

Completing the draft & analysis of comments on D1.3

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Introduction

- Draft 1.3 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 D1.2
- We have ~154 comments
- We have ~135 TBDs in Draft 1.3 (~106 without PICs)
 - ~50 are on the PCS & PMA sections
 - ~40 are on PMA electricals

TBD map (does not count all)

clause	subject	TBD
28		3
44		2
45		4
55.3	PCS	28
55.4	PMA	22
55.5	pmaelec	38
55.6	management	14
55.7	Link Segment	
55.8	MDI	1
55.11	Delay	3
55.12	PICS	22
Total		137

- PICS TBDs are placeholders

Comments

- Numbers are approximate
- Broad participation
- ~21 are TR
- ~73 are T
- ~60 are E

Name	E	T	TR
Brad Booth	17	16	1
Brett McClellan	0	11	0
Chris Pagnanelli	0	0	5
George Eisler	0	0	1
George Zimmerman	1	2	1
Bijit Haldar	0	3	0
Eric Lynskey	25	15	4
Scott Powell	0	0	3
Jose Tellado	2	17	1
Todd Thompson	15	3	1
Katsutoshi Seki	0	5	0
Terry Cobb	0	1	0
Alan Flatman	0	0	3

Major areas of focus for completion

- Complete changes to existing clauses
 - Clause 1, 28, 44, 45
- Clause 55
 - Complete specification for THP
 - Scrambler initialization
 - Further development of startup
 - Power backoff level-selection algorithm
 - Transmitter linearity/distortion specifications
 - Loop back & test patterns
 - Completion of Management register definition

Complete specification of THP

- Comments 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
 - Each THP in the set of FIR THPs shall consist of a max of 12 taps, each specified with 8bit values
- We now have one detailed proposal including:
 - For IIR coefficient set
 - Sample sets provided earlier by Golden & Powell/Shen/Ungerboeck
 - ARMA(2,3), 7-9 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

Transmitter

- Voltage
 - Eliminate or
 - Specify: One proposal
 - Test pattern
 - TBDnumsym +16, TBDnumsym -16: Set TBDnumsym=10
 - Values
 - 2v +-15%
- Linearity
 - Frequencies for single tone & for two tone
 - Normative values
 - Two proposals
 - $\text{Min}\{48, 58-20*\text{Log}_{10}(f/25)\}$
 - $\text{Min}\{52, 52-20*\text{Log}_{10}(f/50)\}$ which is equiv to $\text{Min}\{52, 58-20*\text{Log}_{10}(f/25)\}$
 - Hence $\text{Min}\{A, 58-20*\text{Log}_{10}(f/25)\}$ where A is 48 or 52
 - Recommended value
 - Eliminate or
 - Specify: One proposal : $X_{\text{nonlin}}=60, X_{\text{nl slope}}=0$
- Jitter
 - One proposal

Scramblers/MLSR generators

- PMA training
 - Based on the 1000Base-T 32 bit MLSR. Receiver can indicate to link partner to repeat every TBD bits.
 - Need to decide the value of TBD or eliminate. This is also tied to the Info Field repetition rate
 - One proposal – 2^{14}
- PCS scrambler
 - Master and Slave have different self sync MLSR.
 - Need to close on initial seed values.
 - Multiple proposals that have the same intent
 - Anything except all zeros should work

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
- Several 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, PBO, etc should come with text as well as modification to startup

Auto-Negotiation *Eric

- 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

Management *Eric

- Main technical issues