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Question: 4/15

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TITLE: Liaison to IEEE 802.3ah (EFM)

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Three standardization bodies are currently developing standards for Multi-pair transmission over copper pairs. The ITU-T has an ongoing project G.bond; T1E1.4 is developing bonding standards under its M^{2}DSL project, and the IEEE 802.3ah Ethernet in the First Mile (EFM) project also defines Multi-pair transmission.

All three standards are using G.994.1 for the same purpose, but currently, the IEEE has its own code tree, while the others are requesting parameters for the same functionality. This will result in duplicating the same parameters many times and causing unnecessary complexity and confusion.

During our meeting in Singapore, January 19 – 23, 2004, we discussed how best to handle G.994.1 parameters for these standards. It was agreed to define a common set of parameters within the Identification field to support discovery and aggregation for ethernet bonding and TDIM bonding for IEEE EFM, Committee T1 bonding standards as well as our future ITU-T G.bond. Attached for your review and comment is the complete set of parameters that we have agreed to include to support ethernet and TDIM bonding. We would request that you:
- remove G.994.1 parameter tables from your draft EFM standard pertaining to these parameters and to reference G.994.1.
- keep the definition of and procedures for using these parameters in your EFM standard.

For G.bond, it is our intention to reference the bonding discovery and aggregation text in the EFM standard. We will also recommend to T1E1.4 that they do the same.

In addition, it was agreed to define a new variable silence mode within the Standard information field. Also attached for your review and comment are the parameters for this mode. Since this is a G.994.1 operating mode and outside of the code point tree assigned to IEEE EFM, we will define its behaviour in G.994.1. We would request that you:
- remove any text describing the behaviour of this operating mode and to reference G.994.1

In our consideration of this new operating mode, we agreed to a coding of the time period that is more consistent with G.994.1 methodology. Please let us know if this coding addresses your application and if you can accept it.

It was also noted that your draft 3.0 includes several G.994.1 parameter tables (or portions of tables). We would request that you remove these and reference the appropriate tables in G.994.1.

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G.994.1 parameters for Bonding, Discovery and Aggregation

Table 9.0.2/G.994.1 – Identification field – SPar(1) coding – Octet 3

Bits								
8	7	6	5	4	3	2	1	**SPar(1)s – Octet 3**
X	x	X	x	X	x	x	1	Relative power level/carrier for upstream carrier set A4 (Note)
X	x	X	x	X	x	1	x	Relative power level/carrier for downstream carrier set A4 (Note)
X	x	X	x	X	1	x	x	Relative power level/carrier for upstream carrier set A43c (Note)
X	x	X	x	1	x	x	x	Relative power level/carrier for downstream carrier set A43c (Note)
X	x	X	1	X	x	x	x	Bonding
X	x	1	x	X	x	x	x	Reserved for allocation by the ITU-T
X	1	X	x	X	x	x	x	Reserved for allocation by the ITU-T
X	0	0	0	0	0	0	0	No parameters in this octet

NOTE – The relative power level/carrier reported in a CLR, CL, MP, or MS message indicates the level used during the current G.994.1 session, including the start-up and cleardown procedures. It does not imply any requirements on the transmit power in this or future sessions.

Table 9.37/G.994.1 – Identification field –Bonding
NPar(2) coding

Bits								
8	7	6	5	4	3	2	1	**Bonding NPar(2)s**
X	x	X	x	X	x	x	1	Ethernet bonding
X	x	X	x	X	x	1	x	TDIM bonding
X	x	X	x	X	1	x	x	Reserved for allocation by ITU-T
X	x	X	x	1	x	x	x	Reserved for allocation by ITU-T
X	x	X	1	X	x	x	x	Reserved for allocation by ITU-T
X	x	1	x	X	x	x	x	Reserved for allocation by ITU-T
X	x	0	0	0	0	0	0	No parameters in this octet

Table 9.38/G.994.1 – Identification field – Bonding SPar(2) coding

Bits								
8	7	6	5	4	3	2	1	**Bonding SPar(2)s**
X	x	X	x	X	x	x	1	PMI Aggregation Discovery
X	x	X	x	X	x	1	x	PMI Aggregation
X	x	X	x	X	1	x	x	Reserved for allocation by ITU-T
X	x	x	x	1	x	x	x	Reserved for allocation by ITU-T
X	x	x	1	X	x	x	x	Reserved for allocation by ITU-T
X	x	1	x	X	x	x	x	Reserved for allocation by ITU-T
X	x	0	0	0	0	0	0	No parameters in this octet

Table 9.38.1 - Identification field – Bonding - PMI Aggregation Discovery NPar(3) coding – Octet 1

