DTE Comments Summary on 802.3da D3.0

G. Zimmerman / CME Consulting (ADI, APL Group, Cisco, Infineon, Onsemi, Sony)

D. Law / HPE

9/16/2025

“DTE” comment group - summary

- These comments are meant to address the use of DTE in the draft:
  - DTE is defined differently in 802.3 than in ITU and other communications standards (for historical reasons… other standards have DTE & DCE, 802.3 is peer-to-peer and just has DTE)
  - Avoiding jargon – especially when it has multiple meanings - will improve understandability
  - Many of these comments relate to LLDP management – which is a logical entity, and doesn’t really know about physical devices
  - The element MPI pair index is key to what is associated with a management entity (DTE in draft) but isn’t defined in clause 79 where it is first (and mainly) used.

HENCE, in general:

- Eliminate “DTE” where it isn’t essential
- “mixing segment” with LLDP refers to “nearest bridge group”, and
- DTE with respect to LLDP refers to the “MAC client” or similar related LLDP unit **– *SEE NEXT SLIDE…***

Modification (considering 802.1ab)

- Clause 6 'Principles of operation' of IEEE Std 802.1AB-2016 'Station and Media Access Control Connectivity Discovery' states: 'LLDP is a link layer protocol that allows an IEEE 802 LAN station to advertise the capabilities and current status of the system associated with an MSAP.' (MSAP, a 'Media access control service access point', is a MAC service interface in IEEE 802.3 terminology.)
- Clause 6 of 802.1ab continues: 'The MSAP provides the MAC service to an LLC Entity, and that LLC Entity provides an LSAP to an LLDP agent that transmits and receives information to and from the LLDP agents of other stations attached to the same LAN.'.
  - From an IEEE 802.3 perspective, this seems to mean that the MAC service interface provides the MAC service to a MAC Client, an LLC Entity, and this in turn provides a link service access point (LSAP) to the LLDP agent that transmits and receives information to and from the LLDP agents of other stations attached to the same LAN.

➢ ***Based on this, it seems that LLDP is not a MAC client, strictly speaking.***

- ***THEREFORE***, rather than include the definition of the collection of MPIs, such as '... MAC client to advertise capabilities and status for each of its associated MPSE MPIs ...', in each TLV description, a term should be defined for the collection of MPIs, and this should be used in the TLV descriptions instead.

New definition: MPI Group

- To simplify, we add the definition of MPI Group as follows:
- **MPI Group:** One or more MPSE(s) or one or more MPD(s) that use a single LLDP MAC service access point (MSAP), associated with a single TCI, to advertise capabilities and status using LLDP.
  - An MPI Group is the grouping of a TCI and an MPI, or a TCI and MPI(s), where the MPI(s) in the group is/are managed using LLDP, communicated through use the MAC service access point (MSAP) associated with the TCI in group. Note that an MPI, the mechanical and electrical interface, (see IEEE P802.3da subclause 1.4.405b) can't really advertise capabilities and status using LLDP. Only the MPSE or MPD associated with an MPI can do that.

As an example, this changes the 1st sentence of 79.3.10 to read:

- The MPoE MPSE Status TLV allows a station to advertise the capabilities and current status for each of the MPSEs in an MPI Group to other stations on the same nearest bridge group.

MPoE Status TLVs (MSPE, MPD, Power Alloc) (79.3.10, 79.3.11 & 79.3.12)

- Replace DTE(s) by “station”(s) or by “MPI Group” as appropriate
- Change “associated (MPSE/MPD) MPIs” to (MPSE/MPD) “MPIs in an MPI Group”
- Replace mixing segment by “nearest bridge group”
- Delete requirement in clause 79 stating a DTE shall not mix MPSE & MPD MPIs (this is stated and belongs in clause 189)

79.3.10 MPoE MPSE Status TLV

The MPoE MPSE Status TLV allows ~~DTEs~~ to advertise capabilities and status for each of its associated MPSE MPIs to other ~~DTEs~~ on the ~~mixing segment~~. ~~A DTE shall have either MPSE or MPD MPIs, not a mix of both~~. ~~DTE are either MPSE or MPD MPIs.~~ The TLV consists of a fixed element (Table 79–22b) reporting the number of MPSE entries included in the TLV, followed by an array of MPSE entries (Table 79–22c). The MPSE entries are sorted by MPI pair index.

