

Completing the draft & analysis of comments on D1.2

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Introduction

- Draft 1.2 has been online; sympathy goes to
 - Brad Booth for Clause 1 & 44
 - Eric Lynskey for Clause 22, Clause 28 & 55.6
 - Mike McConnell for Clause 45
 - Jose Tellado for PCS and PMA sections
 - Sandeep Gupta for the PMA Electrical
 - Chris DiMinico for the Link Segment
 - Terry Cobb for the MDI and environmental specification
- The draft has been updated from D1.1
- We have ~110 comments
- We have ~200 TBDs in Draft 1.2
 - ~70 are on the PCS & PMA sections

TBD map (does not count all)

Clause

Amendment	1
28	3
44	2
45	22
55.1	1
55.2	2
55.3	46
55.4	17
55.5	33
55.6	52
55.8	1
55.11	3
55.12	26

Comments

- Numbers are approximate
- Substantial increase in participation
- ~22 are TR
- ~62 are T
- ~20 are E

Name	E	T	TR
Brad Booth	1	2	
Brett McClellan	6	15	
Chris Pagnanelli		2	4
Piers Dawe			2
Pat Thaler	1	3	3
Bijit Haldar	3	1	2
Mike McConnell		2	
Sandeep Gupta		10	
Jose Tellado	2	10	
Todd Thompson	2	5	4
Albert Vareljian		3	
Scott Powell		1	1
George Zimmerman	1	1	3
Gottfried Ungerboeck	5	1	
Joseph Babanezhad	1	2	
Mike Bennett, Katsutoshi Seki		1	
Sailesh Rao			1
Alan Flatman, Chris Diminico			1

Comment breakdown by clauses/topics

- Numbers are approximate
- Clause 28 :14
- Clause 44 : none
- Clause 45 : 9
- Clause 55
 - Introduction : 1
 - PCS/PMA :20
 - LDPC/DSQ : 5
 - THP : 5
 - Startup/Scrambler :10
 - PMA Electricals :22
 - Droop : 4
 - Linearity : 7
 - Voltage/Power : 4
 - PSD : 3
 - Jitter : 1
 - Management : 6
 - Cabling : 6

Major areas of focus for completion

- Complete changes to existing clauses
 - Clause 1, 22(?), 44, 45, 49(?)
 - Are there changes needed to Clause 49 registers relating to BER counts?
 - Mike to Look into it.
- Clause 55
 - Decision on scramblers/PRBS generators
 - Draft has two approaches for both PCS scrambler & PMA training
 - Complete specification for THP
 - Specific coefficient sets are still TBD
 - Further development of startup
 - Transmit PSD: add lower mask, provide TX power
 - Transmitter linearity/distortion specifications
 - Power backoff level-selection algorithm
 - Alien FEXT specification in link segment
 - Loop back & test patterns
 - Definition of PMD & PCS(?) management registers for Clause 45 (Mike McConnell)

Complete specification of THP

- Comment approved:
 - The THP coefficient shall be selected from a predetermined set of 4 IIR THP coefficients or 4 FIR coefficient THPs or the option of bypassing the THP altogether. Each of the THP filters (plus bypass) shall be optimized to a decreasing length of cable (from max length to 0m length). The THP filter coefficients shall be fixed after startup
- We now have detailed proposals
 - For IIR coefficient set
 - Sample sets provided earlier by Golden & Powell/Shen/Ungerboeck
 - ARMA(2,3), 6-8 bit coefficients
 - For FIR coefficient set
 - Sample sets provided earlier
 - Specific set proposed by Albert Vareljian – 12 taps, 7 bits
- This has been under discussion for a while. It is time to decide

Scramblers/MLSR generators

- PMA training
 - Have merged Seki's and Gottfried's proposals based on the 1000Base-T 32 bit MLSR repeating every TBD bits.
 - Need to decide the value of TBD or eliminate.
- PCS scrambler
 - Two alternatives proposed
 - Draft1.1/Seki/Brett. Based on 10GBase-R (Clause 49). Self-sync MLSR repeating every $2^{59}-1$ bits. Simpler synchronization but some error propagation
 - Gottfried. New side-stream scrambler based on a pair of 23 bit MLSR. Longer synchronization time but no error propagation
 - Need to make a decisions; choices are:
 - Consensus
 - Strawpoll
 - Toss a coin

Startup:

- Startup baseline generated in Nov'04 by merging ideas from Brett, Seki and Gottfried proposals
 - Addresses polarity, pair swap and pair skew and some information exchange (THP index, Power level, etc)
- Detailed start-up specification depends on several unresolved issues
 - PMA training
 - THP coefficient set definition, exchange and selection procedure
 - Power Back off algorithm
 - Need proposals
- No comments addressing start-up details such as PHY control state machine, Info Field bits, initial Power Backoff and initial THP coefficients, etc ...
- From here on, any proposal to change, PMA training, THP etc should come with text as well as modification to startup

More on Transmitter

- PSD
 - Lower limit on PSD proposed
- Power
 - Multiple proposals but all are close
- Voltage
 - Test pattern
 - Values
- Linearity
 - Test pattern
 - Values

Other items

- Power backoff level selection
- Loop back & test patterns
- Definition of PMD & PCS(?) management registers for Clause 45

Auto-Negotiation: updt

- Main technical issues
 - Clause 45 MDIO needs to be added and registers need to be created, mapping between Clause 22 and 45
 - How to handle 16-bit message codes when using extended next pages
 - Does startup proposal break any of the Clause 28 timers
- Lots of editorial clean-up
 - Template changes, PICS renumbering, change bars

Clause 55.8 open items

- **Clause 55.8.3.1**
-any reflection due to differential signals incident upon the MDI from a balanced cabling having an impedance of 100 ohms +/-1 **TBD** % is attenuated ...
- **Clause 55.8.3.2 MDI impedance balance**
- Editor's note: The impedance balance equation was obtained by processing the data provided by Pulse on the magnetics. Other factors contributing to the imbalance may require us to modify the above requirement. Please provide feedback on the feasibility of the above proposal.
- **Clause 55.8.3.3 MDI common-mode output voltage**
- Editor's note: 1000BASE-T specified 50 mv as the maximum permissible common-mode voltage. That number has been reduced to 15 mv because reducing it should make it easier to pass EMI. We need feedback from the Task Force on whether this value is feasible from an implementation point of view from both the PHY vendors and the magnetics manufactures.