IEEE P802.3ae Document Structure

Brad Booth

March 2000

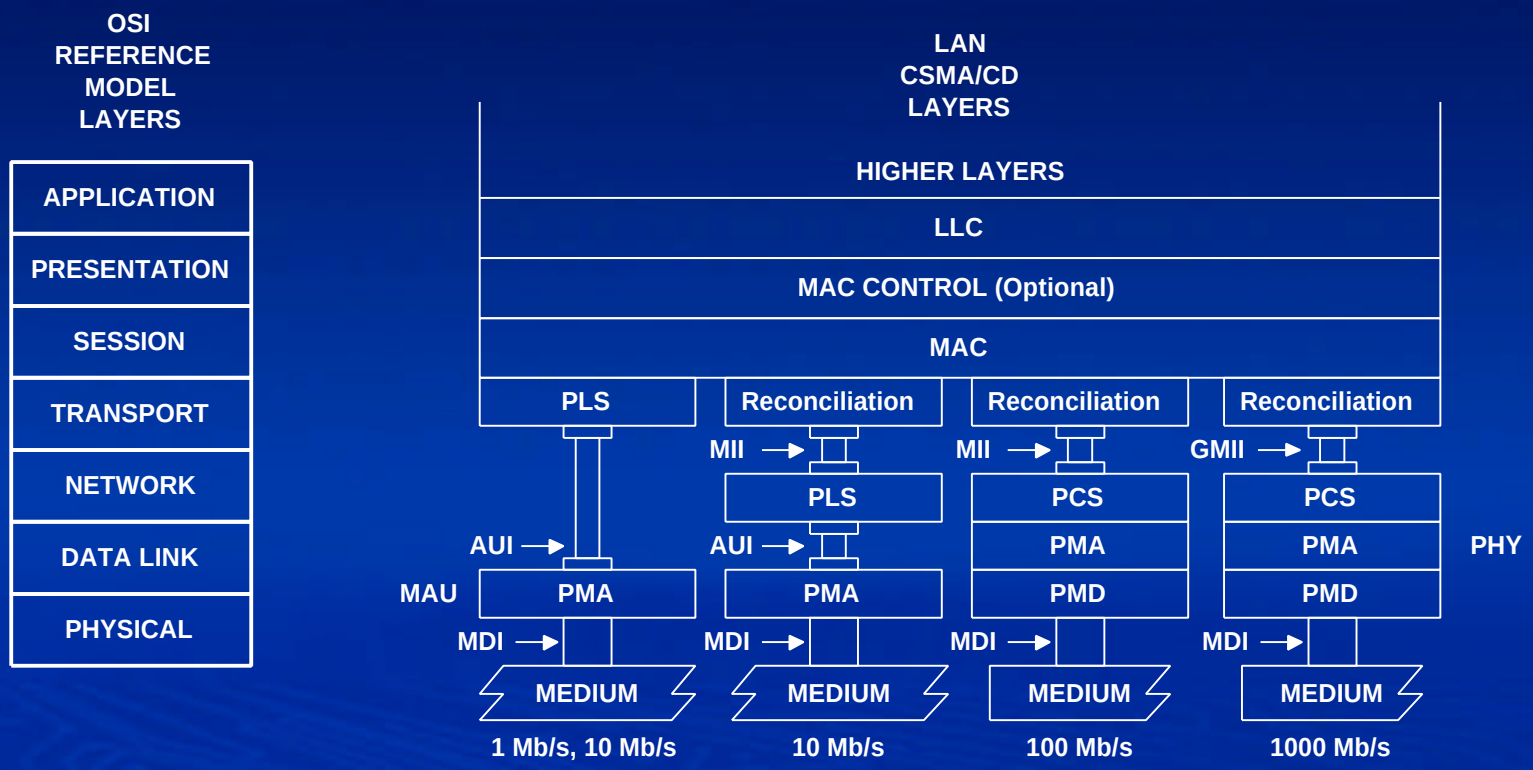
Contributions

- Ben Brown, Paul Bottorff - Nortel Networks
- Kevin Daines - World Wide Packets
- Bob Grow - Intel
- Shimon Muller - Sun Microsystems
- Howard Frazier - Cisco Systems
- Rich Taborek - nSerial
- Iain Verigin, Stuart Robinson - PMC-Sierra
- Jeff Lynch - IBM
- David Law - 3Com
- Members of the 10 GEA Technical Committee

