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Update on IEEE 802.3ba 40 and 100GE

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IEEE 802.3ba Draft version 1.2

- ▶ Draft Amendment to IEEE Std 802.3-2008
- ▶ Amendment:
 - ▶ *Media Access Control Parameters , Physical layers and Management parameters for 40 Gb/s and 100 Gb/s Operation*



IEEE 802.3ba Draft version 1.2

- ▶ Does capture all the objectives
- ▶ Technical specifications could and will be modified and or clarified as implementations take off.
- ▶ Editorial work still necessary
- ▶ Draft 2.0 will be technically complete and go up for WG ballot
 - ▶ *Scheduled for march 2009*
- ▶ When schedule will hold, the standard for both 40 and 100GE will be delivered June 2010



IEEE 802.3ba Draft version 1.2

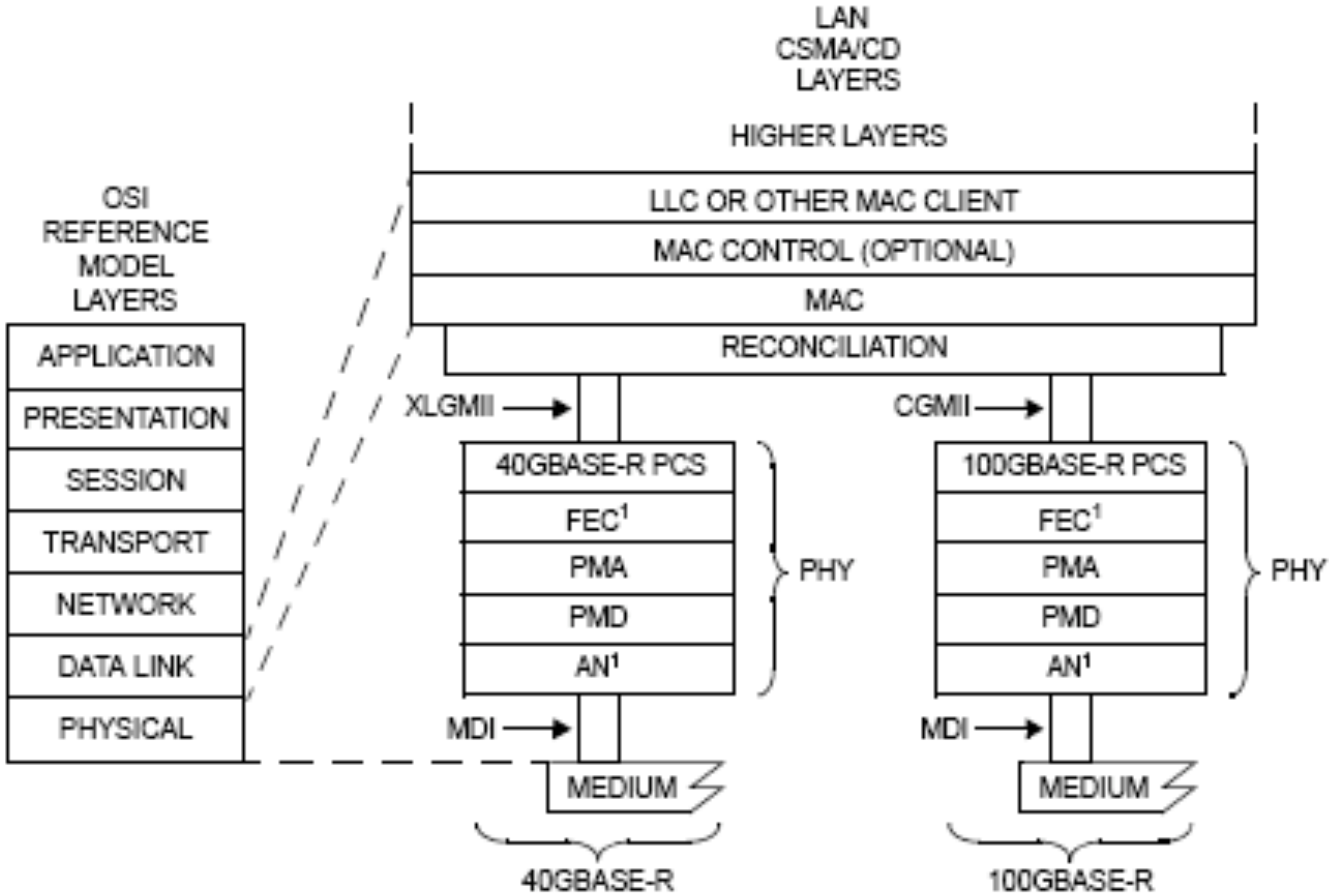
- ▶ Common objectives
 - ▶ *Support full duplex operation only*
 - ▶ *Preserve the 802.3 / Ethernet frame format utilizing the 802.3 MAC*
 - ▶ *Preserve minimum and maximum FrameSize of current 802.3 standard*
 - ▶ *Support a BER better than or equal to 10^{-12} at the MAC/PLS service interface*
 - ▶ *Provide appropriate support for OTN*
 - ▶ *transparant mapping of 40GE in ODU3*
 - ▶ *transcoding to be specified by ITU SG15*



