Physical Layer clauses associated with the new 100Gb/s & 400Gb/s PMDs

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Supporters

Approved Objectives (March 2019)

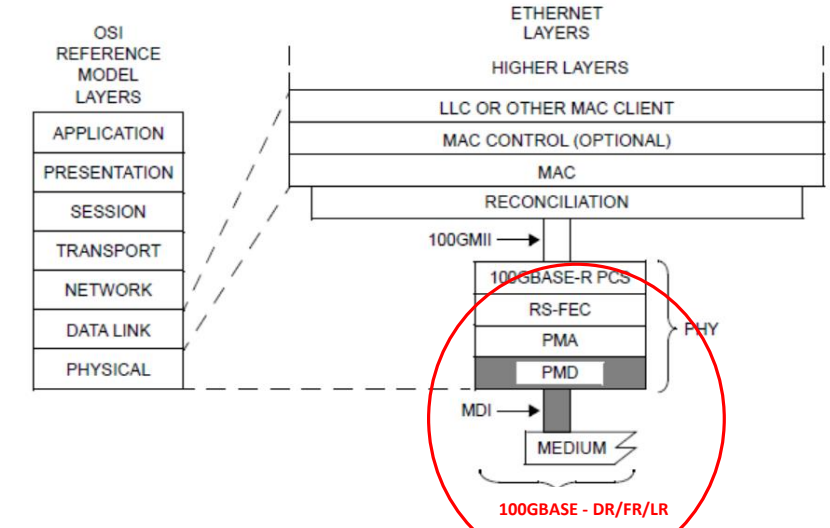
- Support a MAC data rate of 100 Gb/s
- Support a MAC data rate of 400 Gb/s
- Support full-duplex operation only
- Preserve the Ethernet frame format utilizing the Ethernet MAC
- Preserve minimum and maximum FrameSize of current IEEE 802.3 standard
- Provide appropriate support for OTN
- Support a BER of better than or equal to 10-12 at the MAC/PLS service interface (or the frame loss ratio equivalent) for 100 Gb/s operation
- Support a BER of better than or equal to 10-13 at the MAC/PLS service interface (or the frame loss ratio equivalent) for 400 Gb/s operation
- Define a single-wavelength 100 Gb/s PHY for operation over SMF with lengths up to at least 2 km
- Define a single-wavelength 100 Gb/s PHY for operation over SMF with lengths up to at least 10 km
- Define a four-wavelength 400 Gb/s PHY for operation over SMF with lengths up to at least 2 km
- Define a four-wavelength 400 Gb/s PHY for operation over SMF with lengths up to at least 10 km

Compatibility

- Single wavelength, 100 Gb/s PMD is compatible with the existing 100 Gb/s architecture defined in P802.3cd
  - Use existing 100Gb/s MAC, RS, PCS, RS-FEC, PMA and AUI clauses
- Four wavelength, 400 Gb/s PMD is compatible with the existing 400 Gb/s architecture defined in P802.3bs
  - Use existing 400Gb/s MAC, RS, 400GMII Extender, PCS, PMA and AUI clauses

