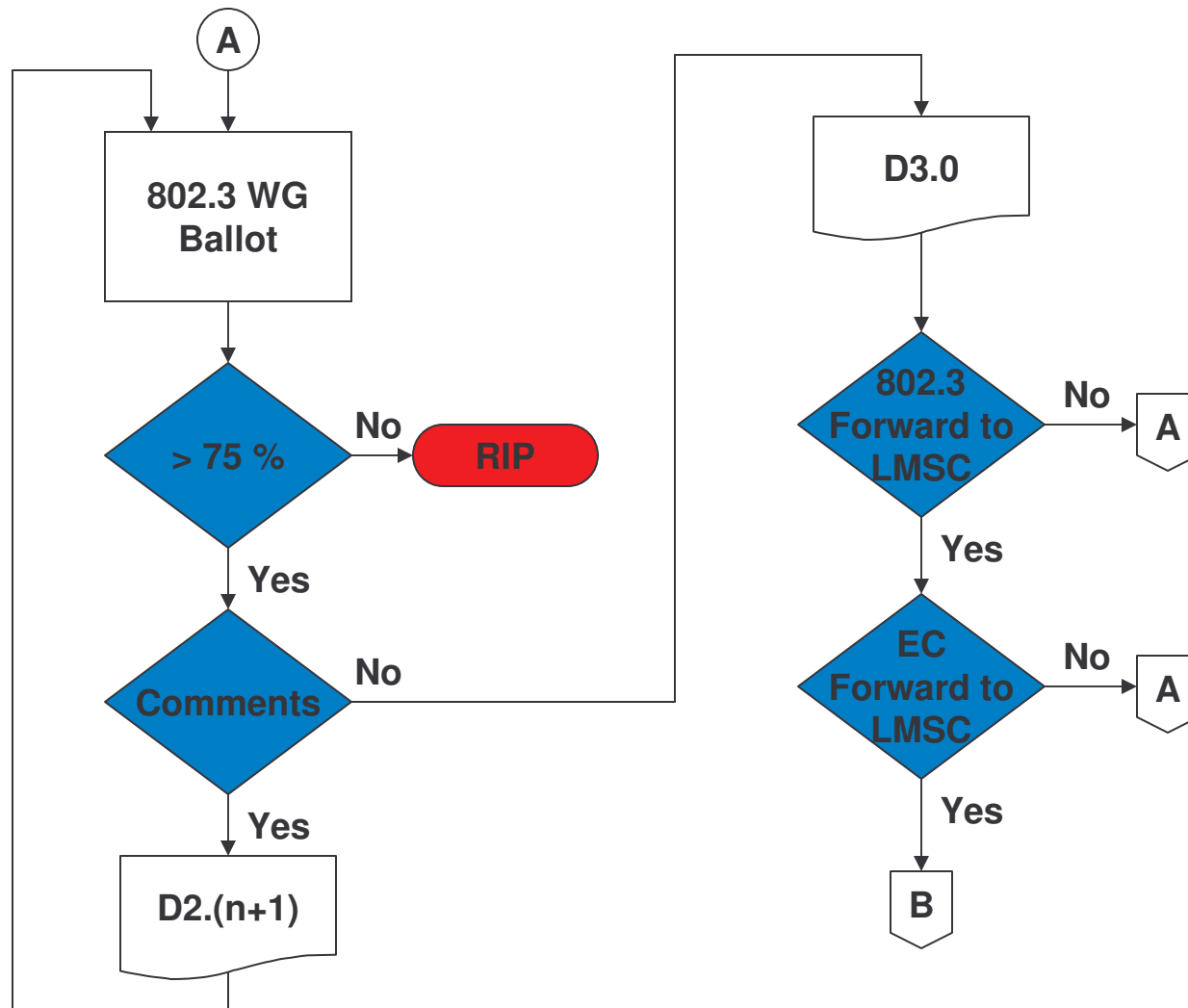- …ask the 802.3 working group to authorize a working group ballot (Draft 2.0)…

IEEE Standards Process

Idea → Call for Interest → 802.3 Form SG
- Yes → 802 EC Form SG
- No → RIP

802 EC Form SG
- No → RIP
- Yes → Study Group Meetings

Study Group Meetings → PAR, 5 Criteria (Objectives) → 802.3 Approve
- No → RIP
- Yes → 802 EC Approve

802 EC Approve
- No → RIP
- Yes → NesCom Approve

NesCom Approve
- No → RIP
- Yes → IEEE-SA SB Approve

IEEE-SA SB Approve
- Yes → Approved PAR
- No → RIP

PAR Approved May '04

IEEE Standards Process (cont.)