Introduction

- **Second pass at possible P802.3ae document structure**
  - **David Law made a first pass in June 1999**
  - **Changes to existing clauses**
  - **Addition of new clauses**
- **Evolves as Task Force adopts "core" proposals**
- **Overview of the *Document Architecture*, NOT an *Implementation Architecture***

802.3 Layer Model



AUI = Attachment Unit Interface
MDI = Medium Dependent Interface
MII = Media Independent Interface
GMII = Gigabit Media Independent Interface
MAU = Medium Attachment Unit

PLS = Physical Layer Signaling
PCS = Physical Coding Sublayer
PMA = Physical Medium Attachment
PHY = Physical Layer Device
PMD = Physical Medium Dependent

Existing Clauses

- **Goal: to make MAC speed independent**
- **Clause 1 - Introduction**
  - **Layer diagram**
  - **Half duplex & CSMA/CD wording**
  - **Additions to definitions**
  - **Additions to abbreviations**
  - **Speed independent**

Existing Clauses (cont.)

- **Clause 2 - MAC Service**
  - **Layer diagram**
  - **Speed independent**
  - **Length**
- **Clause 3 - MAC Frame Structure**
  - **Speed independent**
  - **Length**

Existing Clauses (cont.)

- **Clause 4 - Media Access Control**
  - **Layer diagram**
  - **Rate adaptation implementation (if used)**
  - **Parameterized values**
  - **Speed independent**
  - **Length**
- **Clause 6 - PLS Service**
  - **Layer diagram**

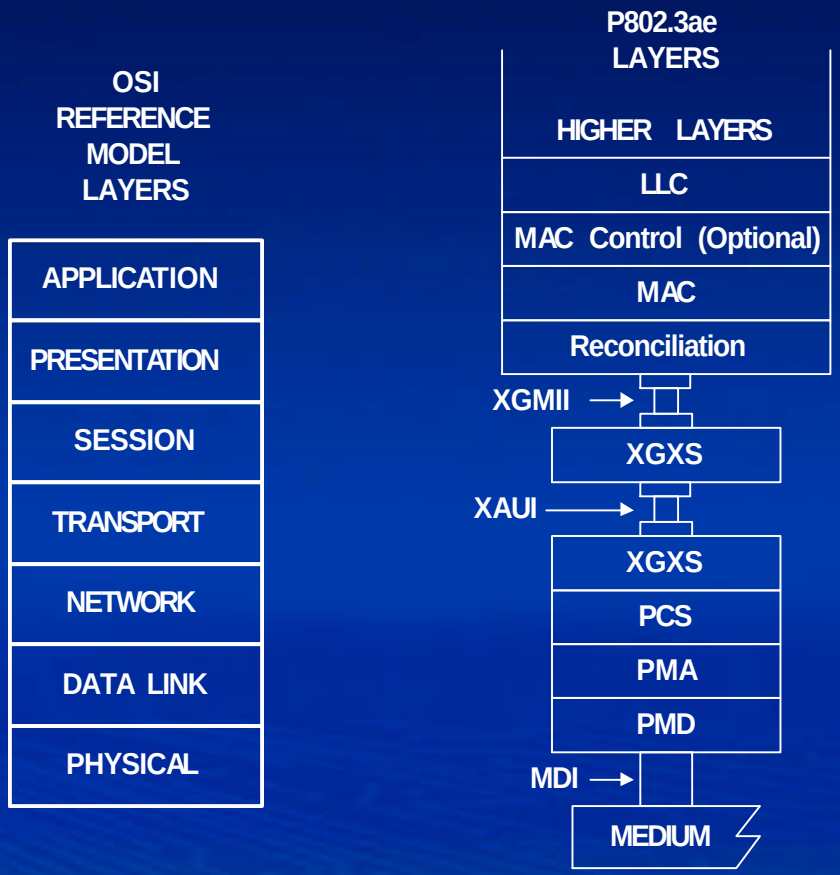
Existing Clauses (cont.)