Relation to 802.3 Architecture

100 Gb/s, Clause 140

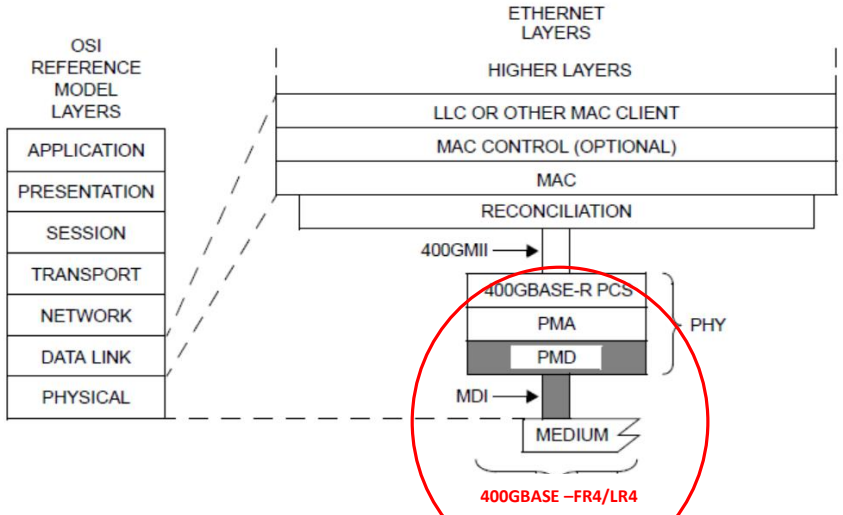


100GMII = 100 Gb/s MEDIA INDEPENDENT INTERFACE
RS-FEC = REED-SOLOMON FORWARD ERROR CORRECTION
LLC = LOGICAL LINK CONTROL
MAC = MEDIA ACCESS CONTROL
MDI = MEDIUM DEPENDENT INTERFACE
PCS = PHYSICAL CODING SUBLAYER

PHY = PHYSICAL LAYER DEVICE
PMA = PHYSICAL MEDIUM ATTACHMENT
PMD = PHYSICAL MEDIUM DEPENDENT

DR = PMD FOR SINGLE-MODE FIBER — 500 m
FR = PMD FOR SINGLE-MODE FIBER – 2 km
LR = PMD FOR SINGLE-MODE FIBER – 10 km

400 Gb/s, Clause 200*



400GMII = 400 Gb/s MEDIA INDEPENDENT INTERFACE
LLC = LOGICAL LINK CONTROL
MAC = MEDIA ACCESS CONTROL
MDI = MEDIUM DEPENDENT INTERFACE
PCS = PHYSICAL CODING SUBLAYER

PHY = PHYSICAL LAYER DEVICE
PMA = PHYSICAL MEDIUM ATTACHMENT
PMD = PHYSICAL MEDIUM DEPENDENT

FR4 = PMD FOR SINGLE-MODE FIBER – 2 km
LR4 = PMD FOR SINGLE-MODE FIBER – 10 km

**Clause 200 = Placeholder numbering for new clause (DR4 & FR4/LR4 have different MDIs)*

Tables

Table 140—1: Physical Layer clauses associated with the 100GBASE-DR/FR/LR PMDs

Associated clause	100GBASE-DR 100GBASE-FR 100GBASE-LR
81—RS	Required
81—100GMII[1]	Optional
82—PCS	Required
83—100GBASE-R PMA	Optional
91—RS-FEC	Required
83A—CAUI-10 C2C	Optional
83B—CAUI-10 C2M	Optional
83D—CAUI-4 C2C	Optional
83E—CAUI-4 C2M	Optional
135—100GBASE-P PMA	Required
135D—100GAUI-4 C2C	Optional
135E—100GAUI-4 C2M	Optional
135F—100GAUI-2 C2C	Optional
135G—100GAUI-2 C2M	Optional
78—Energy Efficient Ethernet	Optional

[1]The 100GMII is an optional interface. However, if the 100GMII is not implemented, a conforming implementation must behave functionally as though the RS and 100GMII were present.

Table 200—1: Physical Layer clauses associated with the 400GBASE-FR4/LR4 PMDs

Associated clause	400GBASE-FR4 400GBASE-LR4
117—RS	Required
117—400GMII	Optional
118—400GMII Extender	Optional
119—PCS for 400GBASE-R	Required
120—PMA for 400GBASE-R	Required
120B—Chip-to-chip 400GAUI-16	Optional
120C—Chip-to-module 400GAUI-16	Optional
120D—Chip-to-chip 400GAUI-8	Optional
120E—Chip-to-module 400GAUI-8	Optional
78—Energy Efficient Ethernet	Optional

Thank You.