Copper MDI connector guidance

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Background

Cl **179C** *SC* **179C.1** *P* **921** *L* **3** # 86

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **R** *MDI connectors (CG)*

"When an MDI connector is not fully utilized the lower PMD numbers in Table 179C–2 should be used"

The MDI is part of the PHY so "not fully utilized" means the host does not have transmit and receiver functions for all lanes of the MDI. This is an unlikely situation, and even if it happens, following the recommendation does not guarantee interoperability, since in most cases the link partner needs to be configured accordingly.

Instead, it would be helpful for readers to know that in some cases, such as breakout cables, the combination of PMDs types on both sides of the cable can require management to create matching configurations

SuggestedRemedy

Delete the quoted sentence.
Add the following informative note:
NOTE—The PMD types on both sides of the cable assembly need to match. When the MDI is used for multiple PMDs or for PMDs with lower number of lanes than the MDI supports, appropriate configuration is required. The means for selecting the appropriate configuration are beyond the scope of this standard.

Response *Response Status* **C**

REJECT.

This comment does not apply to the substantive changes between IEEE P802.3dj D2.2 and D2.3 or the unsatisfied negative comments from previous drafts. Hence it is not within the scope of the recirculation ballot.

The following contribution was reviewed by the CRG:
https://www.ieee802.org/3/dj/public/26_01/ran_3dj_03a_2601.pdf

There was some agreement that changes to the wording in 179C would improve the quality of the draft. However, there was no agreement on specific changes. Further work on this topic is required.

There was no consensus to make any of the proposed changes at this time.

- Following comment #86 against D2.3 and related presentation ran_3dj_03a_2601.
- A consensus building group met on Feb 17th, 2026 to discuss the topic and propose changes for D3.1.

Why a note is needed

- An MDI connector can be used as one or more MDIs.
- Implementations can use an MDI connector with PHY capabilities for one or more MDIs that the connector can be used for.
- If more than one capability is supported, interoperability with a link partner requires a correct configuration.
- Example:
  - Host A uses an OSFP connector, with PMA/PCS/MAC support for 8×200GBASE-CR1, 4×400GBASE-CR2, 2×800GBASE-CR4, and 1x1.6TBASE-CR8.
  - Host B also uses an OSFP connector but with only 8×200GBASE-CR1 capability (that is, no 400GBASE-CR2/800GBASE-CR4/1.6TBASE-R support).
  - For interoperability, host A needs to be configured as 8×200GBASE-CR1.

Doesn’t AN handle that?

- AN is specified to operate only on lane 0 of a multi-lane PHY…

73.5.1 DME electrical specifications

Change the second paragraph of 73.5.1 (as amended by IEEE Std 802.3ck-2022) as follows:

For any multi-lane PHY, DME pages shall be transmitted only on lane 0. The transmitters on other lanes should be disabled as specified in 71.6.7, 84.7.7, 85.7.7, 92.7.7, 93.7.7, 94.3.6.7, 136.8.7, 137.8.7, 162.8.7, ~~or~~ 163.8.7, 178.8.7, or 179.8.7.

- In practice, AN is often (if not always) used with a single advertised ability, matching a preconfigured combination of PHY sublayers (from PCS to PMD) and possibly MAC and upper layers.
  - Reconfiguration is complicated, and is not done as part of AN.

Partially populated MDI connectors

- A host may use an MDI connector but implement MDIs (and PHYs) only on some of the connector signals.
- If different hosts have different choice of connector signals, they cannot interoperate.
- Example:
  - Host A uses a QSFP connector, but has only 1×200GBASE-CR1 ability. It uses 1 of the 4 lanes, with signals SL0n/p and DL0n/p.
  - Host B uses the same connector and has the same ability but uses signals SL1n/p and DL1n/p.
  - The two host cannot interoperate (unless a non-standard cable assembly is used).
- The choice of connector signals in such cases needs to be normative.

Recommendations

- In 179.12 “MDI specifications”, add the following informative note

  NOTE—A host may support multiple combinations of PHY types utilizing the same MDI connector, as described in Annex 179C. If so, it must be configured appropriately for interoperability with the connected link partners. Selecting the appropriate configuration of a host might require knowledge of the abilities of the link partners.

- In 179C.1, change the last sentence in the paragraph preceding Table 179C-2 as follows:

  When not all connector signals in an MDI connector ~~is not fully utilized~~ are physically connected to PMD signals, the connector signals corresponding to lower PMD numbers in Table 179C–2 ~~should~~ shall be used.

That’s all!

Questions?