- **Clause 22 - Reconciliation Sublayer & MII**
  - **Layer diagram**
  - **Management interface registers**
- **Clause 30 - Management**
  - **PHY/PMD attributes: changes and additions**
  - **Counter sizes already fixed**
  - **Link Aggregation revision**

Existing Clauses (cont.)

- **Annex 31B - MAC Control PAUSE**
  - **Need to evaluate quanta requirements**

P802.3ae Layer Model



MDI = Medium Dependent Interface
XGMII = 10 Gigabit Media Independent Interface
XAUI = 10 Gigabit Attachment Unit Interface
PCS = Physical Coding Sublayer

XGXS = XGMII Extender Sublayer
PMA = Physical Medium Attachment
PHY = Physical Layer Device
PMD = Physical Medium Dependent

Clause Information

- **Clause 43 taken by P802.3ad (Link Aggregation)**
- **P802.3af (DTE Power via MDI) may impact clause numbering**
- **Number of PCS's, PMA's and PMD's will impact clause numbering**

New Clauses

- **Clause 44 - Introduction to 10 Gb/s baseband network**
- **Clause 45 - Reconciliation Sublayer & 10G MII (XGMII)**
- **Clause 46 - XGMII Extender Sublayer (XGXS)**
- **Clause 47 - Physical coding sublayer (PCS)**

New Clauses (cont.)

- **Clause 48 - Physical medium attachment (PMA) sublayer**
- **Clause 49 - PMD #1**
- **Clause 50 - PMD #2**
- **Clause 51 - PMD #3**

P802.3ae Issues

- **WAN/LAN PHY (PCS & PMA)**
  - **PCS and PMA clauses may cover both variations**
  - **Is this possible? (Coding schemes)**
  - **Common ground? (Scrambler, SERDES, etc.)**
- **PMD's**
  - **Goal: to shorten list to a maximum of 3**