MPI pair index

- Text currently exists in 189.1.3.1 (P134)
- Text is adapted to remove DTE and inserted in 79.3.10 before the use in TLV status elements. It is referenced in 79.3.11 for the MPD.
- **Note:** This proposal is updated version of the proposal in the comment database

The set of MPSE MPIs in a MPI Group is identified within LLDP MPoE TLVs using an MPI pair index. MPI pair index has the following semantics:
Type: 8 bit unsigned integer

Values:

0: is the TCI associated with the MPI Group

>0: the MPI is physically separate from the TCI associated with the MPI Group

The set of MPIs in an MPI Group shall meet the following criteria:

a) MPIs in a given MPI Group are either all MPSEs, or all MPDs.

b) Unless stated otherwise, all other MPI attributes for a given MPI Group are independent. This includes:

MPI type
MPI capabilities and status
MPI requested and granted power

Change the PICS item MPSE3 Value/comment in subclause 79.5.14 to 'Table of per MPI Group entries, see Table 79-22c'.

MPI pair index – reference in 79.3.11

- Add:
  - MPIs in a MPI Group are identified by their MPI pair index, as defined in 79.3.10.

Usage of DTE in tables

- Table 79-22d (MPSE), 79-22m (MPD):
  - MPI pair index “within DTE” – MPI pair index is now defined, and it is defined relative to the MAC client.
    - DELETE “within DTE”
- Table 79-22y (Power Allocated)
  - “DTE MAC” – there is only the MAC, DTE adds no clarification, delete DTE
  - “DTE MPI pair index” – see above, delete DTE

Clause 189 – 189.1 Overview

- 189.1 Overview refers to “association” of an MPI “with a DTE”…
  - This description refers to both the physical interface AND to management

Ethernet Physical Layer device with an interface to both the power and data using only a single balanced pair of conductors as a shared medium. MPoE interfaces (MPIs) are normally associated with a DTE (e.g., a 10BASE-T1M TCI). A given DTE may have multiple associated MPIs (see 189.1.3). MPIs may also operate without an associated DTE (see 189.1.3).

- Replace the last 2 sentences with:
  - The Multidrop Power Interface (MPI) serves as the mechanical and electrical interface between the MPSE or MPD and the power transmission medium, as defined in 1.4.484. An MPI is normally associated with an MPI Group. The MPI may be the TCI associated with the MPI Group, or the MPI may be physically separate from the TCI associated with the MPI Group. A given MPI Group may have multiple associated MPIs (see 189.1.3). MPIs may also operate without an associated MPI Group (see 189.1.3).

189.1.1 Compatibility (with PHYs)

- 189.1.1: Rewrite for clarity – and remove DTE:
  - Replace with: MPIs that are also TCIs can require additional specifications, including those found in the relevant PHY clause (e.g., 188.9), and some found within this clause (see 189.6.3).

189.1.1 Compatibility considerations

Compliant implementations of MPD and MPSE systems are defined as compatible at their respective Multidrop Power Interfaces (MPIs) when used in accordance with the restrictions of this clause. Designers are free to implement circuitry within the MPD and MPSE in an application-dependent manner provided that the respective MPI specifications are satisfied. ~~DTEs that incorporate~~ MPIs that are also TCIs ~~are compatible with their respective Physical Layer standards. Such compatibility~~ ~~may~~ require additional specifications found within this clause (see 189.6.3).

189.1.2 Architecture

- Doesn't need to talk about "positioning", or co-location. An example is shown in the figure…
  - Change text to describe the figure rather… "Figure 189-1 shows the MPSE… positioned within separate DTEs"
  - Delete statement about "An MPSE or MPD may or may not be co-located with a DTE" – it says nothing….
- Reference to management "by associated DTEs" isn't correct and isn't needed. Management is described "via LLDP TLVs" – delete "by associated DTEs".