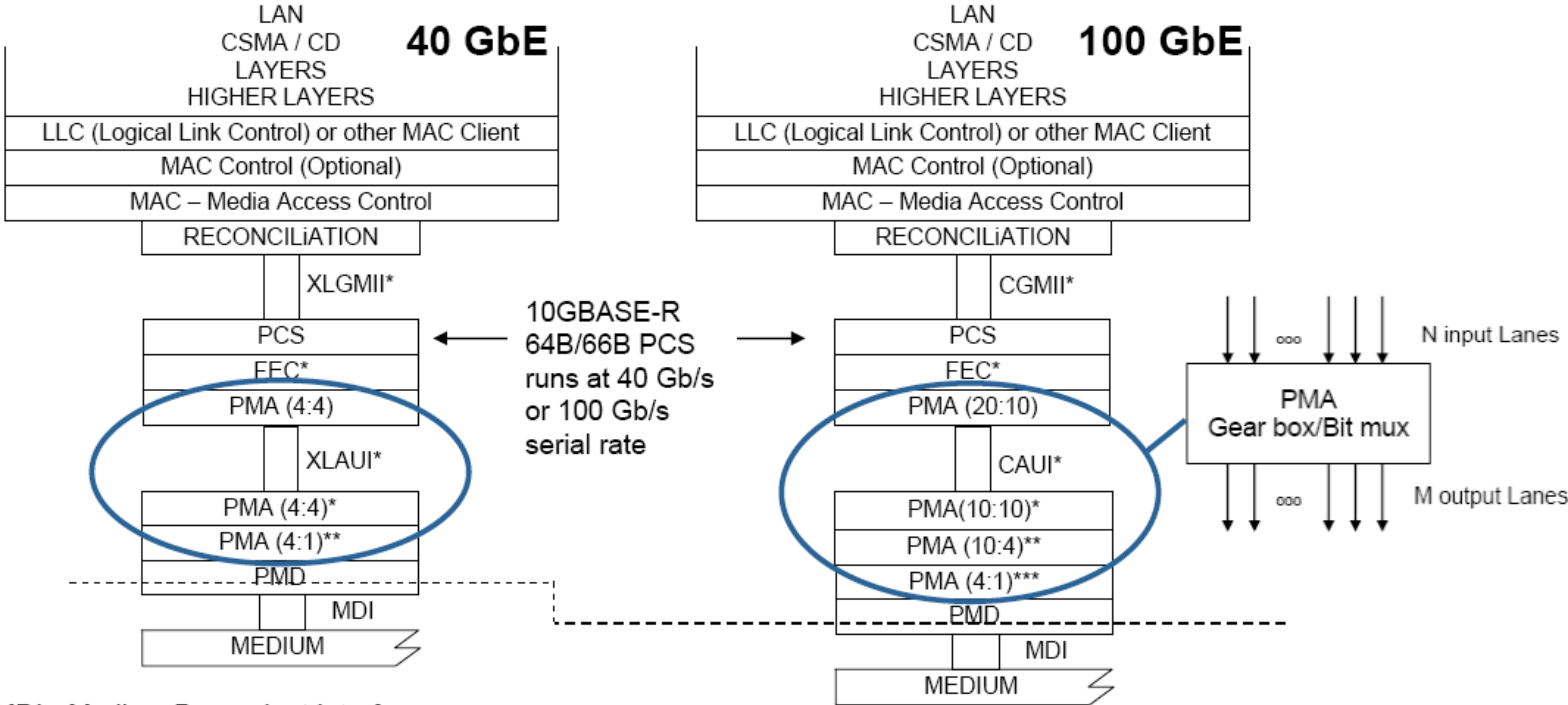
Reach objectives and physical layer specifications

	40GE	100GE	Solution
1m Backplane	40GBase-KR4	*	4 X 10 Gbit/s (reuse 10GBase-KR)
10m Copper	40GBase-CR4	100GBase-CR10	n X 10 Gbit/s (reuse 10GBase-KR)
100m OM3 MMF	40GBase-SR4	100GBase-SR10	n x 10 Gbit/s
10km SMF	40GBase-LR4	100GBase-LR4	4 x 10 Gbit/s 4 x 25 Gbit/s
40km SMF	*	100GBase-ER4	4 x 25 Gbit/s

