

Proposed TDD Distinct Identity Statement

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Introduction

- ❑ **Per previous discussion, the distinct identity of a PHY should be intrinsic to that technology, visible to the end user in a way that could influence why a customer would or would not choose it**
 - ❑ It should not be a matter of degree by which the PHY performance would be “better” in some sense when both satisfy the objectives
 - ❑ It should not be a technology distinction like TDD vs. ACT, since that is effectively invisible to the end user in terms of choosing which to use
- ❑ **MAC rates and media options are a common form of distinct identity, but both ACT and TDD are the same in these regards**
- ❑ **The distinct identity proposed in this presentation is inherently unique to TDD**

Proposed TDD Distinct Identity Statement

- ❑ **“Optimized to allow a single, flexible PHY with multiple rate options.”**
- ❑ **In particular, the flexibility has two aspects:**
 - ❑ Commonality between high-speed and low-speed PHY types, which allows ports with a single PHY supporting either direction (i.e., port reversibility)
 - ❑ Enabling the use of a single high-speed PHY that can operate at different rates

TDD Distinct Identity Specific Aspects

- **The same TDD cycle is used for all configurations**
- **Both the high-speed and low-speed PHYs support PAM2 3.0 Gsps, since it is required for the symmetric link training mode**
- **All TDD ports use PAM2 3.0 Gsps for the low-speed path, independent of which high-speed option (2.5G, 5G, 10G) they support**
- **For 2.5 Gbps downstream, the high-speed PHY is identical to the low-speed PHY**
 - Only the burst duration is different
- **The high-speed 5 Gbps and 10 Gbps PHYs use the same 6.0 Gsps rate (PAM2 at 5G and PAM4 at 10G), which is exactly twice the 3.0 Gsps rate used for the 2.5 Gbps PHY**
- **FEC commonality:**
 - The same FEC is used for all high-speed PHYs, all of which have an identical FEC block period
 - The high-speed PHY FEC is a shortened version of the low-speed PHY FEC, allowing FEC engine reuse

Visibility & Potential Value to the End User

- ❑ Enables universal ports on switch chips, including changing directions.
- ❑ Enables universal ECU ports to interface with different imager (or display) types.
- ❑ Allows reducing the number of part SKUs that OEMs and Tier1s have to manage.
- ❑ Reduces the silicon development investment needed by the industry.
- ❑ Enables novel system architectures and flexibility that would otherwise require multiple back-to-back devices.

Draft Proposed New Objective

The proposed distinct identity is fully compatible with the existing PAR and CSD. However, it is best to capture it in a new objective.

□ “Define an electrical PHY to support up to 10 Gbps data rate point-to-point operation in one direction, and up to 100 Mbps point-to-point operation in the other direction with the direction of asymmetry and high-speed rate determined at link startup over the defined [balanced pair / unbalanced coaxial] link segment.”

□ Notes:

- Not all P802.3dm PHYs need to support this objective. It is only required that at least one of the P802.3dm PHY types is capable of supporting it.
- The “up to 10 Gbps” is intended to apply to 2.5, 5 and 10 Gbps or any combination of one or more of these rates, since they are all elaborated in the general objectives.

Conclusions

❑ In summary, the propose distinct identity:

- ❑ Is inherently unique to TDD, especially with respect to enabling link reversibility.**
 - ❑ TDD does not require a separate PHY for the low-speed TX/RX signal**
- ❑ Has observable tangible potential value to end users in their PHY type selection.**
- ❑ Is fully consistent with the existing P802.3dm PAR and CSD, so it only needs a new objective statement.**

❑ Accordingly, this proposal satisfies the 802.3 distinct identity requirements.

❑ We propose adopting this distinct identity for TDD in P802.3dm, which would allow both the TDD and ACT PHY technology to be included in the same P802.3dm baseline for Working Group approval

Thank You