IEEE Standards Process (cont.)

A

802.3 WG Ballot

> 75 %

No → **RIP**

Yes

Comments

No

Yes

D2.(n+1)

D3.0

802.3 Forward to LMSC

No → **A**

Yes

EC Forward to LMSC

No → **A**

Yes

B

IEEE Standards Process (cont.)

B

LMSC Sponsor Ballot

> 75 % — No → **RIP**

Yes

Comments — No

Yes

D3.(n+1)

D3.n

802.3 Forward to RevCom — No → B

Yes

EC Forward to RevCom — No → B

Yes

RevCom Review

RevCom Approval — No → B

Yes

IEEE-SA SB Approval — No → **RIP**

Yes

Std
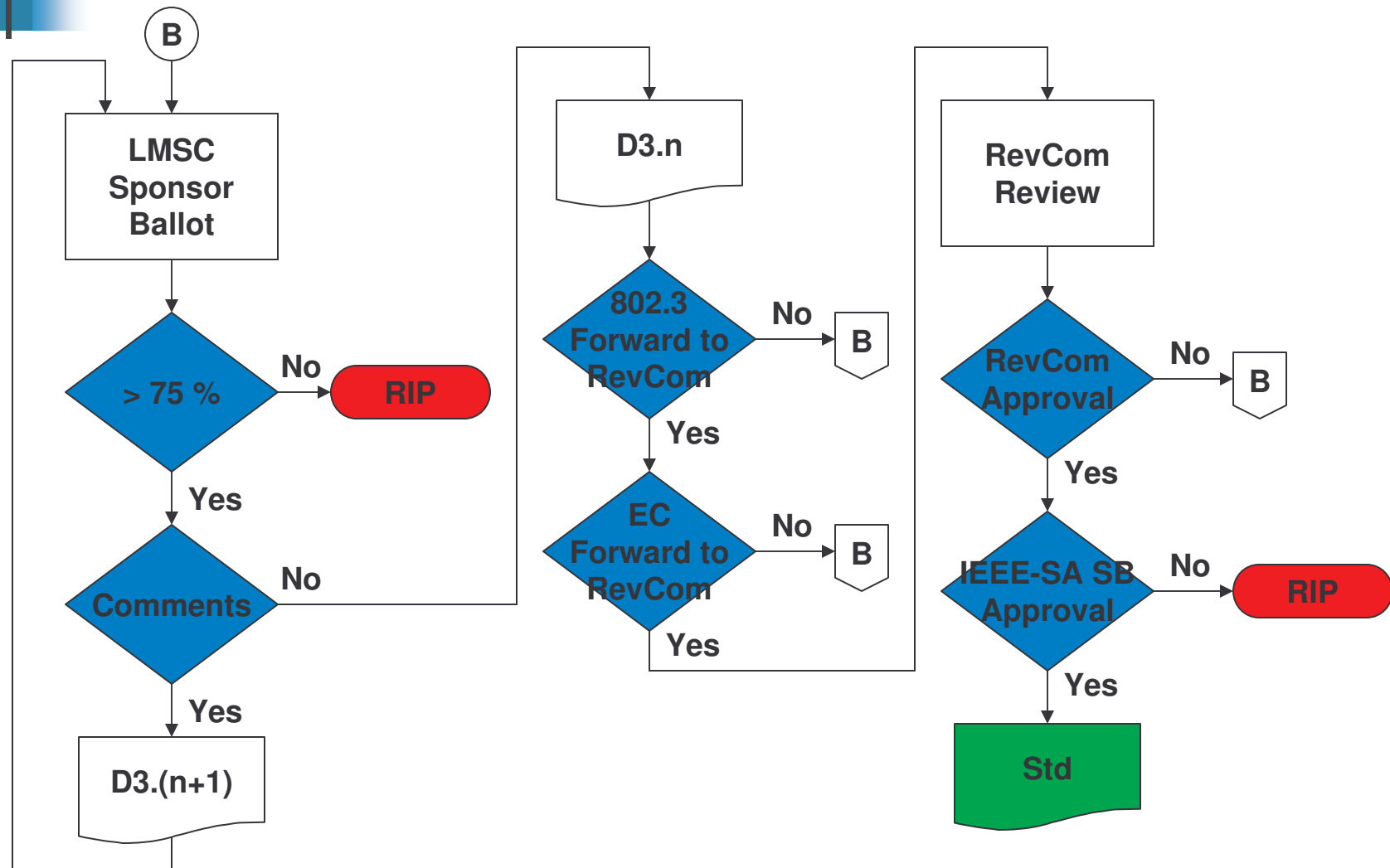
IEEE P802.3ap Task Force Documents

- Approved PAR

  http://standards.ieee.org/board/nes/projects/802-3ap.pdf

- 5 Criteria

  http://ieee802.org/3/ap/802_3_ap_5criteria.pdf
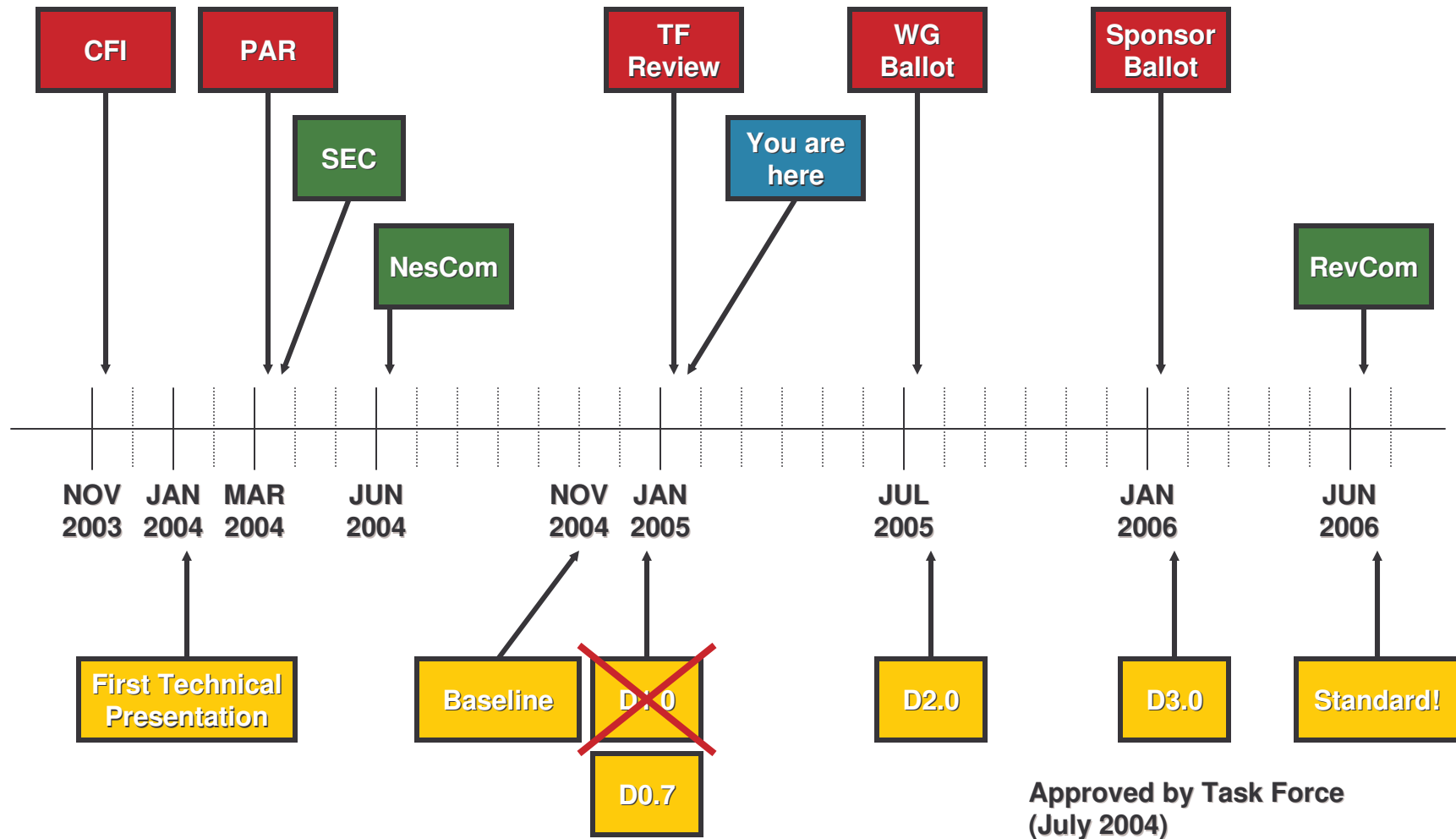
- Objectives