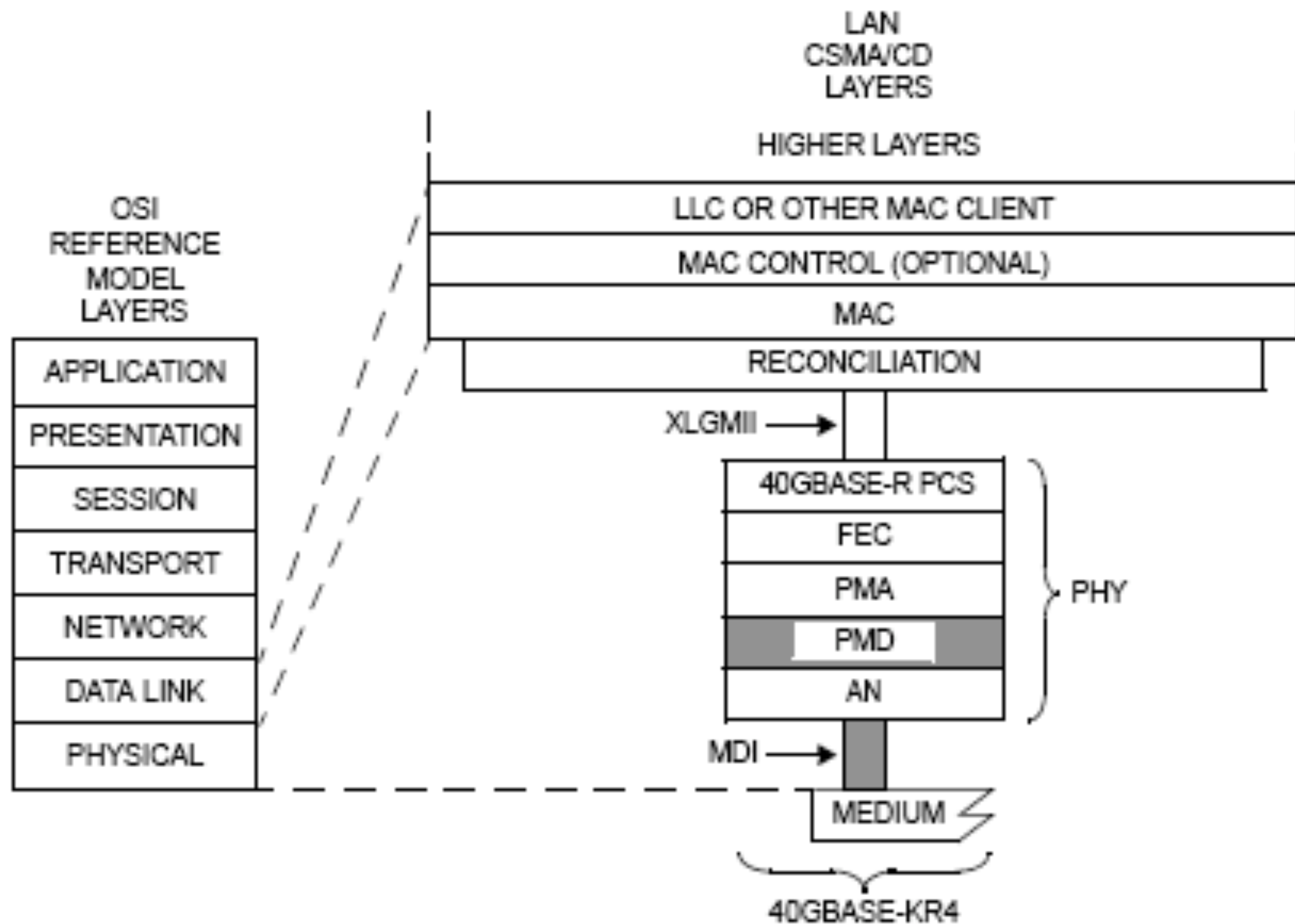
40GE, 100GE overall architecture



40GE, 100GE overall architecture

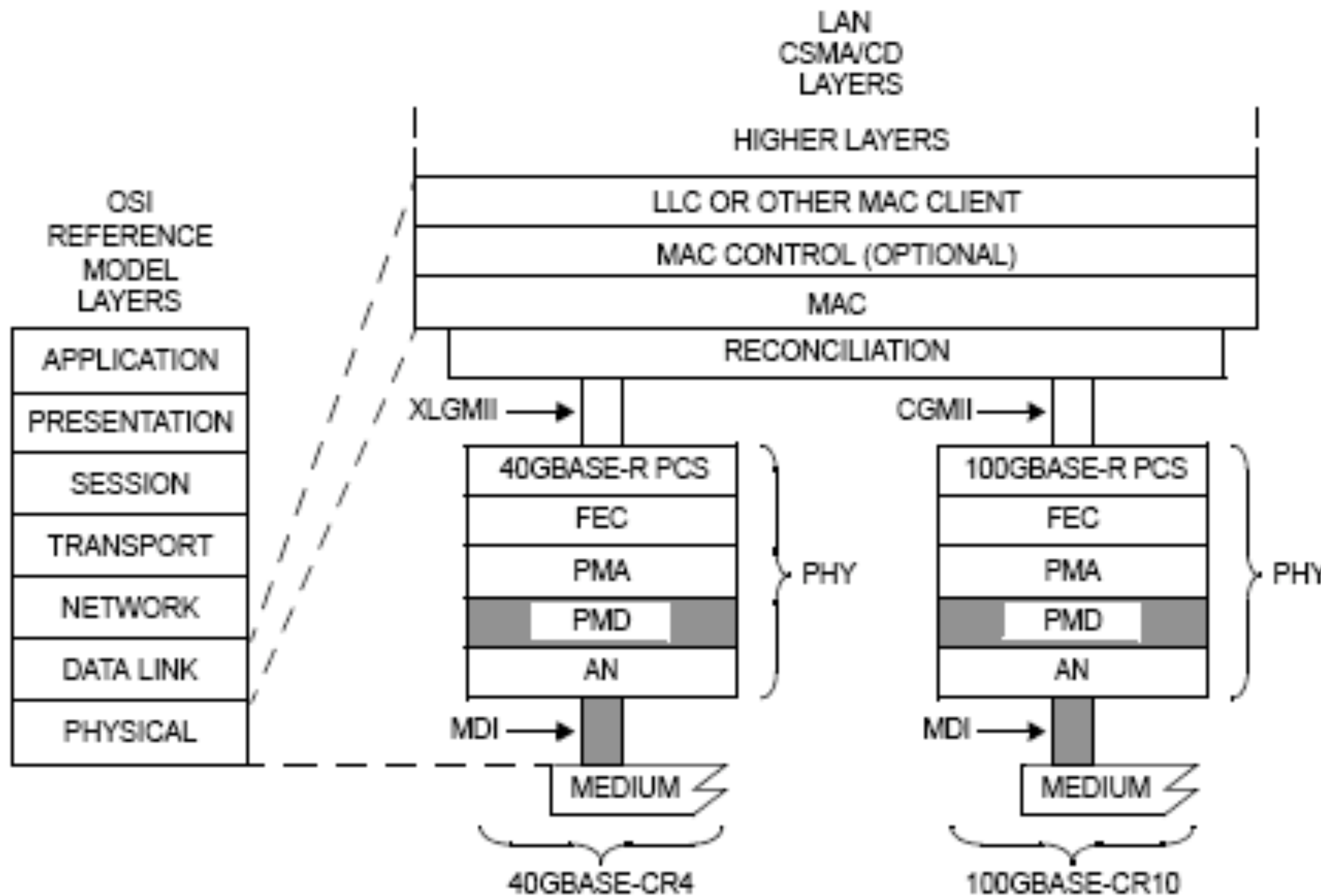


40GBase-KR4 Backplane



- ▶ re-uses 10GBase-KR
- ▶ *4 lanes of 10Gb/s*
- ▶ Auto-negotiation
- ▶ *Speed*
 - ▶ 1 to 40 Gigabit/s for backplanes
- ▶ Capabilities
- ▶ There might be adjustments based on EEE (Energy Efficient Ethernet)

