

Generating the draft

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Introduction

- Primary task is to get consensus to generate a draft D1.0 coming out of the July 802 Plenary meeting...
- Have consensus on the following items
 - Channel models: form the basis of link segment
 - For PAM modulation, 8 or higher PAM
 - Transmit return loss specification
 - Define a power backoff scheme
- How far can we get with this?
- What do we need and in what priority order?

Framework

- Introduction
 - Overview, Objectives, Operation,
 - Functional blocks, Interfaces, Modes
- Interfaces and Service Primitives
- Physical Coding Sublayer
- Physical Medium Attachment Sublayer
- PMA Electrical Specifications
- MDI Interface Specifications
- Link segment characteristics
- Management Interface
 - Autonegotiations (AN), Power backoff (PB)
- Other: Environmental, etc.
- Protocol implementation conformance statements

Clause 55 Introduction

- Clause 55.1: Overview

- 55.1.1: Objectives

- 55.1.2: Relationship of 10GBASE-T to other standards

- 55.1.3: Operation of 10GBASE-T is where we get stuck... [..\\IEEE\802.3an\gige_pdf\802.3-2002.pdf](#)

The 10GBASE-T PHY employs full duplex baseband transmission over four pair cabling specified in [link segment spec]. The aggregate data rate of 10 Gb/s is achieved by transmission at a data rate of 2.5 Gb/s over each wire pair, as shown in Figure []. The use of hybrids and cancellers enables full duplex transmission by allowing symbols to be transmitted and received on the same wire pairs at the same time. Baseband [or other] signaling with a modulation rate of ??MHz is used on each of the wire pairs. The transmitted symbols are selected from a four-dimensional ?-level symbol constellation. Each four-dimensional symbol can be viewed as a 4-tuple (An, Bn, Cn, Dn) of one-dimensional symbols taken from the range {12 to -12} or ???.

10GBASE-T uses a continuous signaling system; in the absence of data, Idle symbols are transmitted. Idle mode is a subset of code-groups in that each symbol is restricted to the set {2, 0, -2} to improve synchronization. >8-level Pulse Amplitude Modulation or other modulation is employed for transmission over each wire pair. The modulation rate of ??? MBaud results in a symbol period of ?? ns.

A 1000BASE-T PHY can be configured either as a MASTER PHY or as a SLAVE PHY. The MASTER- SLAVE relationship between two stations sharing a link segment is established during Auto- Negotiation (see Clause 28, 55.?, and Annex 28C). The MASTER PHY uses a local clock to determine the timing of transmitter operations. The SLAVE PHY recovers the clock from the received signal and uses it to determine the timing of transmitter operations, i.e., it performs loop timing, as illustrated in Figure []. In a multiport to single-port connection, the multiport device is typically set to be MASTER and the single-port device is set to be SLAVE. The PCS and PMA subclauses of this document are summarized in 55.1.3.1 and 55.1.3.2. Figure [] shows the functional block diagram.

- 55.1.4 Signaling (for training and normal modes)