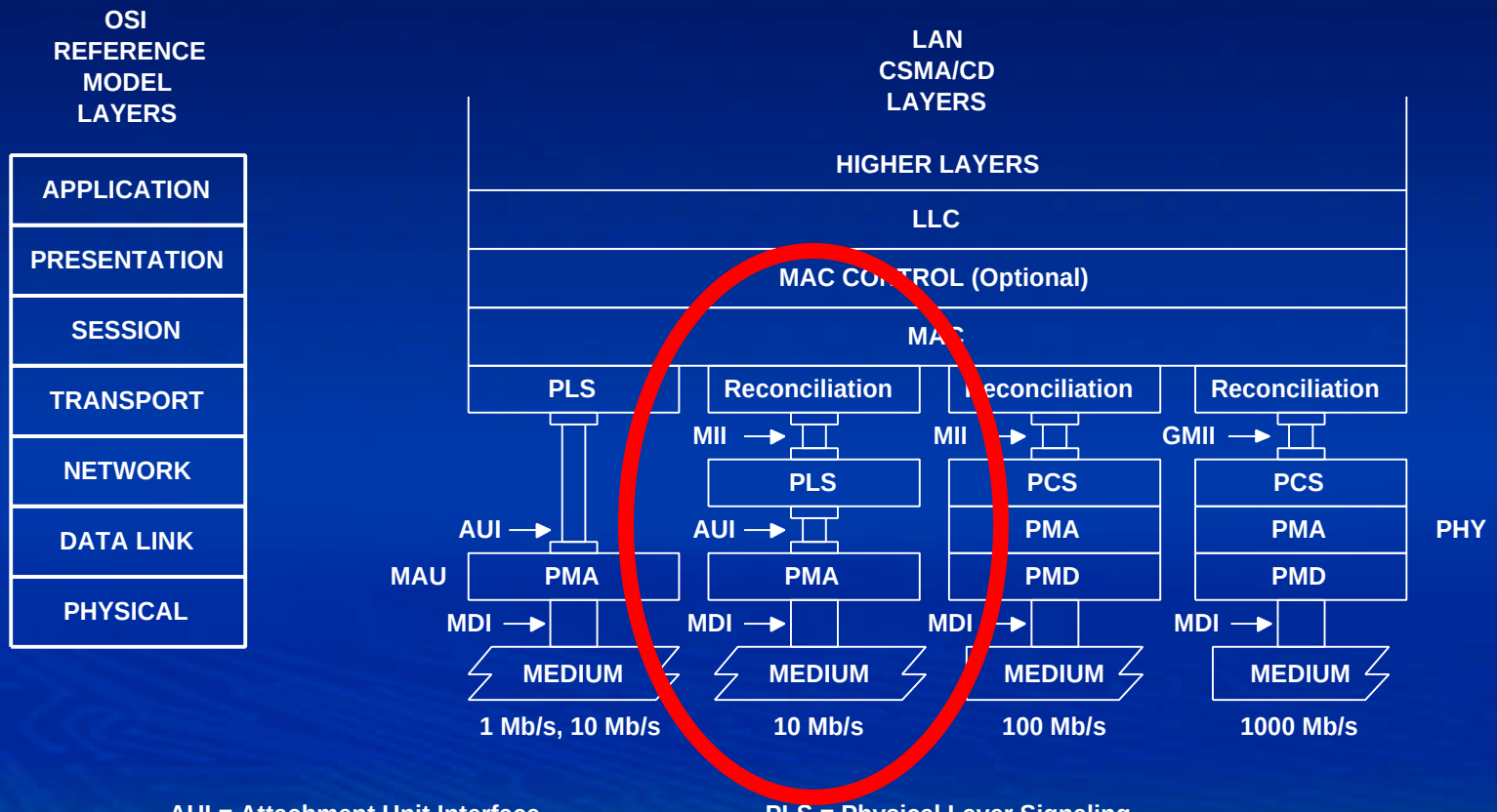
XGMII Extender (Clause 46)

- **XGXS = XGMII Extender Sublayer**
  - **Uses coding to increase reach of XGMII**
- **XAUI = 10 Gigabit Attachment Unit Interface**
- **Based on HARI proposal**

XGXS Highlights

- **Increased reach**
  - **XGMII is ~3” (~7 cm)**
  - **XAUI is ~20” (~50 cm)**
- **Lower connection count**
  - **XGMII is 74 wires (2 sets of 32 data, 4 control & 1 clock)**
  - **XAUI is 16 wires (2 sets of 4 differential pairs)**

