

# 802.3an 10GBASE-T Document Structure

---

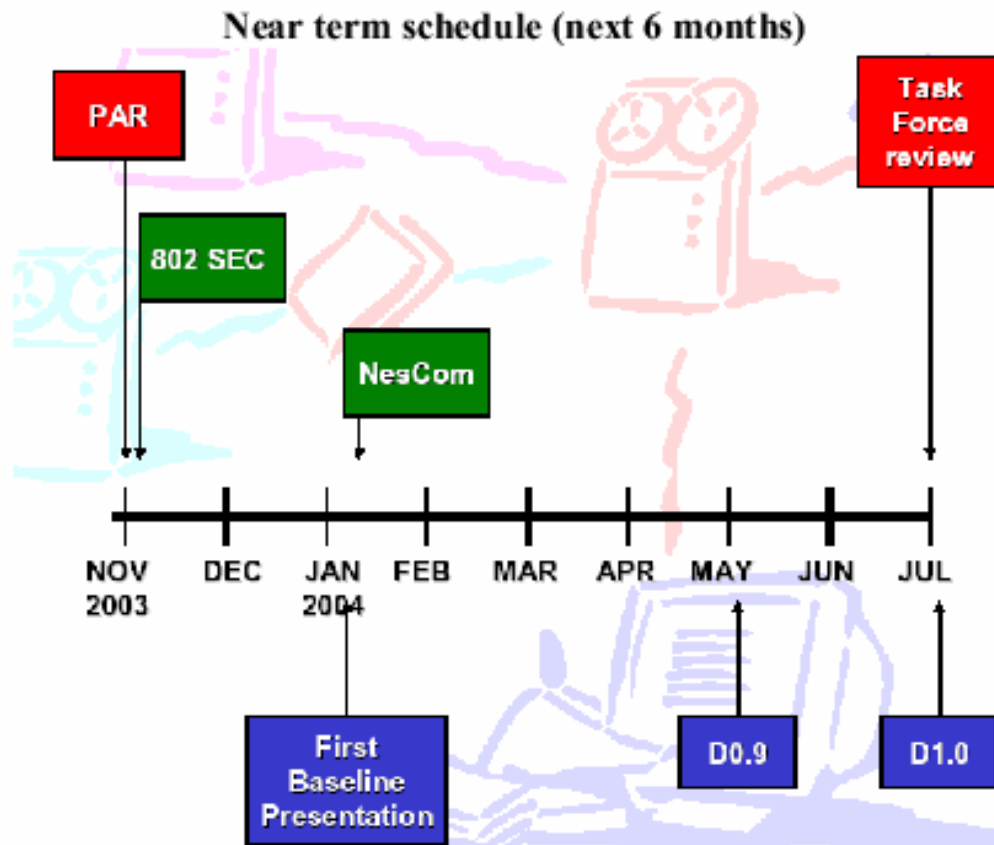
Sanjay Kasturia

(650) 704 7686  
[skasturia@teranetics.com](mailto:skasturia@teranetics.com)

- First pass at 802.3an 10GBASE-T document structure
  - The document structure will evolve
  - Overview of Document Architecture
    - NOT Implementation Architecture
- Motivated by goal set by chair (B. Booth)
  - "...generate draft D1.0 coming out of the July 802 Plenary meeting..."
  - ...we have ~~8~~ 7 months in which to develop consensus on the baseline for the first draft. "
  - Draft 0.9 coming out of the May meeting
- The key is developing consensus on a core proposal but...
  - This covers more than PAM, coding and choice of cable
  - The "creating a draft" part of the work is substantial

- Modifications of existing clauses
  - Some from 802.3ae, some from 802.3
  - Some of these, e.g. 22 and 45 are being modified by 802.3ak (CX4) and 802.3ah (EFM)
- New clauses
- Modification of existing annexes
- New annexes
- This draft of the structure is based on limited inputs
- Next steps
  - Get broader input on what clauses may be affected
  - Sign up people to edit pieces
  - Size the scope of the editorial work
    - Evaluate distance from consensus
    - Estimate amount of work (number of pages?)
  - Plan out the work

