Adding CR Host Loss Class bits to AN73, Comment #42

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Auto-negotiation

- Clause 73 AN (aka AN73) is used only with electrical PMDs (“CR” and “KR”)
- 3dj introduces the concept of multiple CR host loss classifications to reallocate loss budget where it is not being used
  - Host-High
  - Host-Nominal
  - Host-Low

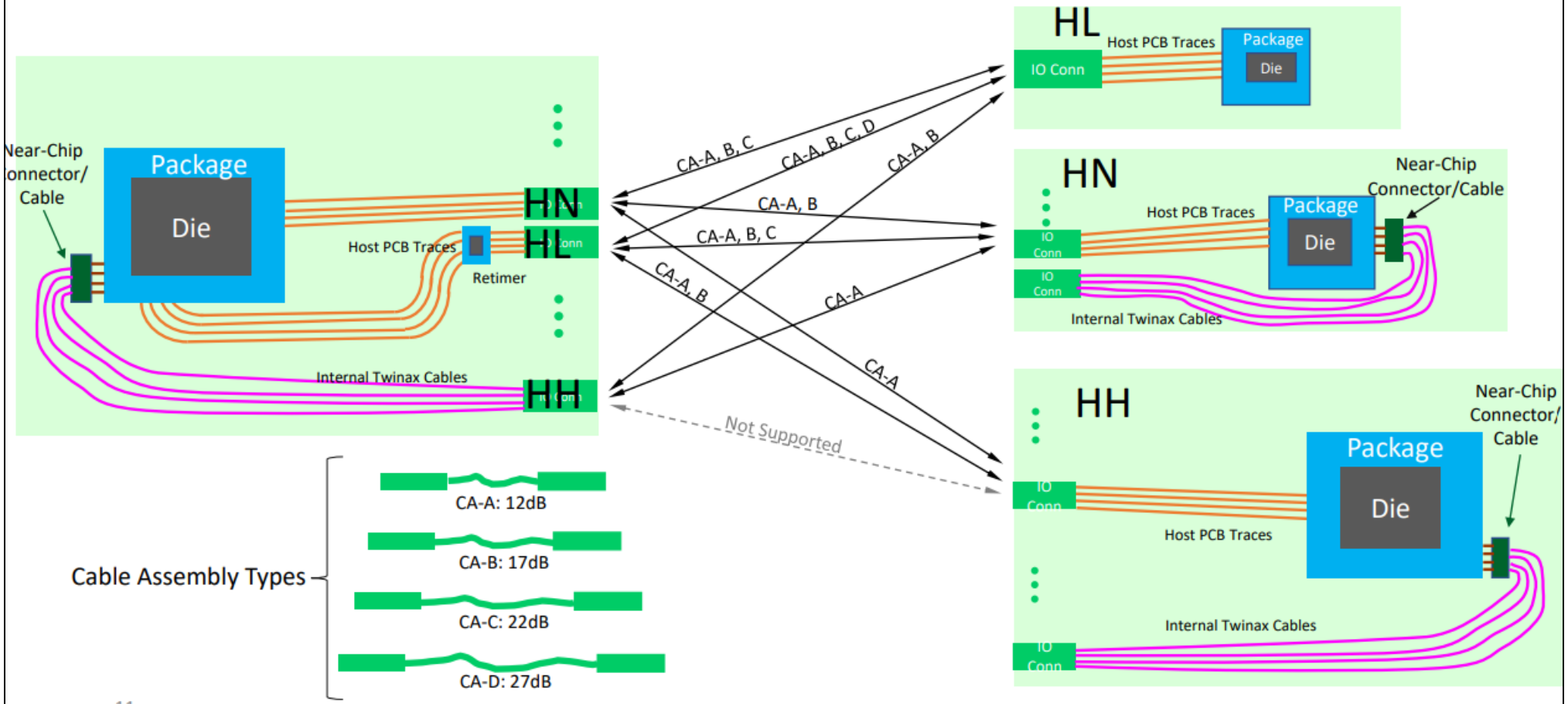
Valid Host-Cable Combinations

- Not all combinations of *cable assembly* class are supported with all combinations of *host* classes
- E.g. CA-D with HH on transmitter side and HH on receiver side is not a valid combination