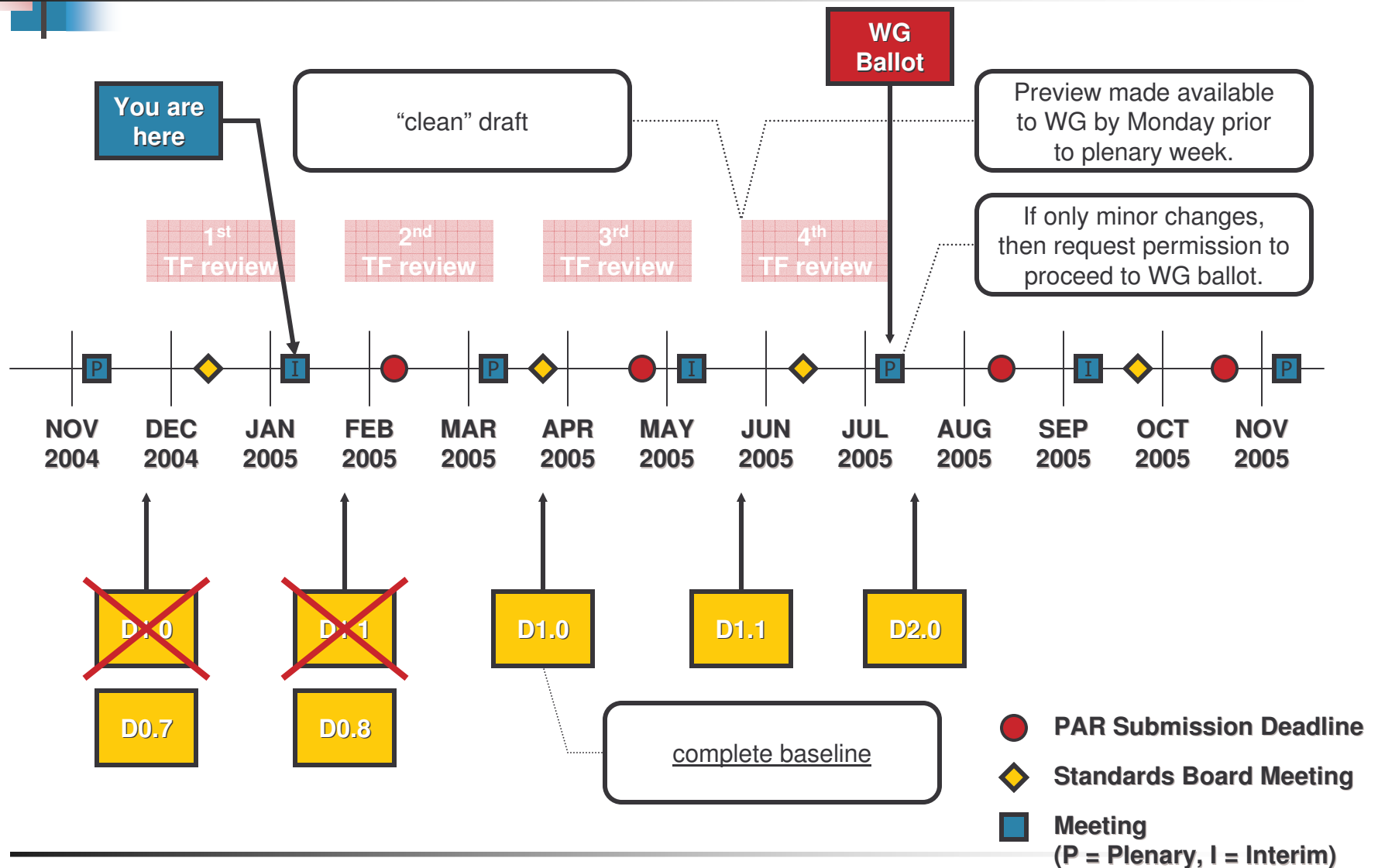 *http://ieee802.org/3/ap/802_3_ap_objectives.pdf*

