IEEE 802.3 Electrical Backplane/ Twinax Cu Cable – Considerations for determining objectives
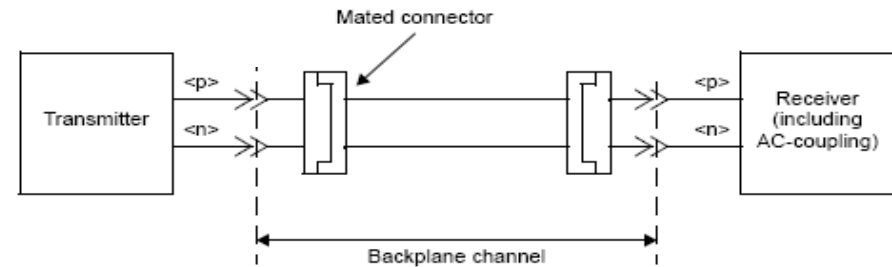
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Summary

Considerations for increasing 10 Gb/s/lane Cu channels

•**Support for legacy channels**
•**Channel PCB trace losses (material)**
•**Connector SI (e.g., loss, xtalk)**
•**Line code (e.g., NRZ, 4-PAM)**
•**Differential pair count**

Ethernet over backplane channel

•**Support for legacy channels (to 7m)**
•**Plug compatible port types**
  -4x10Gb/s and 4x25Gb/s
•**Host PCB trace losses (Tx or Rx PCB IL)**
•**Cable and connector SI (e.g., loss, xtalk)**
•**Line code (e.g., NRZ, 4-PAM)**
•**Differential pair count**
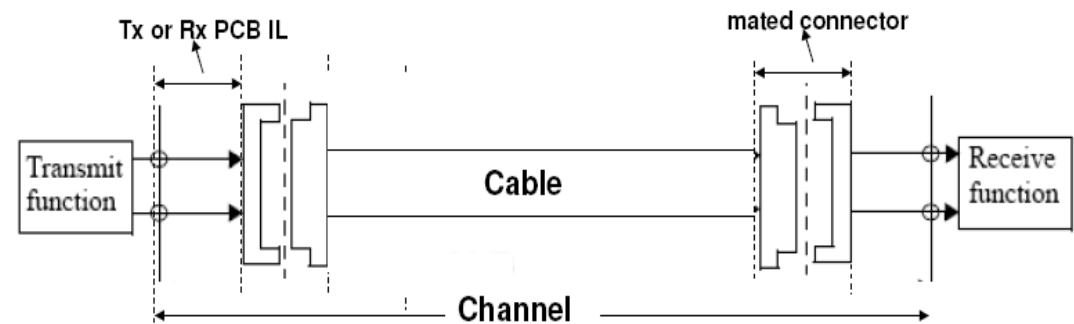
Ethernet over twinaxial copper cable assemblies

•**Common electricals for backplane and Cu cable assemblies (Tx and Rx functions).**

•**Market need defined in reach critical in selecting options (e.g., signaling rate, line code…..).**

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Media reach – use case 10 Gb/s

- **InfiniBand Integrators' List is designed to support data center managers, CIOs and other IT professionals with their planned deployment of InfiniBand solutions.**

SFF-8436	InfiniBand 10 GBd	Lanes	Length	#of suppliers out of 9
QSFP	QDR	4x	0.5	6
QSFP	QDR	4x	1	7
QSFP	QDR	4x	1.5	2
QSFP	QDR	4x	2	8
QSFP	QDR	4x	2.5	2
QSFP	QDR	4x	3	9
QSFP	QDR	4x	3.5	1
QSFP	QDR	4x	4	8
QSFP	QDR	4x	5	6
QSFP	QDR	4x	6	4
QSFP	QDR	4x	7	1

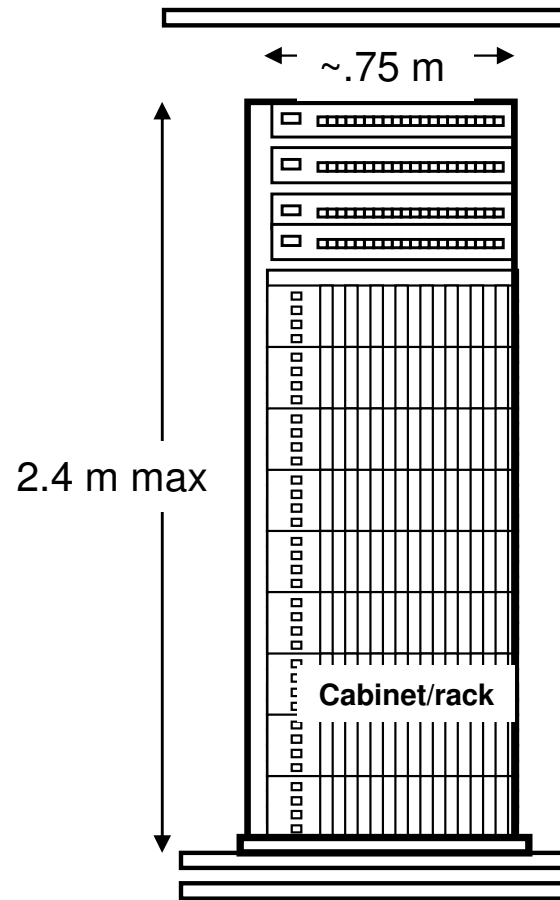- **Anecdotally – cable assembly suppliers are asked to support 7 meters but volumes are 1-5 meters.**

