P802.3bp Draft D0.1

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P802.3bp Draft D0.1 Status

- Initial (and yet unofficial) draft version D0.1 was generated prior to meeting, containing typical legacy clauses projects update:
  - Clause 1 with definitions and normative references
  - Clause 30 with management objects
  - Clause 45 with MDIO registers
- Two additional clauses are also included:
  - Clause 34 covering introduction to 1000 Mb/s networks, to be extended by adding P802.3bp PHY
  - Clause 98, which is where P802.3bp PHY will be defined in detail, subject to TF decision

P802.3bp Draft D0.1 Outline

- IEEE P802.3bp™/D0.1, XX March 2013
- Introduction
- 1. Introduction
  - 1.3 Normative references
  - 1.4 Definitions
  - 1.5 Abbreviations
- 30. Management
- 34. Introduction to 1000 Mb/s baseband network
  - 34.1 Overview
  - 34.2 State diagrams
  - 34.3 Protocol implementation conformance statement (PICS) proforma
- 45. Management Data Input/Output (MDIO) Interface
- 98. Physical Medium Dependent (PMD) sublayer and baseband medium, type 1000BASE-Tx
  - 98.1 Overview
  - 98.2 Functional specifications
  - 98.3 PMD to MDI electrical specifications
  - 98.4 Characteristics of the 1000BASE-Tx link segment
  - 98.5 MDI specification
  - 98.6 Electrical measurement requirements
  - 98.7 Environmental specifications
  - 98.8 Protocol implementation conformance statement (PICS) proforma for Clause 98, PI

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Clause Status: 1, 30, 45

- Clauses 1, 30, and 45 are placeholders at this time and do not contain any technical material
- Clause 1 will be updated over time to include definitions, abbreviations, and normative references, if any are added by P802.3bp TF.
- Clauses 30 and 45 will be updated when more information about P802.3bp PHY is available, to decide how it needs to be managed remotely (via SNMP – Clause 30 objects) and locally (via MDIO - Clause 45 registers).
- In the future, Clause 30 objects will be rolled into 802.3.1 (when next release is under way) to form a machine readable MIB structure

Clause Status: 34

- Clause 34 covers introduction to 1000 Mb/s baseband network, explaining the overarching architecture of such networks

- P802.3bp will be adding a new 1000 Mb/s capable PHY, and as such, we will need to look at Clause 34 to identify any changes needed in the introductory material to become representative of the new PHY

- Typical changes include modifications of existing material (currently shown) with inserts and strikethroughs, as needed, or insertion of brand new material (new subclauses) as needed. Examples of modifications in P802.3bk are shown on next slides.

Editing example (1)

60 Physical Medium Dependent (PMD) sublayer and medium, type 1000BASE-PX~~10 and 1000BASE-PX20~~ (long wavelength passive optical networks)

Change the title of Clause 60 as shown above:

Change the text of 60.1 as shown below:

60.1 Overview

~~The 1000BASE-PX10 and 1000BASE-PX20 PMD sublayers provide point-to-multipoint (P2MP) 1000BASE-X connections over passive optical networks (PONs) up to at least 10 km and 20 km, respectively and with a typical split ratio of 1:16.~~ The 1000BASE-PX10, 1000BASE-PX20, 1000BASE-PX30, and 1000BASE-PX40 PMD sublayers provide point-to-multipoint (P2MP) 1000BASE-X connections over passive optical networks (PONs). The 1000BASE-PX10 PMD sublayers support a reach of at least 10 km whereas the 1000BASE-PX20, 1000BASE-PX30, and 1000BASE-PX40 PMD sublayers support a reach of at least 20 km. The 1000BASE-PX10 and 1000BASE-PX20 PMD sublayers support a typical split ratio of 1:16. The 1000BASE-PX30 PMD sublayers support a typical split ratio of 1:32. The 1000BASE-PX40 PMD sublayers support a typical split ratio of 1:64. In an Ethernet PON, a single downstream (D) PMD broadcasts to multiple upstream (U) PMDs and receives bursts from each "U" PMD over a single branched topology, single-mode fiber network. The same fibers are used simultaneously in

- In this example, title was modified (removal of specific PHY type names) and part of text of introduction was extended to address new PHY types added in the project.
- Text in underline is being added by the project. Text in strikethrough is being removed by the project.