IEEE P802.3ap 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 existing media independent interfaces.**

- **Support operation over a single lane across 2 connectors over copper traces on improved FR-4 for links consistent with lengths up to at least 1m.**
  - **Define a 1 Gb/s PHY**
  - **Define a 10 Gb/s PHY**

- **Define a 4-lane 10Gb/s PHY for operation over the 802.3ap channel model.**

- **Consider auto-negotiation.**

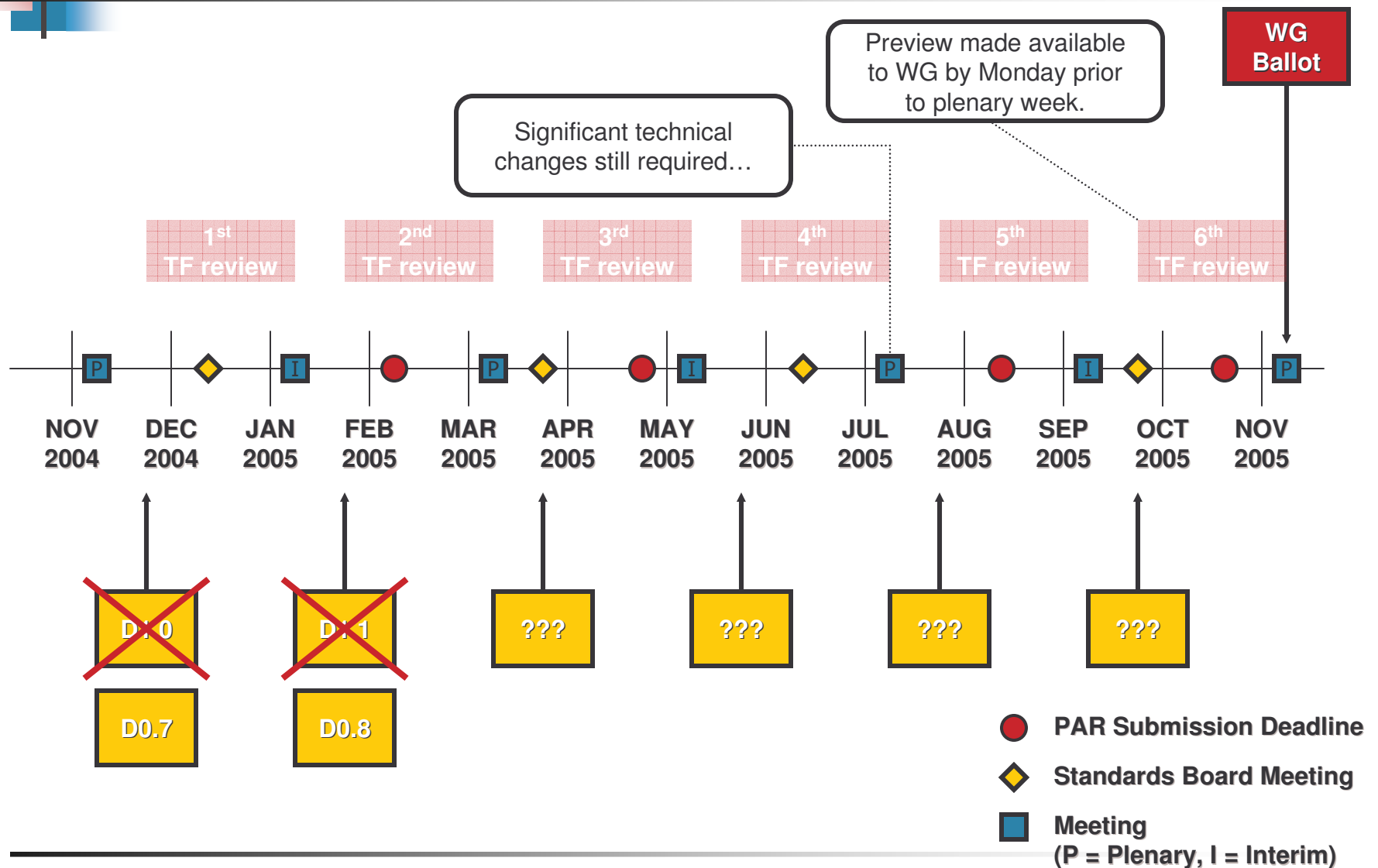- **Support BER of 10^-12 or better.**

- **Meet CISPR/FCC Class A.**

IEEE P802.3ap Timeline

CFI	PAR		TF Review	WG Ballot	Sponsor Ballot	
	SEC		You are here			RevCom
		NesCom				

NOV 2003	JAN 2004	MAR 2004	JUN 2004	NOV 2004	JAN 2005	JUL 2005	JAN 2006	JUN 2006

First Technical Presentation		Baseline	D1.0		D2.0	D3.0	Standard!

D0.7

Approved by Task Force (July 2004)

Timeline Detail (Target)

WG Ballot

You are here

"clean" draft

Preview made available to WG by Monday prior to plenary week.

| 1st TF review | 2nd TF review | 3rd TF review | 4th TF review |

If only minor changes, then request permission to proceed to WG ballot.

P — I — P — I — P — I — P

| NOV 2004 | DEC 2004 | JAN 2005 | FEB 2005 | MAR 2005 | APR 2005 | MAY 2005 | JUN 2005 | JUL 2005 | AUG 2005 | SEP 2005 | OCT 2005 | NOV 2005 |

D1.0 (crossed out) D1.1 (crossed out) D1.0 D1.1 D2.0

D0.7 D0.8

complete baseline

● **PAR Submission Deadline**

◆ **Standards Board Meeting**

■ **Meeting (P = Plenary, I = Interim)**

"Plan B" Timeline (4 month slip)

WG Ballot