# Schedule



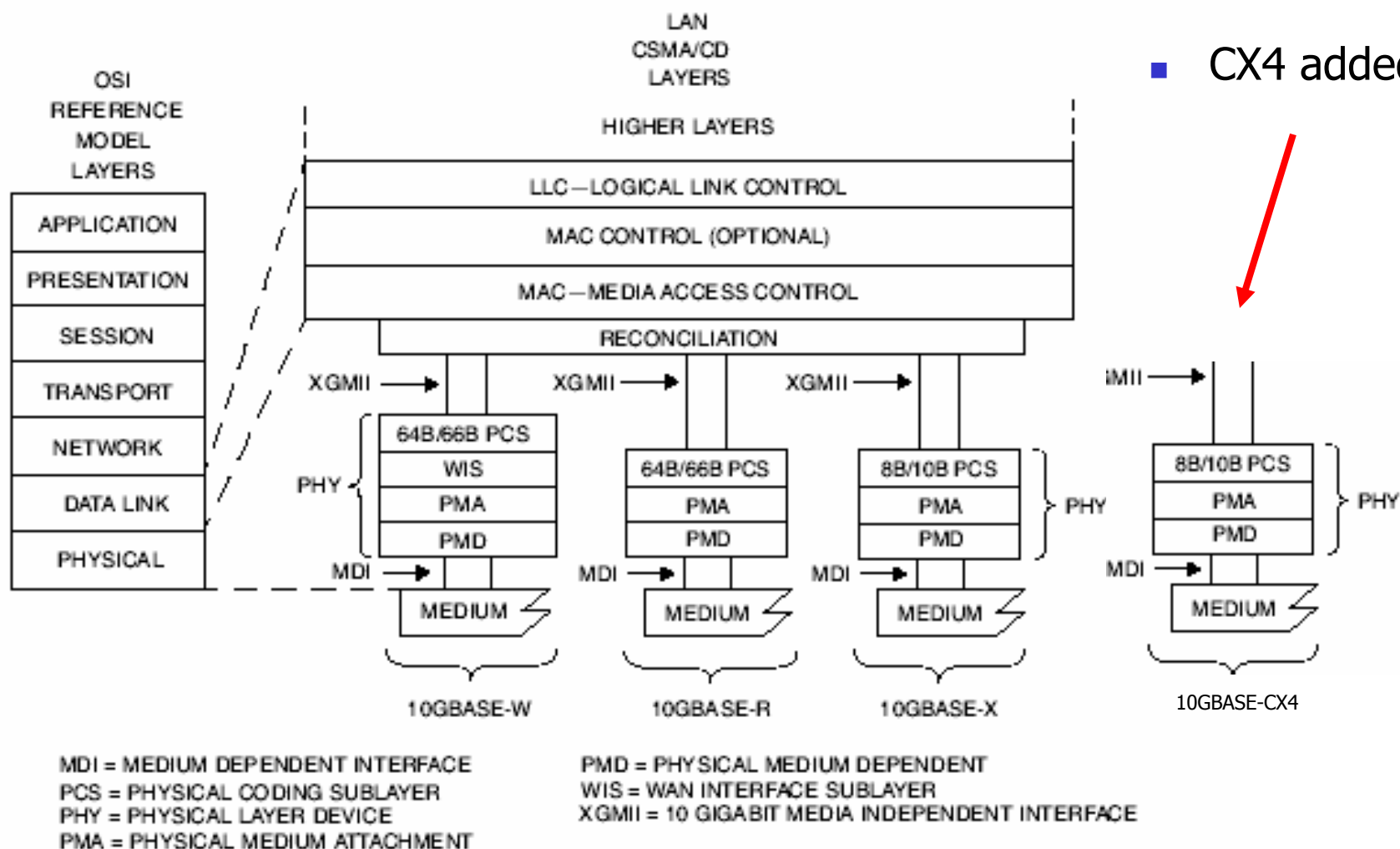
Date 12/05/03

Jeff Warren  
Independent Consultant  
IEEE P802.3™ 10GBASE-T Study Group Meeting

