

# SINGLE VS DUAL PHY DISCUSSION FOR 25G-BASE-CR



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- **Cao Li, Accelink**
- **Dan Dove, Dove Networking Solutions**
- **Dave Chalupsky, Intel**
- **Eric Baden, Broadcom**
- **Greg McSorley, Amphenol**
- **Jiang Yi, Accelink**
- **Jon Lewis, Dell**
- **Jonathan King, Finisar**
- **Kent Lusted, Intel**
- **Mark Gustlin, Xilinx**
- **Oded Wertheim, Mellanox**
- **Raj Hegde, Broadcom**
- **Scott Kipp, Brocade**
- **Vittal Subramani, Dell**
- **Gary Nicholl, Cisco**
- **Matt Brown, APM**

- **Recently rekindled discussion is about collapsing the 25GBASE-CR-S and 25GBASE-CR PHYs into a single PHY, with optional implementation of the RS-FEC**
  - Per *hidaka\_100715\_25GE\_adhoc.pdf* and Comment D3.0, ID# i-31
  - Stated advantage: Simpler, less confusing to end user
  - Is it ? → Examine from two perspectives:
    - Possible PHY / FEC combinations supported in AN Link Codeword
    - Clarity to end user

- **There has been A LOT of discussion on this topic previously:**
  - AN / PHY Types:
  - Atlanta:
    - [http://www.ieee802.org/3/by/public/Jan15/marris\\_3by\\_01a\\_0115.pdf](http://www.ieee802.org/3/by/public/Jan15/marris_3by_01a_0115.pdf)
    - [http://www.ieee802.org/3/by/public/Jan15/balasubramonian\\_3by\\_01\\_0115.pdf](http://www.ieee802.org/3/by/public/Jan15/balasubramonian_3by_01_0115.pdf)
  - Berlin:
    - [http://www.ieee802.org/3/by/public/Mar15/dudek\\_3by\\_01b\\_0315.pdf](http://www.ieee802.org/3/by/public/Mar15/dudek_3by_01b_0315.pdf)
    - [http://www.ieee802.org/3/by/public/Mar15/slavick\\_3by\\_02a\\_0315.pdf](http://www.ieee802.org/3/by/public/Mar15/slavick_3by_02a_0315.pdf)
    - [http://www.ieee802.org/3/by/public/Mar15/dudek\\_3by\\_03a\\_0315.pdf](http://www.ieee802.org/3/by/public/Mar15/dudek_3by_03a_0315.pdf)
  - Adhocs:
    - Survey Monkey Poll: (77% = 2 Copper Twinax PHYs, 3m, and 5m based on Chicago Rules)  
[http://www.ieee802.org/3/25GSG/public/adhoc/architecture/nowell\\_090514\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/25GSG/public/adhoc/architecture/nowell_090514_25GE_adhoc.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/balasubramonian\\_121714\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/balasubramonian_121714_25GE_adhoc.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/baden\\_021115\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/baden_021115_25GE_adhoc.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/slavick\\_021815\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/slavick_021815_25GE_adhoc.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/baden\\_022515\\_25GE\\_adhoc\\_01.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/baden_022515_25GE_adhoc_01.pdf)
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    - [http://www.ieee802.org/3/by/public/adhoc/architecture/nowell\\_022515\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/nowell_022515_25GE_adhoc.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/dudek\\_030415\\_25GE\\_adhoc-v2.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/dudek_030415_25GE_adhoc-v2.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/baden\\_030415\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/baden_030415_25GE_adhoc.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/ran\\_100715\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/ran_100715_25GE_adhoc.pdf)
    - [http://www.ieee802.org/3/by/public/adhoc/architecture/hidaka\\_100715\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/hidaka_100715_25GE_adhoc.pdf)

## D3.0

Technology Ability Field		FEC Capability Field		
D30 / A9	D31 / A10	D44 / F2	D45 / F3	D43 / F4
25GBASE-KR-S / -CR-S	25GBASE-KR / CR	25G – RS FEC requested	25G – BASE-R FEC requested	reserved

## Proposed Change

Technology Ability Field		FEC Capability Field		
D30 / A9	D31 / A10	D44 / F2	D45 / F3	D43 / F4
25GBASE-KR / -CR	reserved	25G – RS FEC ability	25G – RS-FEC requested	BASE-R FEC requested

- Same number of bits are used within the link codeword base page in either case
- → no advantage derived from simplifying possible combinations

- User Question: Does my host support the cable I want to use?

D3.0

Host PHY Type	Supported Cable Types		
	CA-N	CA-S	CA-L
25GBASE-CR	Yes	Yes	Yes
25GBASE-CR-S	Yes	Yes	No

Supported cable type is unambiguous

Proposed Change

Host PHY Type	Supported Cable Types		
	CA-N	CA-S	CA-L
25GBASE-CR	Yes	Yes	<i><u>Optional†</u></i>

Whether CA-L is supported cannot be determined without further investigation

† depends on PHY implementation, user needs to check (reported in F2, or product documentation)

- **Although having a single PHY seems simpler, in reality it will cause confusion**
  - With RS-FEC made optional, the end-user needs to be savvy enough to:
    - A. know that it is optionally implemented and therefore may not be present
    - B. Find out where to check for it (product documentation etc)
    - C. Know that it is required if a CA-L cable is desired to be used
  - This confusion could arise when equipment is being selected (purchase decision) – and user may only find out CA-L is not supported after attempting to use it (frustration!)
- **The specification in D3.0 was reached after a lot of consensus building and detailed discussion**
  - 5 face to face meeting presentations and discussion
  - 11 ad-hoc presentations and discussion
  - Re-visiting this again will cause undesirable schedule impact to the project
    - This change will require significant editorial change to 30, 45, 73, 105, 110, 111, 110A/B/C (as noted in [http://www.ieee802.org/3/by/public/adhoc/architecture/brown\\_010616\\_25GE\\_adhoc.pdf](http://www.ieee802.org/3/by/public/adhoc/architecture/brown_010616_25GE_adhoc.pdf) )
- **There is no compelling reason or need for a change to the D3.0 specification**