Historical Information



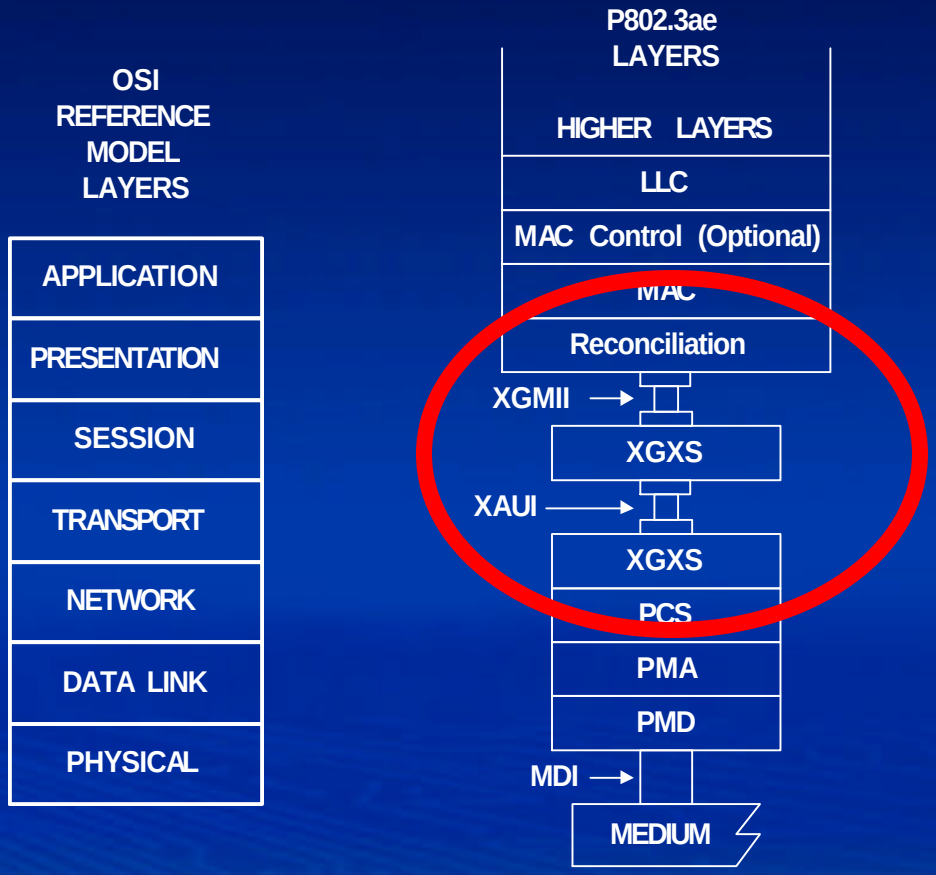
AUI = Attachment Unit Interface
MDI = Medium Dependent Interface
MII = Media Independent Interface
GMII = Gigabit Media Independent Interface
MAU = Medium Attachment Unit

PLS = Physical Layer Signaling
PCS = Physical Coding Sublayer
PMA = Physical Medium Attachment
PHY = Physical Layer Device
PMD = Physical Medium Dependent

Historical Information (cont.)

- **802.3z**
  - **No standardized instantiation of PMD Service Interface**
  - **GMII standardized instantiation of PCS Service Interface**
  - **TBI standardized instantiation of PMA Service Interface**
- **Industry specified instantiations of PCS Service Interface (SMII, RMII, etc.)**

P802.3ae Layer Model



MDI = Medium Dependent Interface
XGMII = 10 Gigabit Media Independent Interface
XAUI = 10 Gigabit Attachment Unit Interface
PCS = Physical Coding Sublayer

XGXS = XGMII Extender Sublayer
PMA = Physical Medium Attachment
PHY = Physical Layer Device
PMD = Physical Medium Dependent