Table 179–15—Cable assembly class and host class valid combinations

Cable assembly class	Host classes, transmitter side	Host classes, receiver side	Number of combinations
CA-A	HN or HL	HL, HN, or HH	6
	HH	HL or HN	2
CA-B	HL	HL, HN, or HH	3
	HN	HL or HN	2
	HH	HL	1
CA-C	HL	HL or HN	2
	HN	HL	1
CA-D	HL	HL	1

Flexible Host Architecture

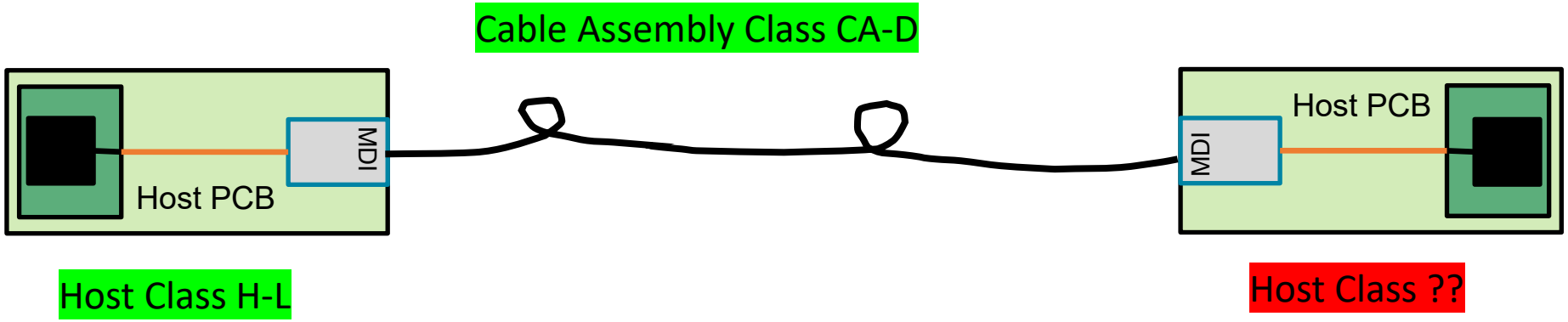


https://www.ieee802.org/3/dj/public/23_11/tracy_3dj_01a_2311.pdf

Knowing All the Parts

- For interoperability, a host needs to know the host loss class of the partner to determine if the two host end points can support the inserted cable assembly
- The local CR host knows its host class type by design
- The local host also can access the cable assembly class via management means such as CMIS contents inside the plug end.
  - Available by plug end EEPROM memory map
- However, the partner's host class remains elusive in "non-engineered link environments"
  - On the other hand, engineered links should have all of the information

Example



- Is this a valid combination of hosts and cable assembly?

Proposal (1/2)

- Define two new bits in the Annex 73A Extended FEC and Technology Ability Message code link codeword in location D42:43 (EA26:EA27) as "CR Host Class for 200 Gb/s per lane PHYs".
- Abbreviated EH0:1
  - D42 D43 Class
  - 0 0 Unspecified
  - 0 1 Host Nominal HN
  - 1 0 Host Low HL
  - 1 1 Host High HH

Table 73A–1a—Extended Technology Ability[a]

Bit	Technology
EA0	200GBASE-KR1 or 200GBASE-CR1
EA1	400GBASE-KR2 or 400GBASE-CR2
EA2	800GBASE-KR4 or 800GBASE-CR4
EA3	1.6TBASE-KR8 or 1.6TBASE-CR8
EA4 through EA27	Reserved
EF0 through EF3	Reserved for extended FEC ability

[a] If the Extended Technology Ability Field is not received or not sent, then its effective value is all zeros.

Proposal (2/2)

- The local host encodes its host class in bits EH0:1 of the outgoing AN73 extended technology ability field

Summary

- For interoperability, more information is needed to know if the CR hosts and cable assembly is a valid combination
- A proposal for Annex 73A is provided to make the missing information available
  - The host on the other end now has the enough information to know if the hosts + cable assembly is a valid combination
- Applies only to 200 Gbps/lane CR PHY types