189.1.2 Relationship of MPoE to the IEEE 802.3 architecture

MPoE is an optional power entity to be used in conjunction with supported multidrop single pair Ethernet Physical Layers. Figure 189–1 depicts the positioning of MPoE. The MPSE and MPD are positioned within separate DTEs. The power is applied to the Multidrop Power Interface (MPI) (see 1.4.405b). Compliance is specified at the MPI (see Figure 189–1). ~~An MPSE or MPD may or may not be co-located with a DTE, and~~ the power may be provided over the same pair as the data or over a dedicated pair with power only. The interface of the power entity to the medium is the MPI, with connection points MP1 and MP2 to the power trunk. When power and data are carried over the same pair, the MPI and the TCI are the same connection to the medium and the requirements for the PHY's TCI also apply to the MPI (e.g., see 188.9). However, when power is carried over conductors that are not also carrying data, the MPI may be separate from the TCI and the related TCI requirements do not apply. MPoE power entities may be managed ~~by associated DTEs~~ via LLDP TLVs (see 79.3.10 through 79.3.12) or layer management (see 30.17), regardless of whether the data and power are on the same or separate pairs.

189.1.3 – MPI Groups

- Repurpose:
  - Change 189.1.3 title to “MPI Groups”, change figure 189-2 to “Example MPI Groups”

- 189.1.3.1 change title to 'MPIs managed using LLDP’ and replace text:
  - A LLDP MSAP, associated with a single TCI, may be used by zero, one, or more than one MPSE(s) or MPD(s) to advertise their capabilities and status using LLDP as part of an MPI Group. MPIs in a given MPI Group shall be either all MPSEs or all MPDs. The set of MPIs in an MPI Group is identified using an MPI pair index (see 79.3.10 and 79.3.11). LLDP management for MPoE assumes that no power bus spans more than one nearest bridge group. Implementers should confine LLDP-managed power buses to a single nearest bridge group to avoid confusion.
    - (Change PICS item MPI-CONST in subclause 189.8.4.2 to refer to 189.1.4, change Feature to 'An MPI Group is either all MPSEs or all MPDs', change Value/Comment to ‘An MPI Group shall be either all MPSEs or all MPDs’.)

Figure 189-2

- Change title of Figure to “Example MPI Groups”
- Split “PHY” into “MAC client | MAC | PHY” (in each instance)
- Change label “DTE” to “MPI Group”, add label “MPI Group” below 2 lower boxes

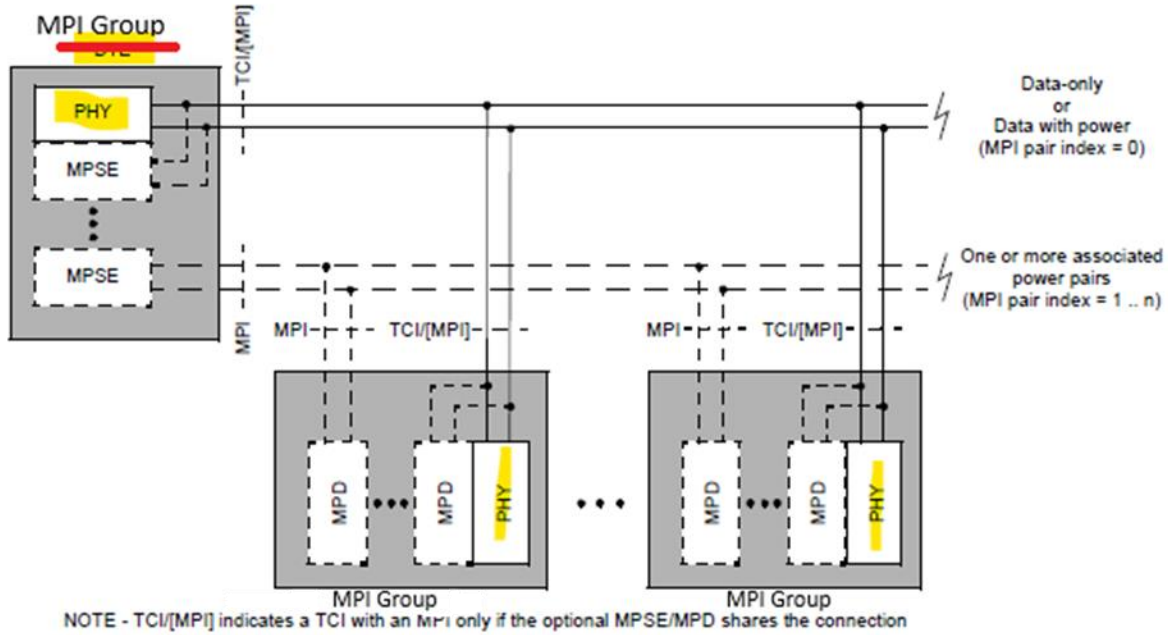


Figure 189-2 Example MPI Groups

Miscellaneous edits (1)