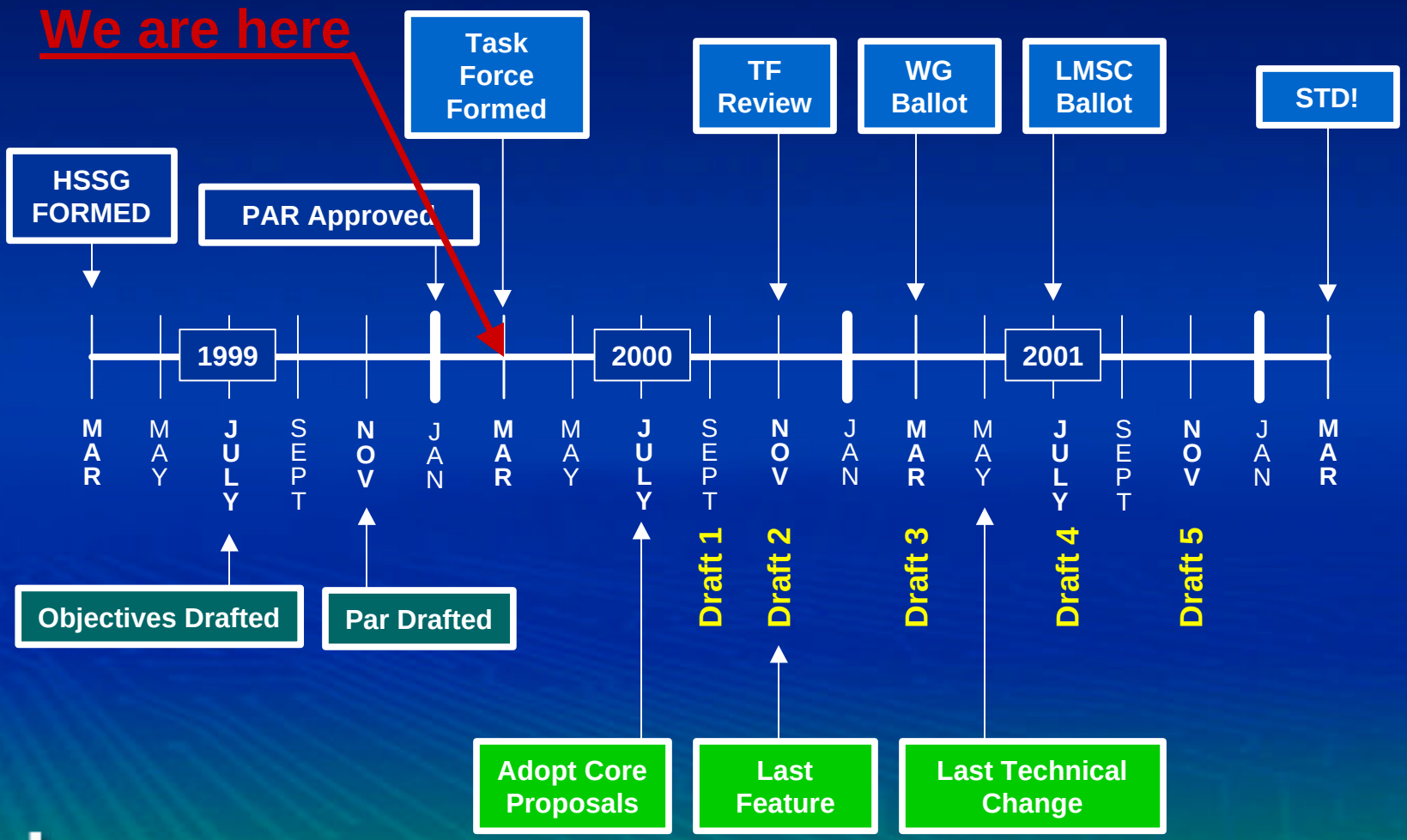
P802.3ae Layer Model (cont.)

- **XAUI is standardized instantiation of XGXS Service Interface**
- **XGMII is standardized instantiation of PCS Service Interface and the interface to the Reconciliation Sublayer**
- **PCS Service Interface between PCS and XGXS has no standardized instantiation - implementation specific**

Future Work

- Evaluate level of changes to clauses
  - Technical (Mild, Medium, Hot, Suicide)
  - Editorial (Minor, Junior, Senior, Pro)
- Draft 1.0
  - July - adopt “core” proposals
  - July - authorize distribution of D1.0 prior to September Interim Meeting
  - September - comment resolution on D1.0

Schedule


We are here
Task Force Formed
TF Review
WG Ballot
LMSC Ballot
STD!
HSSG FORMED
PAR Approved
1999
2000
2001
MAR MAY JULY SEPT NOV JAN MAR MAY JULY SEPT NOV JAN MAR MAY JULY SEPT NOV JAN MAR
Objectives Drafted
Par Drafted
Draft 1
Draft 2
Draft 3
Draft 4
Draft 5
Adopt Core Proposals
Last Feature
Last Technical Change

Conclusion

- **Agreement on the P802.3ae Layer Model will help:**
  - **Promote a base layer model for all proposals**
  - **Develop the P802.3ae document structure**
  - **In the creation of draft D1.0**
- **Reaching consensus on PCS, PMA and PMD will permit the Task Force to start the real work of developing a Standard**