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 1
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	1	Clear if same
x	x	x	x	x	x	1	x	Reserved for allocation by ITU-T
x	x	x	x	x	1	x	x	Reserved for allocation by ITU-T
x	x	x	x	1	x	x	x	Reserved for allocation by ITU-T
x	x	x	1	x	x	x	x	Reserved for allocation by ITU-T
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T
x	x	0	0	0	0	0	0	No parameters in this octet

Table 9.38.1.1 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding – Octet 2

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 2
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	x	Remote discovery register, bits 47 to 42

Table 9.38.1.2 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding – Octet 3

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 3
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	x	Remote discovery register, bits 41 to 36

Table 9.38.1.3 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding – Octet 4

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 4
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	x	Remote discovery register, bits 35 to 30

Table 9.38.1.4 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding – Octet 5

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 5
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	x	Remote discovery register, bits 29 to 24

Table 9.38.1.5 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding –

Octet 6

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 6
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
X	x	x	x	x	x	x	x	Remote discovery register, bits 23 to 18

Table 9.38.1.6 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding – Octet 7

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 7
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	x	Remote discovery register, bits 17 to 12

Table 9.38.1.7 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding – Octet 8

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 8
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
X	x	x	x	x	x	x	x	Remote discovery register, bits 11 to 6

Table 9.38.1.8 - Identification field – Bonding - PMI Aggregation Discovery - NPar(3) coding – Octet 9

Bits								Bonding PMI Aggregation Discovery NPar(3)s - Octet 9
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	x	Remote discovery register, bits 5 to 0

Table 9.38.2 - Identification field – Bonding - PMI Aggregation - NPar(3) coding – Octet 1

Bits								Bonding PMI Aggregation NPar(3)s - Octet 1
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x					x	x	PMI_Aggregate_register, bits 31-30 (Octet 1, bits 2 and 1)
x	x	x	x	x	1			Reserved for allocation by ITU-T
x	x	x	x	1	x			Reserved for allocation by ITU-T
x	x	x	1	x	x			Reserved for allocation by ITU-T
x	x	1	x	x	x			Reserved for allocation by ITU-T
x	x	0	0	0	0			No parameters in this octet

Editor's note: The above table is different from the current P802.3ah document, which needs to be fixed.

Table 9.38.2.1 - Identification field – Bonding - PMI Aggregation - NPar(3) coding – Octet 2

Bits								Bonding PMI Aggregation NPar(3)s - Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	PMI_Aggregate_register, bits 29 to 24

Table 9.38.2.2 - Identification field – Bonding - PMI Aggregation - NPar(3) coding – Octet 3

Bits								Bonding PMI Aggregation NPar(3)s - Octet 3
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	PMI_Aggregate_register, bits 23 to 18

Table 9.38.2.3 - Identification field – Bonding - PMI Aggregation - NPar(3) coding – Octet 4

Bits								Bonding PMI Aggregation NPar(3)s - Octet 4
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	PMI_Aggregate_register, bits 17 to 12

Table 9.38.2.4 - Identification field – Bonding - PMI Aggregation - NPar(3) coding – Octet 5

Bits								Bonding PMI Aggregation NPar(3)s - Octet 5
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	PMI_Aggregate_register, bits 11 to 6

Table 9.38.2.5 - Identification field – Bonding - PMI Aggregation - NPar(3) coding – Octet 6

Bits								Bonding PMI Aggregation NPar(3)s - Octet 6
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	PMI_Aggregate_register, bits 5 to 0

G.994.1 Variable Silence mode

Table 11.0.4/G.994.1 – Standard Information field – SPar(1) coding – Octet 5

Bits 8	7	6	5	4	3	2	1	SPar(1)s – Octet 5
x	X	x	x	x	x	x	1	G.992.5 - Annex M
x	X	x	x	x	x	1	x	Variable Silence period (Note1)
x	X	x	x	x	1	x	x	Reserved for allocation by the ITU-T
x	X	x	x	1	x	x	x	Reserved for allocation by the ITU-T
x	X	x	1	x	x	x	x	Reserved for allocation by the ITU-T
x	X	1	x	x	x	x	x	Reserved for allocation by the ITU-T
x	1	x	x	x	x	x	x	Reserved for allocation by the ITU-T
x	0	0	0	0	0	0	0	No parameters in this octet

NOTE 1 –Setting the bit to binary ONE in MS message requests a silence period, of 10-640 seconds long, as specified by the Variable Silence period Length field. The station that has invoked the silence period by transmitting MS may terminate the silent period prior to the requested length, by restarting the handshake session (sending activation tones).

Table 11.59/G.994.1 – Standard Information field – Variable Silence NPar(2) coding

Bits 8	7	6	5	4	3	2	1	Variable Silence NPar(2)s
x	x	x	x	x	x	x	x	Variable Silence period Length (n+1) x 10 seconds, n=0 to 63.

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