Page 5 of 23

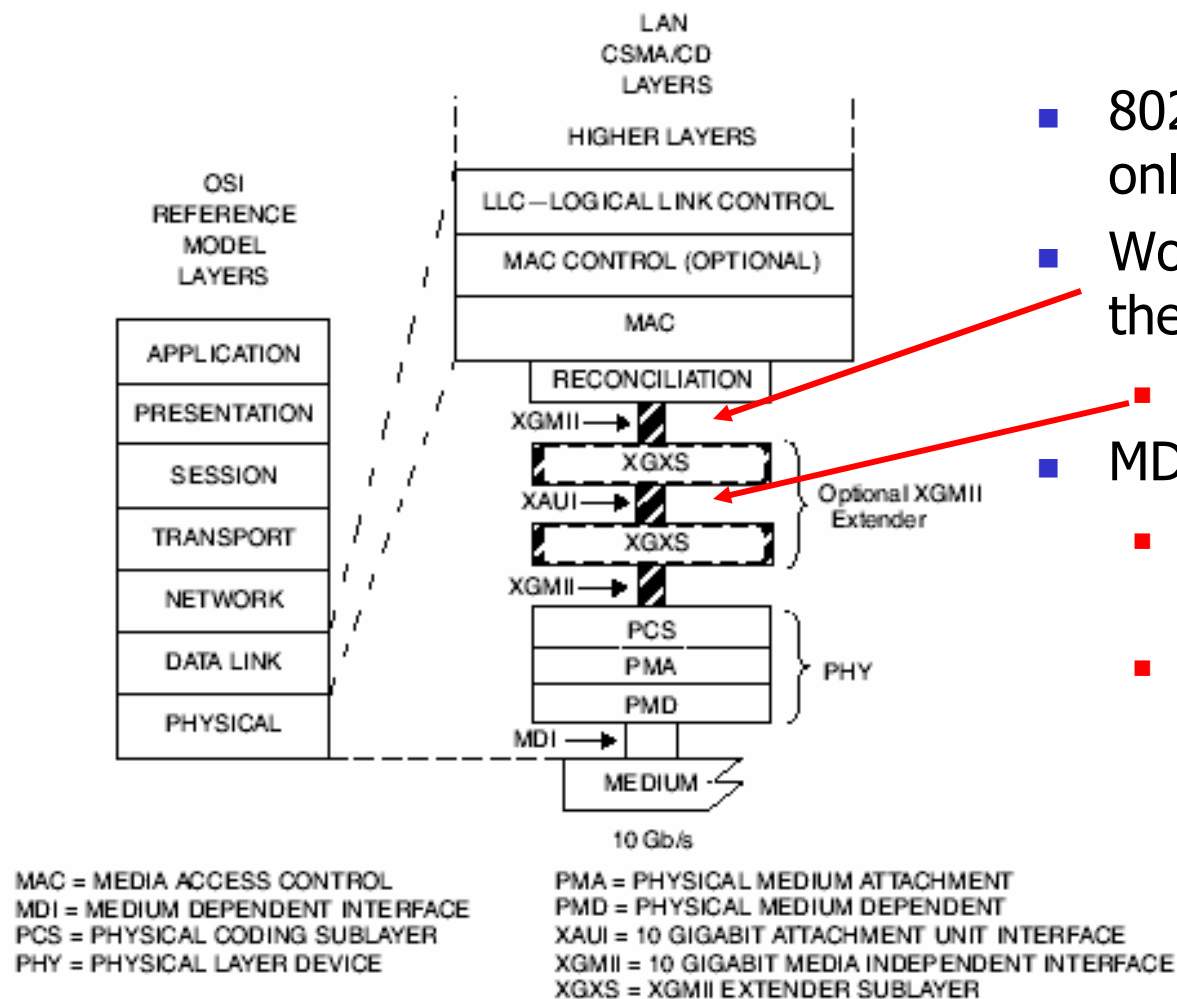
- To stay on this schedule, most of the clauses will have to be addressed by 5/04
- Some clauses will be heavily gated by our ability to reach consensus

# Context: Current 10G PHYs



**Figure 44-1 — Architectural positioning of 10 Gigabit Ethernet**

# Reference Layer Model



- 802.3an will address only the PHY
- Work with XGMII for the MAC interface
- XAUI comes with it
- MDI
  - Current connector is RJ45
  - Do we need a new connector for CAT-7?

**Figure 47-1 — XAUI and XGXS relationship to the ISO/IEC Open Systems Interconnection (OSI) reference model and the IEEE 802.3 CSMA/CD LAN model**

- Clause 55 has been reserved for 10GBASE-T
  - 10GBASE-T has greater similarities to 1000BASE-T than 10GBASE-X, 10GBASE-R or 10GBASE-W
  - The structure of clause 55 will be similar to Clause 40
- The MAC interfaces that are relevant are:
  - XGMII – Clause 46
  - XAUI – Clause 47
  - The 10G reconciliation sublayer is Clause 46
  - 46, 47 currently resides in 802.3ae
- Auto-negotiation will require editing of Clause 28
- 10GBASE-T will impact management – Clause 45
- A number of other clauses may be impacted but the work on this is likely to be less substantial
  - Clauses 1, 22, 30, 40, 44 etc.