Editing example (2)

Change Table 60–1 for 1000BASE-PX30-U, 1000BASE-PX30-D, 1000BASE-PX40-U, and 1000BASE-PX40-D PMDs, as shown below:

Table 60–1—PMD types specified in this clause

Description	1000BASE-PX10-U	1000BASE-PX10-D	1000BASE-PX20-U	1000BASE-PX20-D	1000BASE-PX30-U	1000BASE-PX30-D	1000BASE-PX40-U	1000BASE-PX40-D	Unit
Fiber type	IEC 60793–2 B1.1, B1.3 SMF				IEC 60793–2 B1.1, B1.3 SMF, ITU–T G.652, G.657 SMF				
Number of fibers	1				1				
Nominal transmit wavelength	1310	1490	1310	1490	1310	1490	1310	1490	nm
Transmit direction[a]	Upstre~~amS~~	~~Downs treamS~~	Upstre~~amS~~	~~Downs treamS~~	US	DS	US	DS	
Minimum range[b]	0.5 m to 10 km				0.5 m to 20 km				
Maximum channel insertion loss[c]	20	19.5	24	23.5	29		33		dB
Minimum channel insertion loss[d]	5		10		15		18		dB

[a]US stands for Upstream, DS stands for Downstream.
[b]In an FEC enabled link, the minimum range may be increased, or, links with a higher channel insertion loss may be used.
[c]At nominal transmit wavelength.
[d]The differential insertion loss for a link is the difference between the maximum and minimum channel insertion loss, and not applicable to 1000BASE-PX30 and 1000BASE-PX40.

- Changes can also affect tables. Here: new material was added (underlined) and some text was removed (strikethrough)

Clause Status: 98 (I)

- Clause 98 covers the definition of the P802.3bp PHY, including:
  - Functional specifications for Tx, Rx and signal detect
  - PMD to MDI electrical specifications, i.e., how P802.3bp PHY connects to selected media, electrical specifications for Tx and Rx, eye diagrams, and link segment definition for electrical tests
  - Definition of the P802.3bp link segment, including insertion loss, media type, delay, coupling parameters, NEXT, FEXT, etc.

Clause Status: 98 (II)

- Clause 98 covers the definition of the P802.3bp PHY, including:
  - MDI (aka connector) specifications, through definition of the connector performance characteristics. Actual connector may be excluded from specification, giving car manufacturers freedom to use their own connector designs as long as performance characteristics are met.
  - Requirements for Tx, Rx, and link segment measurements, including the necessary reference models
  - Environmental specifications (if any)
  - Protocol implementation conformance statement (PICS) for implementers, collecting specific requirements in a simple format of a table

Suggested Development Order

- First, focus on Clause 98, to cover as much of P802.3bp PHY definition as possible
  - Agree on the target link segment model (how many pairs, what kind of cabling, what specifications must be met, what reach is needed, etc.)
  - Once the link segment is defined, specify Tx and Rx parameters to make sure the given link segment can be supported.
  - The process of defining link segment model and PHY electrical parameters is iterative, to make sure that resulting spec is technically and economically feasible
- Text in C34, C30, and C45 should be added only when we have a good idea on how C98 PHY works and how we need to manage it
- Text in C1 can be added along the way, as new definitions, references and abbreviations become necessary.

What do we do with the draft?

- Draft D0.1 is offered as a starting point for development of the P802.3bp draft, showing what description was used for other 1000 Mb/s capable copper PHY

- It is far from complete, and contains material that is technically incorrect for this project, but helps focus the development on specific areas of interest

- Direct contributions to the draft (in the form of baseline proposals) are welcome (containing specific proposed text, parameters, tables, definitions, etc.) and once agreed to by the P802.3bp TF, they will find their way into next version of the draft

Summary

- Current version of the draft (D0.1) is posted in the private area for preview, to help focus development efforts for the next meeting

- Contributions to Clause 98 are welcome to make the existing text applicable to P802.3bp, removing references to data center environment and addressing the specific requirements from automotive application space

- Format draft review will be started in the future, when the draft is more technical complete and all major technical decisions are taken.