Preview made available to WG by Monday prior to plenary week.

Significant technical changes still required…

| 1st TF review | 2nd TF review | 3rd TF review | 4th TF review | 5th TF review | 6th TF review |

NOV 2004 | DEC 2004 | JAN 2005 | FEB 2005 | MAR 2005 | APR 2005 | MAY 2005 | JUN 2005 | JUL 2005 | AUG 2005 | SEP 2005 | OCT 2005 | NOV 2005

D0.0 ~~(crossed out)~~

D0.1 ~~(crossed out)~~

??? ??? ??? ???

D0.7

D0.8

● PAR Submission Deadline

◆ Standards Board Meeting

■ Meeting (P = Plenary, I = Interim)

Presentations…

Presentation Agenda (Monday 1/24)

8:30 AM		Agenda and General Information	0:30
9:00 AM	van Doorn	Editor's Report	0:20
9:20 AM	Altmann	Signaling ad hoc report-out	0:40
10:00 AM		**Break**	**0:15**
10:15 AM	Sawyer	10.3125Gbps NRZ Simulation Results Using "StatEye" and "Signal to Interference Model" on Cascaded Channel Components	0:40
10:55 AM	Abler	NRZ simulation results over ad-hoc channels	0:30
11:25 AM	Anderson	Simulations of Duobinary and NRZ Over Selected IEEE Channels, Including Jitter and Crosstalk	0:40
12:05 PM		**Lunch**	**1:30**
1:35 PM	Brink	10GBASE-KR Start-Up Protocol	0:30
2:05 PM	Gaither	10Gbps signaling proposal using Unified signalling	0:30
2:35 PM	Altmann	Proposal to Use PR-4 Signaling for 10GBASE-KR Links	0:40
3:15 PM		**Break**	**0:15**
3:30 PM	Moore	Proposed Receiver Interference Tolerance Specification	0:40
4:10 PM	Healey	Channel Model Ad Hoc Report	0:20
4:30 PM	Peters	HVM ATCA channel performance	0:30
5:00 PM	D'Ambrosia	Status Update: SDD21 and SDD11/SDD22 Model Developement	0:30
5:30 PM		**Break**	