40GBase-CR4, 100GBase-CR10



▶ Reusing the 10GBase-KR architecture

▶ *40GBase-CR4: 4 x 10Gbit/s*

▶ *100GBase-CR10: 10 x 10Gbit/s*

Cable parameters based on 10GBase-CX4

Autonegotiation

Connector

▶ *4 x MDI : QSFP*

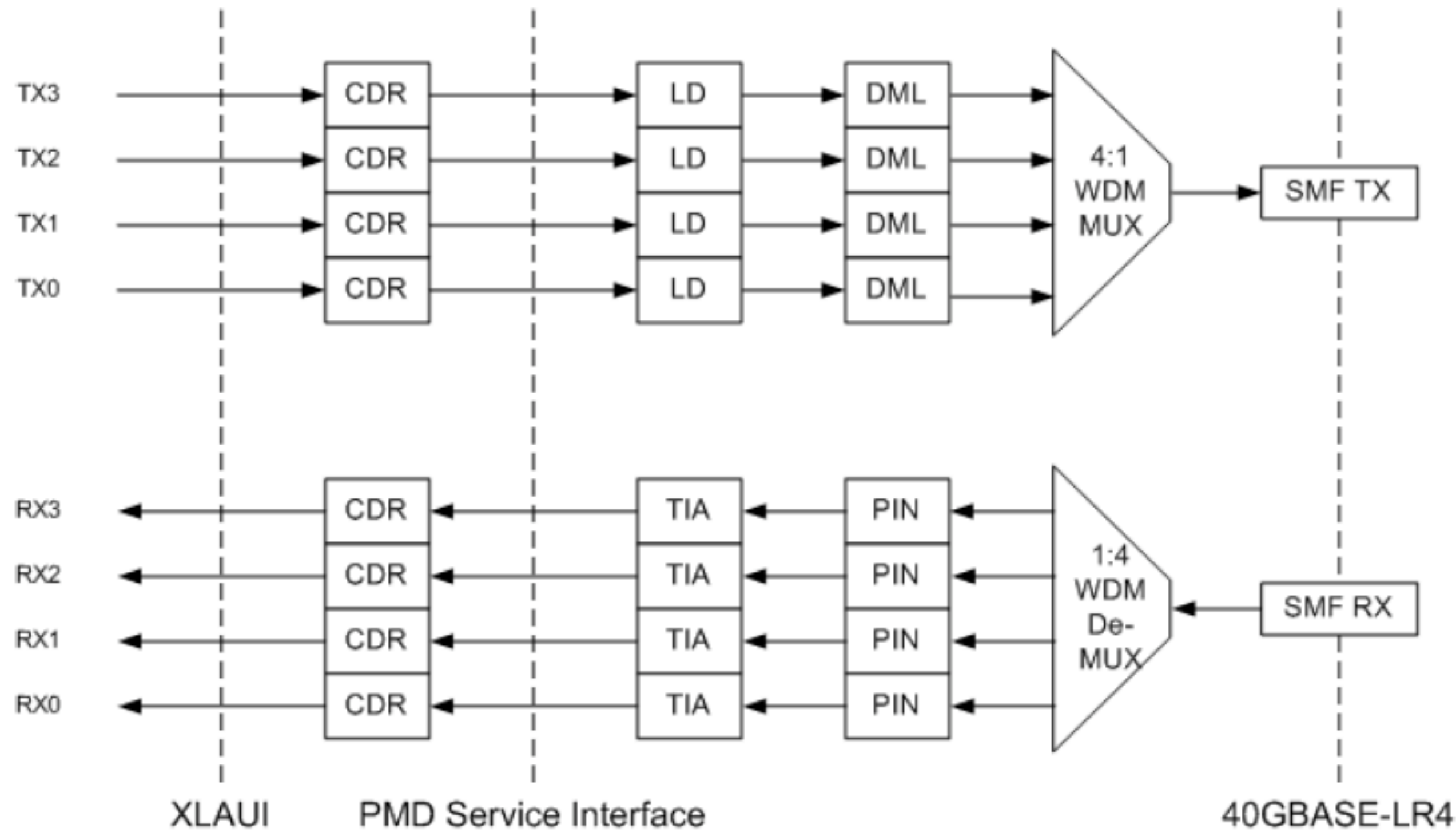
▶ *10 x MDI: SFF-8092*

40GBase-SR4 and 100GBase-SR10 100m OM3 MMF

- ▶ 40GBase-SR4
 - ▶ *4 parallel lanes for both Tx and Rx of over 4+4 parallel fibers*
 - ▶ *Connector is high density small form factor*
- ▶ 100GBase-SR10
 - ▶ *10 parallel lanes for both Tx and Rx of over 10+10 parallel fibers*
 - ▶ *Connector is high density small form factor*
- ▶ There seems to be a lot of interest in going beyond 100m
 - ▶ *Ongoing debate on how far the adopted proposal can actually go?
for example over OM4 MMF*