- Clause 1:
  - Introduction
- Clause 22:
  - Reconciliation Sublayer and Media Independent Interface
- Clause 28:
  - Physical Layer link signaling for 10 Mb/s, 100 Mb/s, and 1000 Mb/s Auto-negotiation on twisted pair
- Clause 30:
  - 10 Mb/s, 100 Mb/s, 1000 Mb/s, MAC Control, and Link Aggregation Management
- Clause 40
  - PCS and PMA medium, type 1000BASE-T
- Clause 44:
  - Introduction to 10 Gb/s baseband network
- Clause 45:
  - Management Data Input/Output Interface
- Some are being changed by 802.3ak and ah



- Clause 55:
  - PCS, PMA and MDI for 10GBASE-T
  - Similar in structure to Clause 40 (1000BASE-T)
- Significant subclauses are likely to be:
  - Overview
  - 10GBASE-T Service Primitives and Interfaces
  - Physical Coding Sublayer (PCS)
    - PCS functions
      - Reset , transmission enable, transmit, receive
    - Stream Structure
    - State variables
    - State diagrams
  - Physical Medium Attachment (PMA) sublayer
    - PMA functional specifications
    - PMA functions
    - MDI signals transmitted by the PHY
    - Automatic MDI/MDI-X Configuration
    - State variables
    - State diagrams
  - Management interface
  - PMA electrical specification
  - Link segment characteristics
    - How do we address the multiple link types?
      - CAT 7, CAT 6, CAT 6e
    - New links
    - Installed base
  - MDI specification
  - Environmental specifications
  - PHY labeling
  - Delay constraints
  - Protocol implementation conformance statement (PICS) proforma for Clause 55

- Annexes that need modification (from Eric Lynskey)
  - 28B: IEEE 802.3 Selector Base Page definition
  - 28C: Next Page Message Code Field definitions
  - 28D: Description of extensions to Clause 28 and associated annexes
  - 40C: Add-on interface for additional Next Pages
- New annexes
  - To be identified

# Editorial Responsibilities

clause		Description	clause editor	company	pages
1		Introduction			32
28		Physical Layer link signaling for 10 Mb/s, 100 Mb/s, and 1000 Mb/s Auto-negotiation on twisted pair	Eric Lynskey	UNH IOL	48
30		10 Mb/s, 100 Mb/s, 1000 Mb/s, MAC Control, and Link Aggregation Management	David Law	3 COM	76
40		PCS and PMA for 1000BASE-T			1
44		Introduction to 10 Gb/s baseband network			17
45		Management Data Input/Output Interface	Eric Lynskey	UNH IOL	86
55		PCS and PMA for 10GBASE-T			103
55	.1	Overview			7
55	.2	10GBASE-T Service Primitives and Interfaces			7
55	.3	Physical Coding Sublayer (PCS)			26
55	.3.1	PCS functions			15
55	.3.1.1	reset			1
55	.3.1.2	transmission enable			1
55	.3.1.3	transmit			13
55	.3.1.4	receive			2
55	.3.2	Stream Structure			1
55	.3.3	State variables			5
55	.3.4	State diagrams			6
55	.4	Physical Medium Attachment (PMA) sublayer			10
55	.4.1	PMA functional specifications			
55	.4.2	PMA functions			
55	.4.3	MDI signals transmitted by the PHY			
55	.4.4	Automatic MDI/MDI-X Configuration			
55	.4.5	State variables			
55	.4.6	State diagrams			
55	.5	Management interface			7
55	.6	PMA electrical specification			21
55	.7	Link segment characteristics			4
55	.7.1	CAT 7			4
55	.7.2	CAT 6e			4
55	.7.3	Qualified CAT 6			4
55	.7.4	Qualified channel of unknown cable type			4
55	.8	MDI specification			5
55	.9	Environmental specifications			2
55	.10	PHY labeling			1
55	.11	Delay constraints			2
55	.12	Protocol implementation conformance statement (PICS) proforma for Clause 55 - Physical coding sublayer (PCS), physical medium attachment (PMA) sublayer and baseband medium, type 10GBASE-T			19
					171

- Clause 28: Auto-negotiation – Eric Lynskey
- Clause 30: MAC control & link aggregation management – David Law
- In Clause 55:
  - Link segment characteristics in 10GBASE-T – Chris DiMinico

- Get broader input on what clauses may be affected
- Sign up people to edit pieces
- Some one to manage comments
- Size the scope of the editorial work
  - Evaluate distance from consensus
  - Estimate amount of work (number of pages?)
- Plan out the work and schedule of meetings
  - Aim to have draft 0.9 coming out of May meeting
  - Aim to have draft 1.0 coming out of July meeting
  - Some of the work will be heavily gated by consensus on core proposals