Presentation Agenda (Tuesday 1/25)

8:30 AM	D'Ambrosia	Need for a Normative Channel Model Approach	0:20
8:50 AM	Lerer	Update on OIF Statistical Eye Activities	0:20
9:10 AM	Barazande-Pour	A close look at Statistical Eye Algorithm and Issues	0:20
9:30 AM	von Herzen	Crosstalk summation on 10G channels	0:15
9:45 AM		**Break**	**0:15**
10:00 AM	Gaither	Choose Signaling First	0:30
10:30 AM	Thaler	Transceiver friendly auto-negotiation signaling for 802.3ap	0:30
11:00 AM		Comment Resolution	1:00
12:00 PM		**Lunch**	**1:30**
1:30 PM		Comment Resolution	1:30
3:00 PM		**Break**	**0:15**
3:15 PM		Comment Resolution	2:15
5:30 PM		**Break**	

10GBASE-KR Discussion

Thoughts…

- IEEE P802.3ap is challenged with defining both the media and the PHY.

- This presents a very large solution space with many degrees of freedom in both backplane design and serdes architecture.

- There is not enough time to fully explore all corners of this solution space.

  - Several promising solutions have been presented to the Task Force.

- Question: Are there areas with sufficient agreement that we may reduce the search space and focus work on a smaller set of clearly-defined problems?

More thoughts…

- Perfection is NOT a requirement for a proposal to be adopted as a baseline text.
  - We have an effective and well-tested process for reporting and correcting problems with our draft. LET'S USE IT.
  - The detail of draft text exceeds what is typically captured in slides. The "second level" of issues is exposed through the review of this text.

- The Task Force needs to focus on the completion of the draft document.

- Remember, simply closing the "big ticket items" does not mark the completion of our work. It simply allows us to go the next level of detail.
  - There is a lot of work ahead of us!

10GBASE-KR (Easier?)

- ## 10.3125Gbaud +/- 100ppm?
  - No recent PAM-4 activity…

- ## 1 bit/symbol?
  - No recent PAM-4 activity…
  - PR-2, PR-4 pre-coders only encode 1 bit/symbol…

- ## Adaptive transmit equalization and accompanying start-up protocol.
  - Current proposals pointing to brink_01_0105.

10GBASE-KR (Harder…)

- Transmitter Electrical Specifications

  - Levels, transition time, jitter, and return loss per gaither_01_0105?

  - For these items, no alternative has been presented.

  - Commonality with OIF Common Electrical Interface?

- Receiver Electrical Specifications

  - Return loss, jitter tolerance per gaither_01_0105?

  - For these items, no alternative has been presented.

  - Commonality with OIF Common Electrical Interface?

10GBASE-KR (Are we ready yet?)

- Pre-coding (options identified).
  - a) No precoding.
  - b) x[n] = u[n] XOR u[n-1]
  - c) x[n] = u[n] XOR u[n-2]
  - d) a) or b), selectable at training

- Minimum number of TX FIR taps?

- Minimum TX FIR tap resolution?

- TX compliance methodology?
  - Never specified a dynamic transmitter before, will a mask set suffice?

- RX compliance methodology?
  - Is "interference tolerance" the prudent direction?

Motions…

Ad Hoc Meeting Schedule

- ## Signaling Ad Hoc
  - Friday, February 4 (7:30-9:30am PST)
    - Meeting to align on channel model components.
    - Peters – narrow down to ~6 candidates
  - Monday, February 28
    - Target date for simulation results (second meeting?).