- 189.2 Mixing segment: DTE here refers to the physical device:
  - "attached DTE", and "Each DTE includes mated connectors"
  - Replace with "device"
- 189.4.3 & 189.5.2: Figures include "DTE" in label, that adds no information…

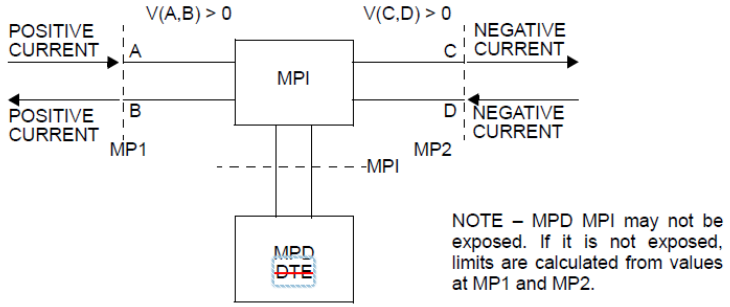


Figure 189–6—Current at an MPD MPI

Miscellaneous edits (2)

- 189.6.1 MPI return loss – DTE refers to the loading (or simulated) :
  - "DTE or simulated DTE load present at the MPI"
  - Replace with "device or simulated device load present at the MPI"
- PICS:
  - Remove DTE_ABSNT and DTE_SHRD as these are not used
  - Adjust PICS for DTE_NSHRD and rename to NODATA in 189.8.3 and 189.8.4.2 to reflect that these are for when the MPI uses different conductors than the data interface.

Edits to remove DTE from clause 188: less crucial, less confusing…

- Most references are in 188.8 and 188.9 where they refer to a physical unit for connections
  - Replace DTE with “station” in most places in 188.8 and 188.9.1.x
    - 188.8 P112 L15, L21-25; P113 L4;
    - 188.8.1 P114 L6, 9, 10 (5x total); 188.8.2 P115 L5 & 8; 188.8.3 P116 L3, 4, 10;
    - 188.8.5 P117 L25 & 26; 188.8.6 P117 L33 (2x); 188.9 P118 L22, 25, 28, 30, 31, 34, 35;
    - 188.9.1 P119 L3 (2x), 188.9.1.2 P119 L26 & 27; 188.9.1.3 P119 L42 (2x); 188.9.1.5 P120 L8
  - 188.8 (P112 L26) Delete DTE ("DTE loads") at line 26.
  - 188.9 (P117 L45) - replace DTE in text with “PHY” and in Figure 188-21 (P118)
    - Here it isn’t the station & TCI or TC1 & TC2 might be connectors on the station itself, and similarly on Figure 188-21.

Examples of replaced or deleted DTE text…

188.8 Mixing segment characteristics

The 10BASE-T1M PHY is specified to operate over media that meet the requirements specified in this subclause. The 10BASE-T1M mixing segment (1.4.403) is a single balanced pair of conductors that may have more than two DTEs attached. The Trunk Connection Interface (TCI) (1.4.558a) is an MDI for the shared transmission medium (single balanced pair of conductors). The cable media is referred to as "trunk" cable.

representative ~~DTE~~ loads attached. Like the MDI, the specification of the TCI is not a device, but rather a pair of interface planes.

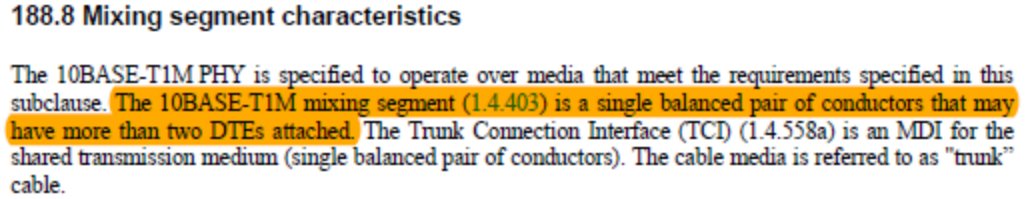
188.8.1 Insertion loss

Mixing segment insertion loss includes any TCI insertion loss. See 188.9.1.1 for specification of TCI insertion loss.

