Base Line Text for IEEE 802.3BT

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Motivation

- To define some basic terminology and text markup for the standard

Terminology used in Current Standard

- The word "Type" associates with the following parameters

  - Class or Category of cabling needed for operation

  - Classification Details and supported/requested Power Levels

- The same thought process is extended for IEEE 802.3bt with the inclusion of the "new MPS"

  New Maintain Power Signature(MPS) – requirement to reduce power consumption while PD is in a mode where it is only sending MPS.

Suggested Terminology

A) Type 1,2 – 2Pair operation will be as per "AT" → Already in the Standard

   May operate as 4Pair with old MPS

B) Type 3– 4-Pair operation, 0-60W[1], new MPS

   - Can use existing Type 2 cable definitions

C) Type 4 – 4-pair operation, 0 - <100W[1], new MPS

   - New cable definition needed (cable type, bundle size etc.,)

[1] – Mentioned power levels are at the PSE PI

Within Type 3 and Type 4, ways to **identify more granular power levels** should be available. For instance a Type 3 PD and PSE should be able to agree on 15W, 30W or 60W. This is a **must** to allow 4-pair 15W or 4-pair 30W only systems in the field which will cover wider market need in a better way, rather than forcing all 4-pair PSE to be 60W or 100W capable.

Higher Level Details

This presentation covers only higher level details.

- 10GBase-T inclusion

- Per 2-pair detection, monitoring and protection on the PSE.

More in-depth parameters etc., needs to be worked out.

Section 33.1.1 - Objectives

- *Compatibility*—Clause 33 utilizes the MDIs of 10BASE-T, 100BASE-TX, ~~and~~ 1000BASE-T **and 10GBASE-T** without modification. Type 1 operation adds no significant requirements to the cabling. Type 2 **and Type 3** operation requires ISO/IEC 11801:1995 Class D or better cabling and a derating of the cabling maximum ambient operating temperature. ~~The clause does not address the operation of 10GBASE- T. For 10GBASE-T operation, the channel model specified in Clause 55 needs to be met without regard to DTE Power via MDI presence or operation~~

NOTE: Once we know the cable details for Type 4 we can add that as well.

Section 33.1.4 – System Parameters

Parameter	Symbol	Units	Type 1 value	Type 2, or Type 3	Additional information
Nominal highest DC current per pair	I_{Cable}	A	0.350	0.600[b]	See Section that covers inter-pair unbalance
Channel maximum DC pair loop resistance	R_{Ch}	Ω	20.0	12.5	
Minimum cable type			UTP per 14.4 and 14.5[a]	Class D	See 33.1.4.1, 33.1.4.2

[a] Class D recommended

[b] In Type 3, 60W operation, the current per 2-pair might be impacted by pair to pair system resistance unbalance. See details in <section that covers pair to pair unbalance>

- **For Type 1 and Type 2 systems,** Two twisted pairs are required to source ICable—one carrying (+ ICable) and one carrying (– ICable), from the perspective of the PI. **All 4 twisted pairs, connected from PSE PI to PD PI are required for Type 3 and Type 4 operation.**

Section 33.1.4.1 Cabling Requirements

- "Type 2 **and Type 3** operation requires Class D, or better, cabling as specified in ISO/IEC 11801:1995 …."

- Under worst-case conditions, Type 2 **and Type 3** operation requires a 10 °C reduction in the maximum ambient operating temperature of the cable when all cable pairs are energized at ICable (see Table 33–1).

NOTE: Type 4 needs to be added once we have cable parameters for that.

Section 33.1.4.2 Channel Requirement

- ~~Type 1 , and Type 2~~, **Any Type** operation requires that the **channel pair** resistance unbalance shall be 3 % or less. **Pair** Resistance unbalance is a measure of the difference between the two conductors of a twisted pair in the 100 Ω balanced.

- **Operation over all 4 twisted pairs requires that the channel pair to pair resistance unbalance shall be x%(TBD) or less. Pair to pair resistance unbalance is a measure of the difference between the equivalent pair resistance of one of the pairs in the cable to any other pair's equivalent resistance.**

NOTE: This can be appended with more information coming out of the End to End Cable Resistance ad-hoc

Section 33.2.3 Pin Assignments

- A PSE shall implement Alternative A, Alternative B, or both. ~~While a PSE may be capable of both Alternative A and Alternative B, PSEs shall not operate both Alternative A and Alternative B on the same link segment simultaneously.~~

Section 33.3.1 PD PI

- The PD shall be capable of accepting power on either **or both** of two sets of PI conductors.

- NOTE—PDs that implement only Mode A or Mode B are specifically not allowed by this standard. ~~PDs that simultaneously require power from both Mode A and Mode B are specifically not allowed by this standard.~~

Thank You

Straw Polls

- <adopt slide x>