- ## Channel Model Ad Hoc
  - Thursday, February 10
    - Methodology to derive time-domain data.
  - Wednesday, February 23
    - Identify time-domain parameters (Wednesday, Feb. 23)
  - Wednesday, March 2
    - Correlation with frequency-domain parameters

Draft Schedule

- Adopted proposals - new baseline text…
  - Rob Brink
  - John D'Ambrosia
  - Luke Chang / Ilango Ganga
  - Justin Gaither
  - Charles Moore
  - Pat Thaler

- Please get text to Schelto by February 9

- Review Period Open, Feburary 16 (proposed)

- Review Period Close, March 9 (proposed)

Big Tickets Items (remaining)

- Pre-coder decision
  - Guidance from simulation results.

- Normative channel specification.

- Populate informative channel specification values.

- 10GBASE-KR signal_detect.

Future Meetings

- ## March 2005 Plenary
  - Date: March 13-18, 2005
  - Location: Atlanta, GA

- ## May 2005 Interim
  - Date: TBD
  - Location: TBD

Adjourn

Thank You!

Motion Slides

Please refer to meeting minutes for complete list of motions and straw polls.

Motion #2

- Move that the Task Force adopt the following as part of the baseline for 10GBASE-KR
  - 10.3125Gbaud
  - 1 bit/symbols
  - Adaptive transmitter and start-up protocol per brink_01_0105, as mandatory to implement and optional to use.

- Moved: Brian von Herzen

- Second: Justin Gaither

- Technical (>= 75%)

- All: Y: 39, N: 0, A: 2 (PASSES)

Motion #3

- Move that the Task Force adopt thaler_01_0105, including 49th bit to remove periodicity.

- Moved: Pat Thaler

- Second: Justin Gaither

- Technical (>= 75%)

- All: Y: 32 , N: 0 , A:5   Motion Passes

Straw Poll #1

- Adopt gaither_01_0105 as the basis for 10GBASE-KR

- Yes - 15
- No – 15

Motion #4

- Move that the Task Force adopt the electrical specifications (Slides 12,13,16,17,18,19, 20) from gaither_01_0105, as the basis for 10GBASE-KR.

- Moved: Justin Gaither

- Second: Brian Seemann

- Technical (>= 75%)

- All: Y: , N: , A: Motion

- Question divided by motion #5.

Motion #5

- Move to divide Motion #4
    - Slide 20
    - Slides 12,13,16,17,18,19

- Moved: Pat Thaler

- Second: Aniruddha Kundu

- Procedural (> 50%)

- All: Y: 20, N:9 , A:12   Motion Passes

Motion #6

- Move that the Task Force adopt the electrical specifications (Slides 12,13,16,17,18,19) from gaither_01_0105, as the basis for 10GBASE-KR.

- Moved: Justin Gaither

- Second: Brian Seemann

- Technical (>= 75%)

- All: Y: 38, N:0 , A:2   Motion Passes

Motion #7

- Move that the Task Force adopt Slide 20 from gaither_01_0105, as the basis for 10GBASE-KR.

- Moved: Justin Gaither

- Second: Brian Seemann

- Technical (>= 75%)

- All: Y: 32, N:1,   A:6   Motion Passes

- 802.3 only: Y:16, N:0, A:7

Motion #15

- Move that normative channel specification be defined in the time domain (applies to analysis and not necessarily measurement).

- Moved: Charles Moore

- Seconded: Steve Anderson

- Technical (>=75%)

- All, Y: 23, N: 2, A: 9

- 802.3, Y: 13, N: 1, A: 7

- Motion Passes

Motion #16

- Direct the channel model ad hoc to include reference transmitter, receiver, terminations (package and IC), and TP4-TP5 segment in the normative channel specification.

- Moved: Justin Gaither

- Seconded: John D'Ambrosia

- Technical (>=75%)

- All, Y: 25, N: 1, A: 10

- 802.3, Y: 16, N: 0, A: 7

- Motion Passes

Motion #17

- Accept proposed comment resolutions and direct editor to create Draft 0.8 based on comment resolutions and adopted proposals and submit to the Task Force for review.

  - Moved: Tom Palkert
  - Seconded: Mike Altmann
  - Technical (>= 75%)
  - (All) Y: 37, N: 0, A: 0
  - Motion Passes