The mixing segment insertion loss, with DTEs or representative simulated DTE loads attached, shall meet the values determined using Equation (188–3), measured between edge termination reference planes by substituting the measurement probes for the edge terminators. The reference impedance is 100 Ω. If the mixing segment includes TCI connectors which are specified to use a simulated DTE load, this requirement is met with simulated DTE loads or DTE attached.

Edits to remove DTE from clause 188: less crucial, less confusing… (2)

- Delete or replace DTE in other instances:
  - Delete “within the DTE” at 188.6.2.1 (change anything).
  - 188.6.6.2 (P111 L30, in Figure 188-16 - Labels in "Transmit" and "Receive" blocks - suggest change to Transmitter & Receiver and delete DTE in both places
  - 188.10.3 (P121 L50) - replace DTE with TCI. (The wiring connection to the TCI seems the correct usage)
  - 188.10.3 (P122 L4) - delete "of a DTE" (it adds nothing essential) Update PICS (MXS1, MXS6, MXS7, TCI1, TCI2) in the "Value/Comment" field according to the changes made above.



188.8 Mixing segment characteristics

The 10BASE-T1M PHY is specified to operate over media that meet the requirements specified in this subclause. The 10BASE-T1M mixing segment (1.4.403) is a single balanced pair of conductors that may have more than two DTEs attached. The Trunk Connection Interface (TCI) (1.4.558a) is an MDI for the shared transmission medium (single balanced pair of conductors). The cable media is referred to as "trunk" cable.

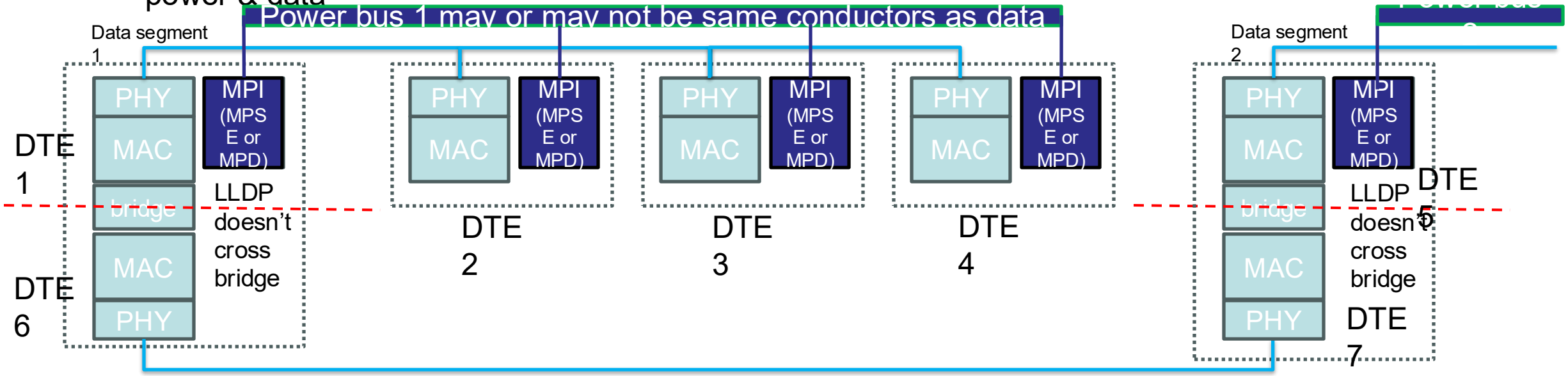
Thank You

(BACKUP)

