Baseline Proposal – Electrical, RS, PCS, PMA, FEC

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IEEE P802.3cc

Supporters

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Approved Objectives

Adopted Objectives

- Support a MAC data rate of 25 Gb/s
- Support full-duplex operation only
- Preserve the Ethernet frame format utilizing the Ethernet MAC
- Preserve minimum and maximum Frame Size of current IEEE 802.3 standard
- Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent)
- Support optional Energy-Efficient Ethernet operation
- Provide physical layer specification which support 25 Gb/s operation over at least 10 km on SMF.
- Provide physical layer specification which support 25 Gb/s operation over at least 40 km on SMF.
- Provide appropriate support for OTN

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Electrical and Format Baseline Proposal

- This proposal is intended to mirror the electrical interface characteristics of 25GBASE-SR.
  - Assumption: One interface, multiple plug types.
- References are to IEEE 802.3by Draft 3.2.
- A separate proposal should cover optical interfaces.

Use Many Existing Clauses

- 802.3cc only specifies a new PMD, not a new PHY.
  - Thus RS, PCS, PMA, FEC layer changes are considered outside the scope.
  - Use the same MAC, RS, 25GMII as defined in clause 106.
  - Use the same PCS (64/66b) defined in clause 107.
    - NOTE: The Maximum T+R Delay at one end of the link (Clause 107.4) is 143.46 nsec.
  - Use 25GBASE-R PMA as defined in clause 109.
- Require use of KR4 FEC as defined in clause 108.
  - Transcoding to 257b, Code word markers and alignment, etc.
  - Not allowed for 802.3cc : Different FEC, No FEC.

Electrical Interface

- Use 25GAUI Chip-to-chip as defined in Annex 109A.

  - Optional for 802.3by, leave as optional (table 112-1).

- Use 25GAUI Chip-to-module as defined in Annex 109B.

  - Optional for 802.3by, leave as optional (table 112-1).

- 25.78125 GBd NRZ single lane interface.

  - Same as clause 112.2

- { Electrical + Optical } : Less than 10^{-12} BER, or frame loss ratio equivalent.

  - The BER / Frame loss ratio objectives are the same as 802.3by, have been adopted as an objective by 25GE SMF study group.

Description, Management, EEE

- Amend clause 1 – Definitions.
- Amend clause 30 to add appropriate PHY and MAU types.
- Amend Clause 45 to add appropriate MDIO register/bit definitions.
- Amend Clause 78 to add LPI entries for types for 25GBASE-LR/ER.
  - Optional LPI support.
  - Do not provide support for Deep Sleep.
- Amend clause 105 Intro to 25Gb/s Networks.
  - Add 25GBASE-LR and ER, PICS.
- Amend clause 108 RS FEC Sublayer
  - Add 25GBASE-LR & ER to PICS.

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Similar To

- 25GBASE-LR, 25GBASE-ER adopt similar table as clause 112-1

Table 112–1—Physical Layer clauses associated with the 25GBASE-SR PMD

Associated clause	25GBASE-SR
106—RS	Required
106—25GMII[a]	Optional
107—PCS for 25GBASE-R	Required
108—RS-FEC[b]	Required
109—PMA for 25GBASE-R	Required
109A—25GAUI C2C	Optional
109B—25GAUI C2M	Optional
78—Energy Efficient Ethernet	Optional

[a]The 25GMII is an optional interface. However, if the 25GMII is not implemented, a conforming implementation must behave functionally as though the RS and 25GMII were present.
[b]The option to bypass the Clause 108 RS-FEC correction function is not supported.

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New PMD Clause Needed

- Need one new clause for 25GBASE-LR and 25BASE-ER PMD patterned after clause 112.

  - Defines PMD and fiber medium.

  - Soliciting a separate optical parameters baseline proposal.

  - One clause combining both 25GBASE-LR and 25GBASE-ER optics specifications.

OTN

- OTN support is assumed to be unaffected by new 802.3cc PMD specification.
  - Functions in the same manner as 802.3by.