40GBase-LR4



▶ CWDM baseline grid

▶ ITU G694.2

▶ *1270 nm*

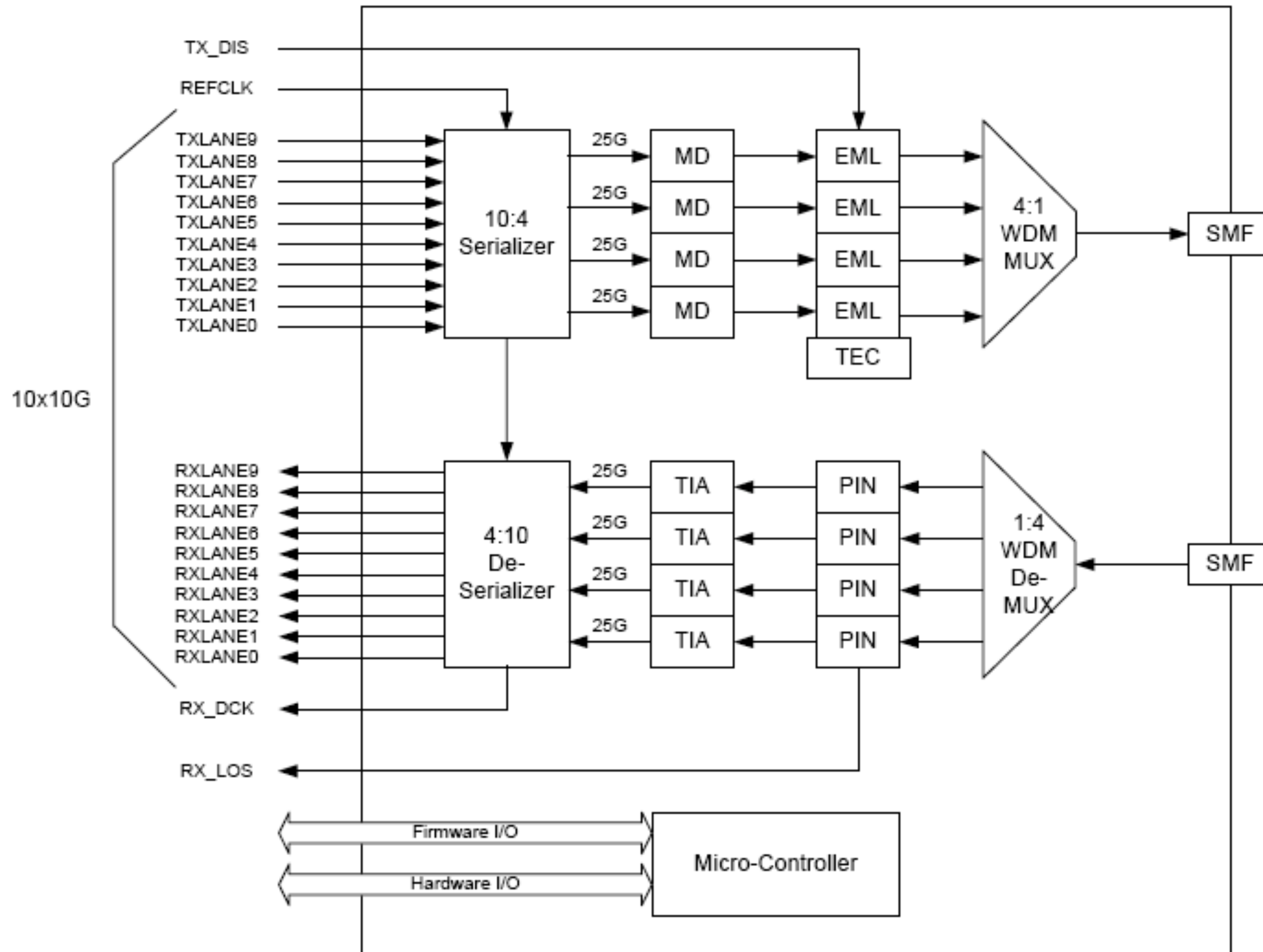
▶ *1290 nm*

▶ *1310 nm*

▶ *1330 nm*



100GBase-LR4



▶ LAN WDM baseline grid

▶ *ITU G694.1*

▶ 1295 nm

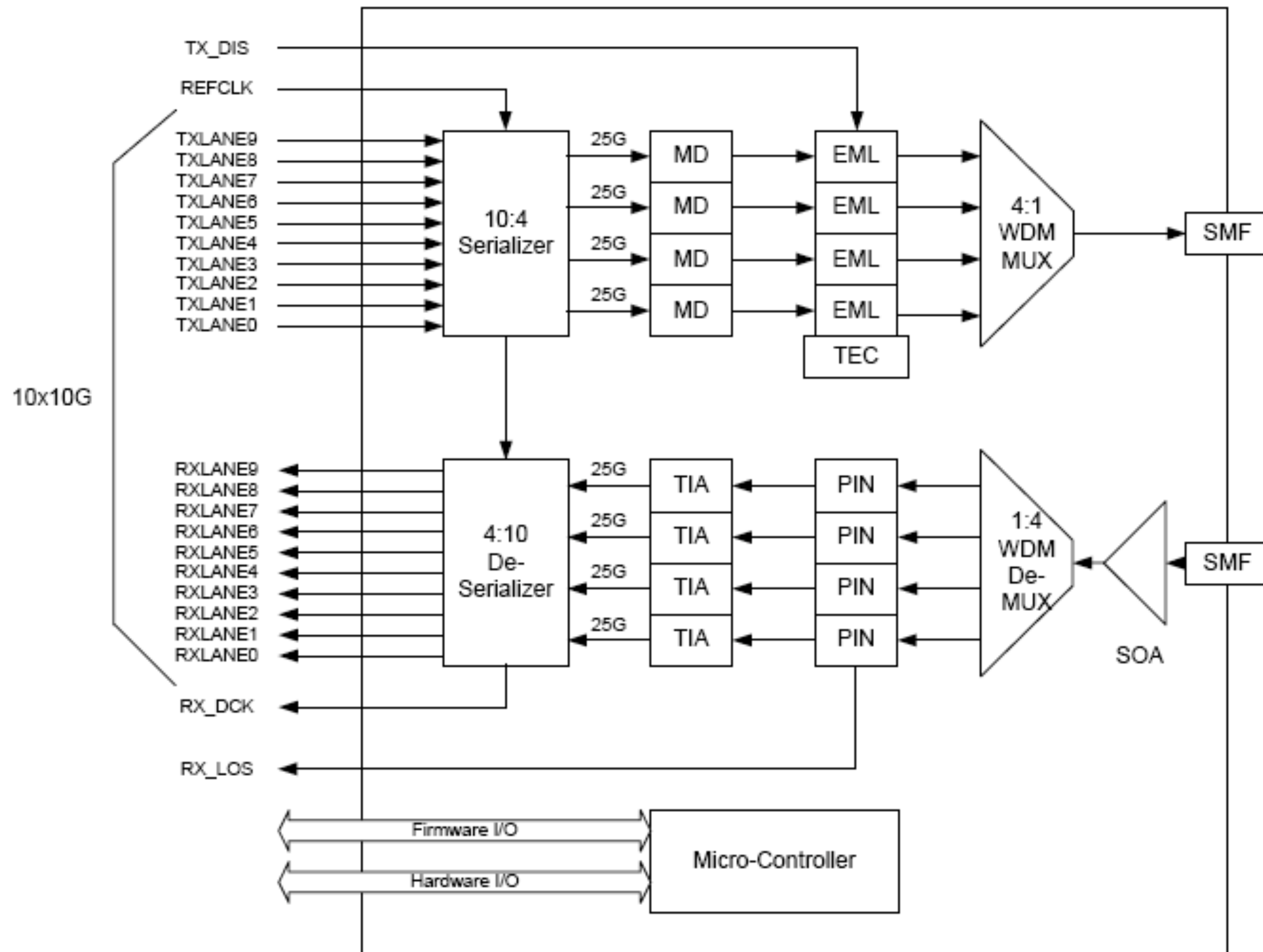
▶ 1300 nm

▶ 1305 nm

▶ 1310 nm



100GBase-ER4



▶ LAN WDM baseline grid

▶ *ITU G694.1*

▶ 1295 nm