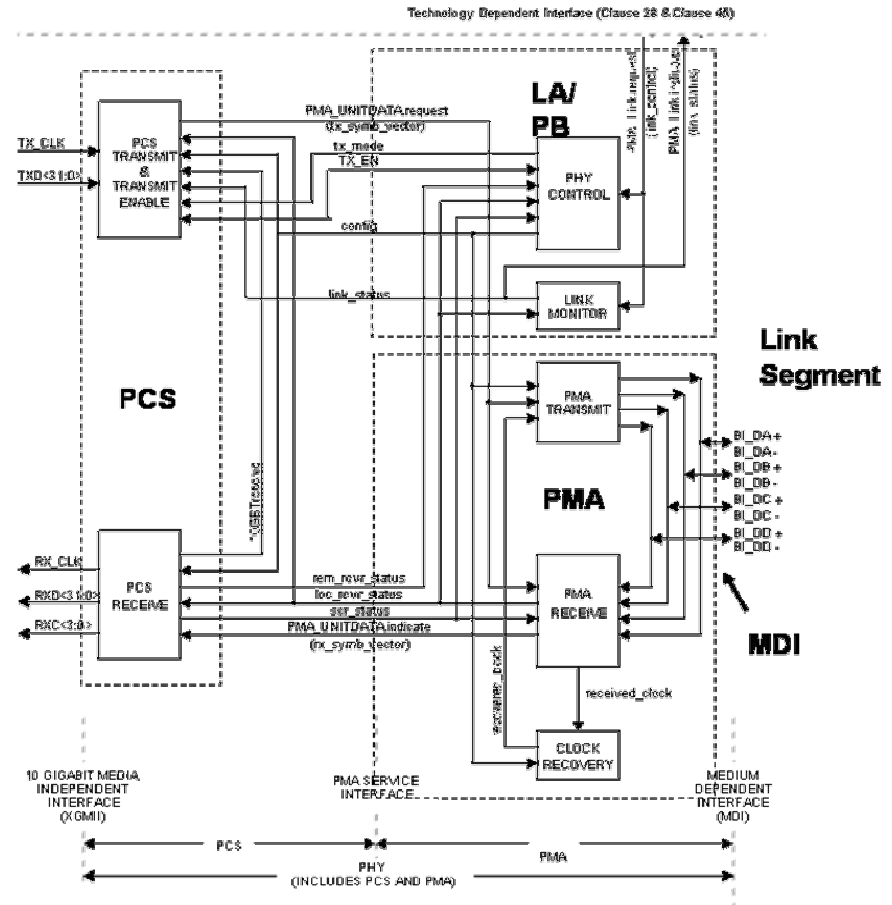
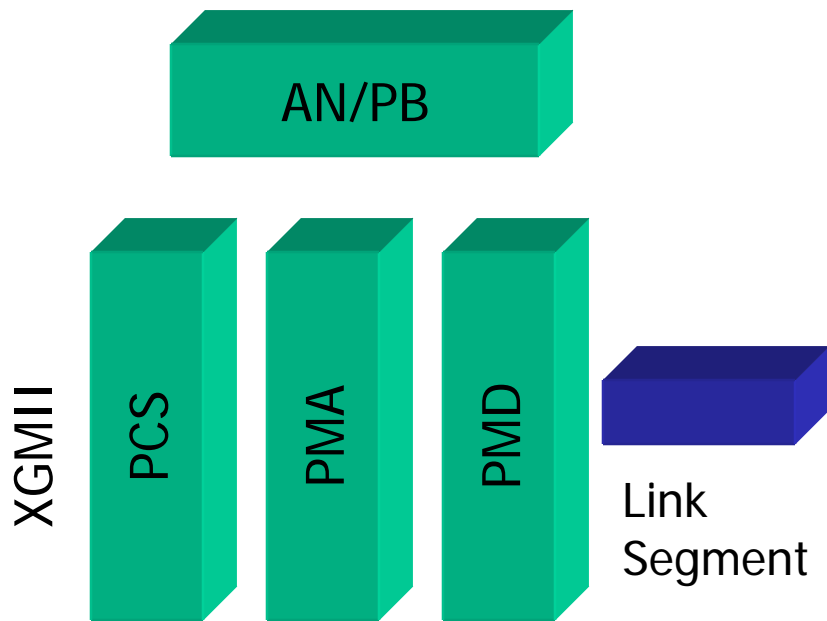
- 55.1.5 Inter-sublayer interfaces

- The functional block diagram and agreement on material already being debated will let us generate a reasonably complete 55.1. Decisions on the following will make it more complete:

- OFDM or PAM? Specific levels?
 - THP or no THP for PAM

Functional Block diagram

- Helps structure the Standard by identifying functions and interfaces
- Helps editors for each function proceed on their own pieces



NOTE—The recycled_clock line is shown to indicate delivery of the received clock signal back to PMA TRANSMIT for loop timing.

Figure 55-1—Functional block diagram

Physical Coding Sublayer (PCS)

- Physical Coding Sublayer (PCS)
 - Modulation:
 - Transmit processing:
 - Scrambling:
 - Framing:
 - FEC:
 - Precoding?
 - TX shaping?
 - Receiver operation
 - Startup:
 - Volunteers: Jose Tellado
- Decisions need to be made on material under discussion
- Startup will need serious scrutiny by the task force

Physical Medium Attachment

- PMA functions
 - MDI
 - Automatic MDI/MDI-X configuration
 - State variable and diagrams
 - Volunteers: ??
- PMA electrical specifications
 - PMA to MDI Interface tests
 - Electrical specifications
 - Volunteer: Sandeep Gupta

Other

- Management Interface and Auto-negotiation (AN)
 - Base page and next page exchange
 - Management registers
 - Power backoff
 - Volunteer: Eric Lynskey
- Link segment
 - Characteristics – Chris DiMinico
 - MDI specification – Terry Cobb
- Other
 - Environmental specifications
 - Misc.
- Protocol Implementation conformance statements

Choices

- Six proposals on the table - varying degrees of completeness
 - OFDM/LDPC higurashi_1_0504
 - THP/LDPC/12PAM seki_1_0504
 - THP/LDPC/8PAM rao_1_0504
 - DFE/TCM/10PAM mcclellan_1_0504, jones_1_0504
 - THP/LDPC/12PAM tellado_1_0504
 - THP/LDPC/8PAM takatori_1_0504
- Equalization debate
- Transmit voltage
- Power backoff
- Baud rate range
 - Impacts link segment specification
- Need to adopt a baseline proposal to meet schedule
 - Few proposals better for Task Force and Editors

Goals for this Meeting

- Adopt at least one proposal to support the Framework
 - PCS
 - PMA
 - PMA Electrical specifications
 - MDI Interface specifications
 - Management Interface & Auto Negotiation
- Link segment is done
 - Update as per feedback from ISO/IEC and TIA
 - Provide further guidance to ISO/IEC and TIA
- Subsequent meetings
 - Decisions on operation in all modes covering state diagrams
 - Detailed definition of management