LLDP AND MPOE TOPOLOGIES: NEAREST BRIDGE GROUPS & MIXING

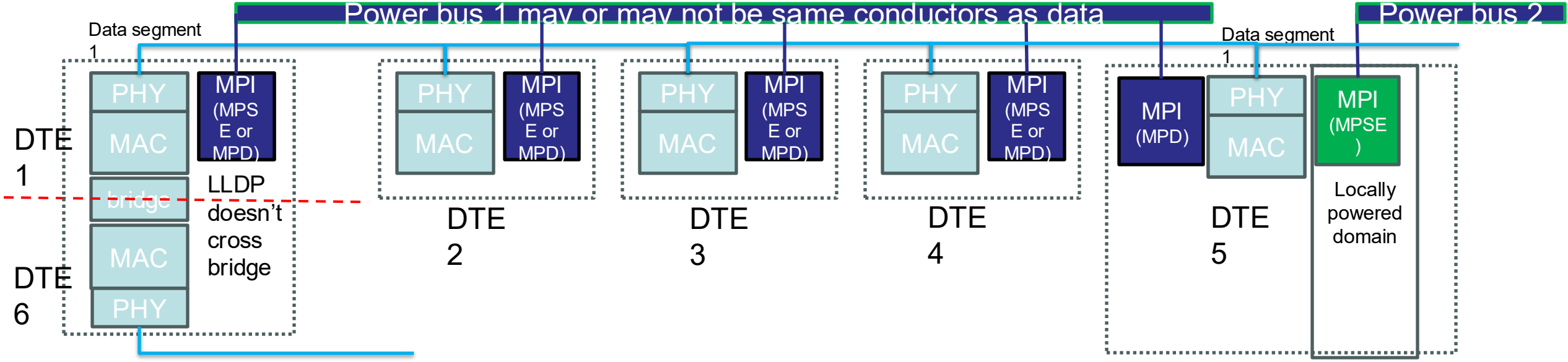
LLDP management rationale for MPoE

- LLDP doesn't cross bridges (nearest bridge group address)
  - Note – DTE used in the 802.3 sense, synonymous with a MAC instance
- Power and data can be managed on a local mixing segment
  - Management relies on this so that there is 1 power budget per LLDP domain
- Topologies as below work fine, both with same conductors as data or different conductors for power & data



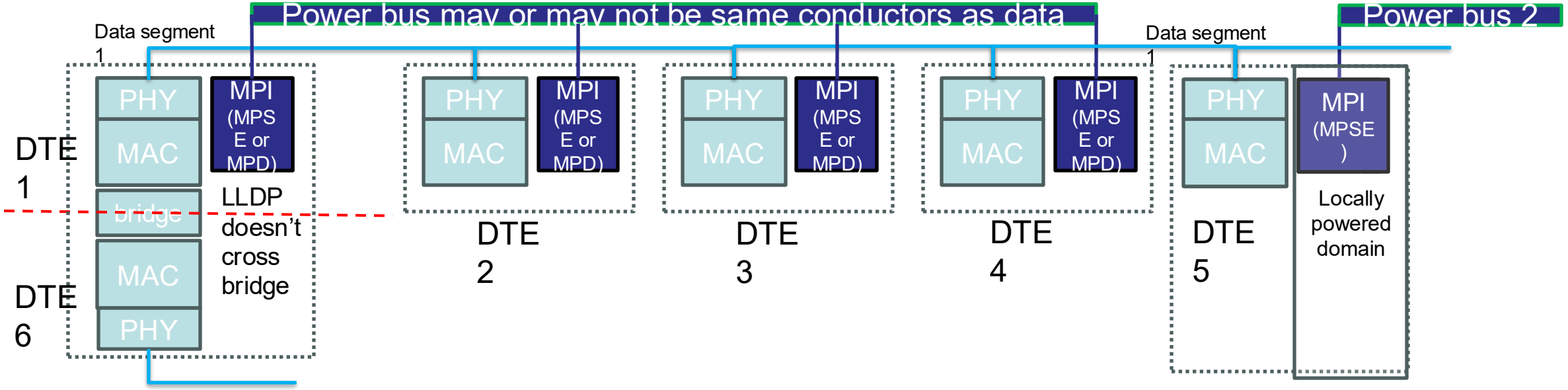
MPSE and MPD on same device

- One of the 2 power busses does not share same conductors as data
  - Shown as power bus 2 here
- MPD & MPSE on DTE5 are in same LLDP bridge group
  - This means LLDP management for power bus 2 is the same as power bus 1.
- Confusion because 2 power busses w/2 independent budgets are in the same LLDP domain



Avoiding MPSE & MPD on a DTE doesn't fix it

- One of the 2 power busses does not share same conductors as data
  - shown as power bus 2 here
- MPD & MPSE on DTE5 are in same LLDP domain as MPSE on power bus 1
  - Management confusion because 2 power busses w/ 2 separate MPSE power budgets are in the same LLDP bridge group



It gets worse – single power segment

- If the data segment stops, management by the nearest bridge group fails to track with the power segments…
- SO: advise users not to do this…