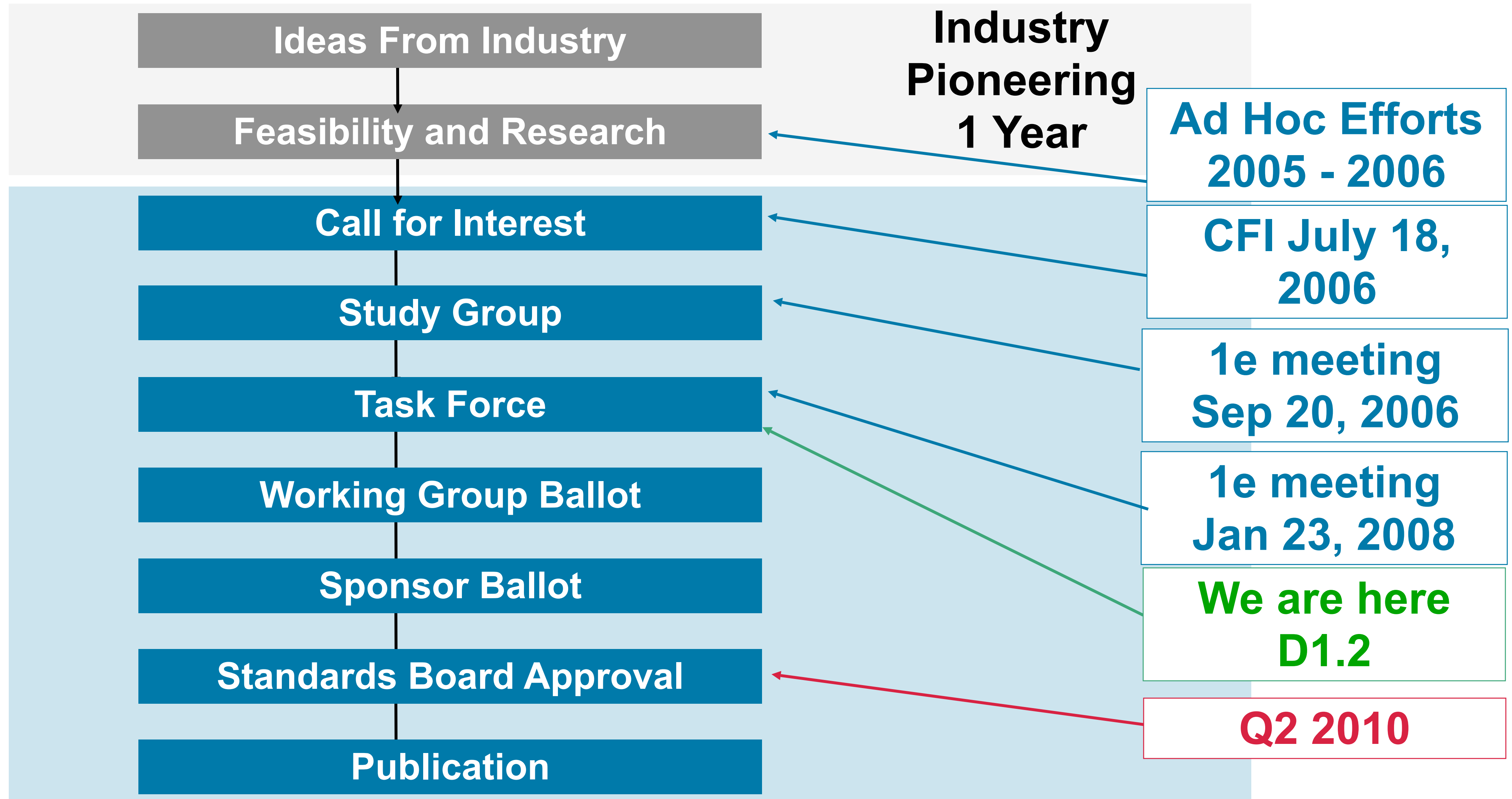
▶ 1300 nm

▶ 1305 nm

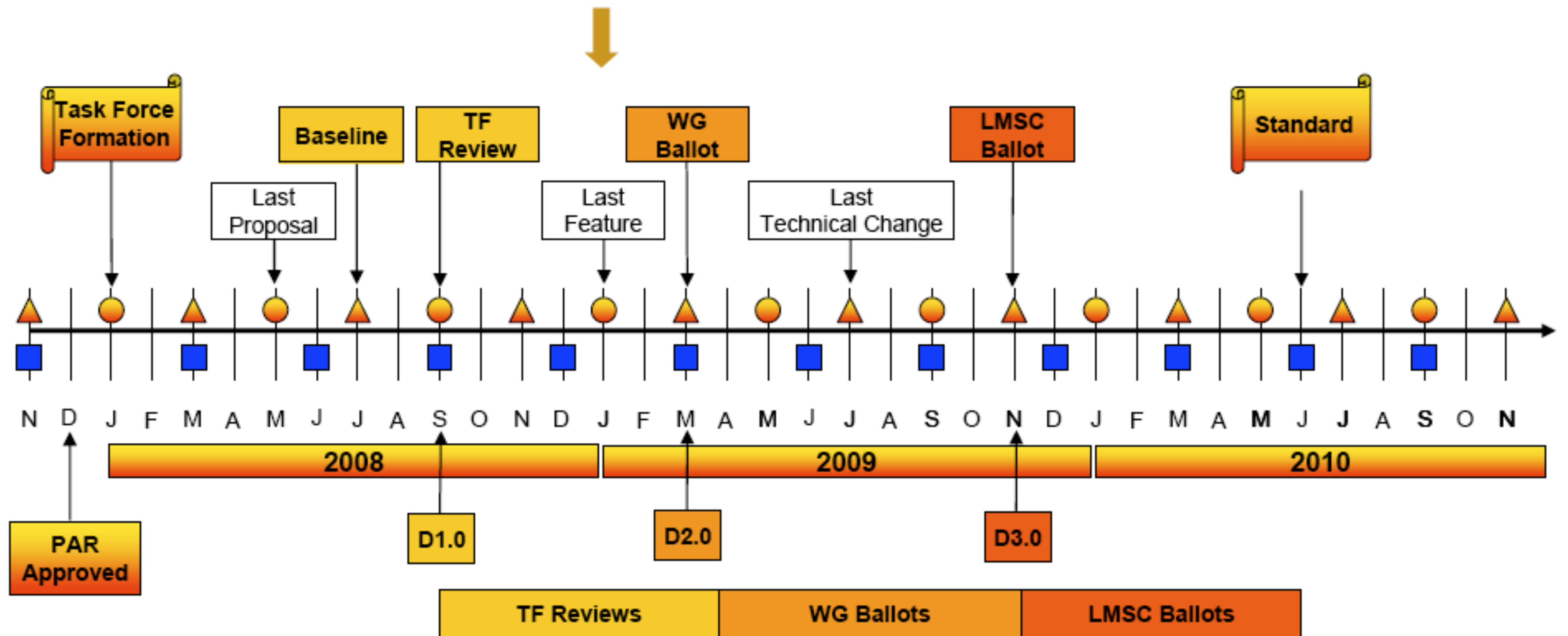
▶ 1310 nm



Where is the standard process now?



IEEE802.3ba Task Force timeline



- Legend**
- ▲ IEEE 802 Plenary
 - IEEE 802.3 Interim
 - IEEE-SA Standards Board

Next meetings

- ▶ March 2009 plenary
 - ▶ March 8 - 13 Vancouver
- ▶ More information on:
 - ▶ <http://grouper.ieee.org/groups/802/3/ba>



Questions?



Abbreviations

AN	Auto Negotiation
C/XL GMII	40/100 Gbs Media Independent Interface
FEC	Forward Error Control
LLC	Logical Link Control
MAC	Media Access Control
MDI	Medium Dependent Interface
PCS	Physical Coding Sublayer
PHY	Physical Layer Device
PMA	Physical Medium Attachment
PMD	Physical Medium Dependent
C/XL AUI	Chip2Chip or Chip2Module interface