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Conclusion

- Determining cable assembly reach and transmit/receive PCB lengths (channel insertion loss budget) critical in selecting options (e.g., signaling rate, line code…..).
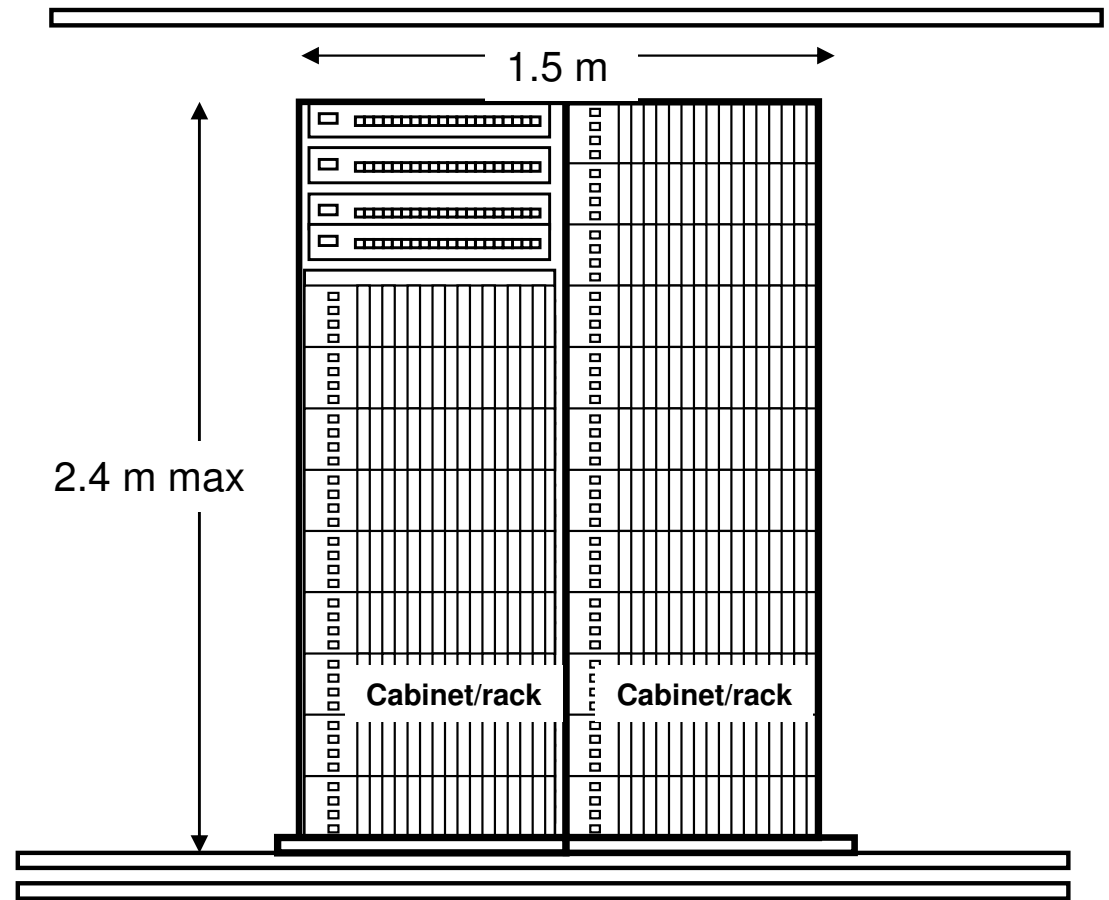
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Backup

Media reach

Intra-rack configurations

~.75 m

2.4 m max

Cabinet/rack

- **at least 3m addresses majority of configurations**

Inter-rack configurations

1.5 m

2.4 m max

Cabinet/rack   Cabinet/rack

- **3 to 7m addresses a meaningful portion of configurations**

802.3 Cu SG– March 2011

Media reach intra-rack applications

Switch aggregation
•Cost optimized
•At least 3 meters addresses majority of configurations

Blade/chassis aggregation /backplane extender
•Cost optimized
•At least 3 meters addresses majority of configurations

Switch aggregation

Chassis aggregation

Cabinet/rack

back of rack

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