

10Gb/s Electrical Interface Proposal for 40GbE and 100GbE

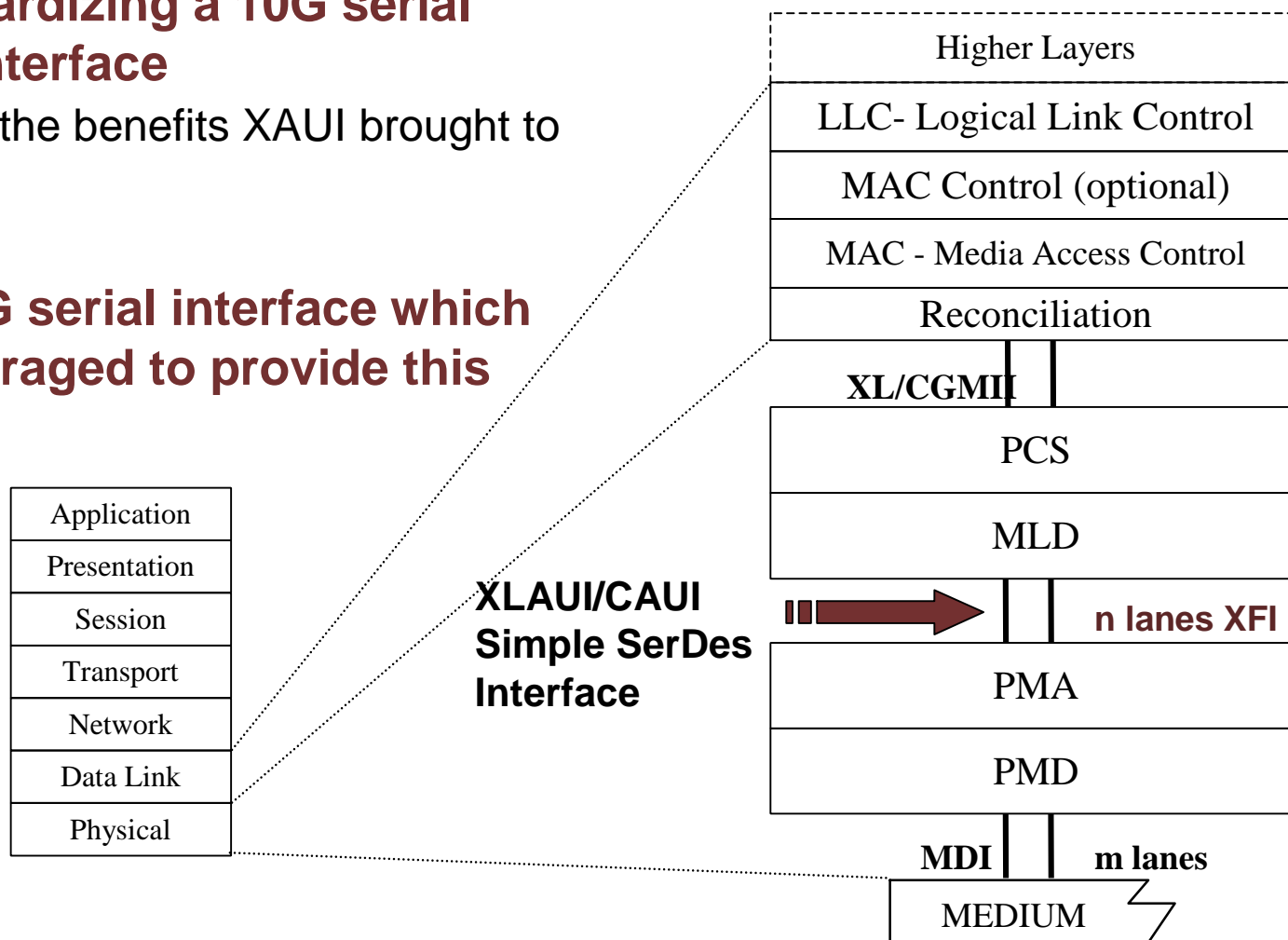
Ryan Latchman
ryan_l@gennum.com

Ali Ghiasi
aghiasi@broadcom.com



- **Introduction**
- **Benefits of XAUI to 10GbE**
- **Purpose of Defining Electrical Interface in 40/100GbE**
- **XFI Interface Proposal**
- **Conclusion**

- **The 40/100 GbE standard will benefit from standardizing a 10G serial electrical interface**
 - Similar to the benefits XAUI brought to 802.3ae
- **XFI is a 10G serial interface which can be leveraged to provide this function**



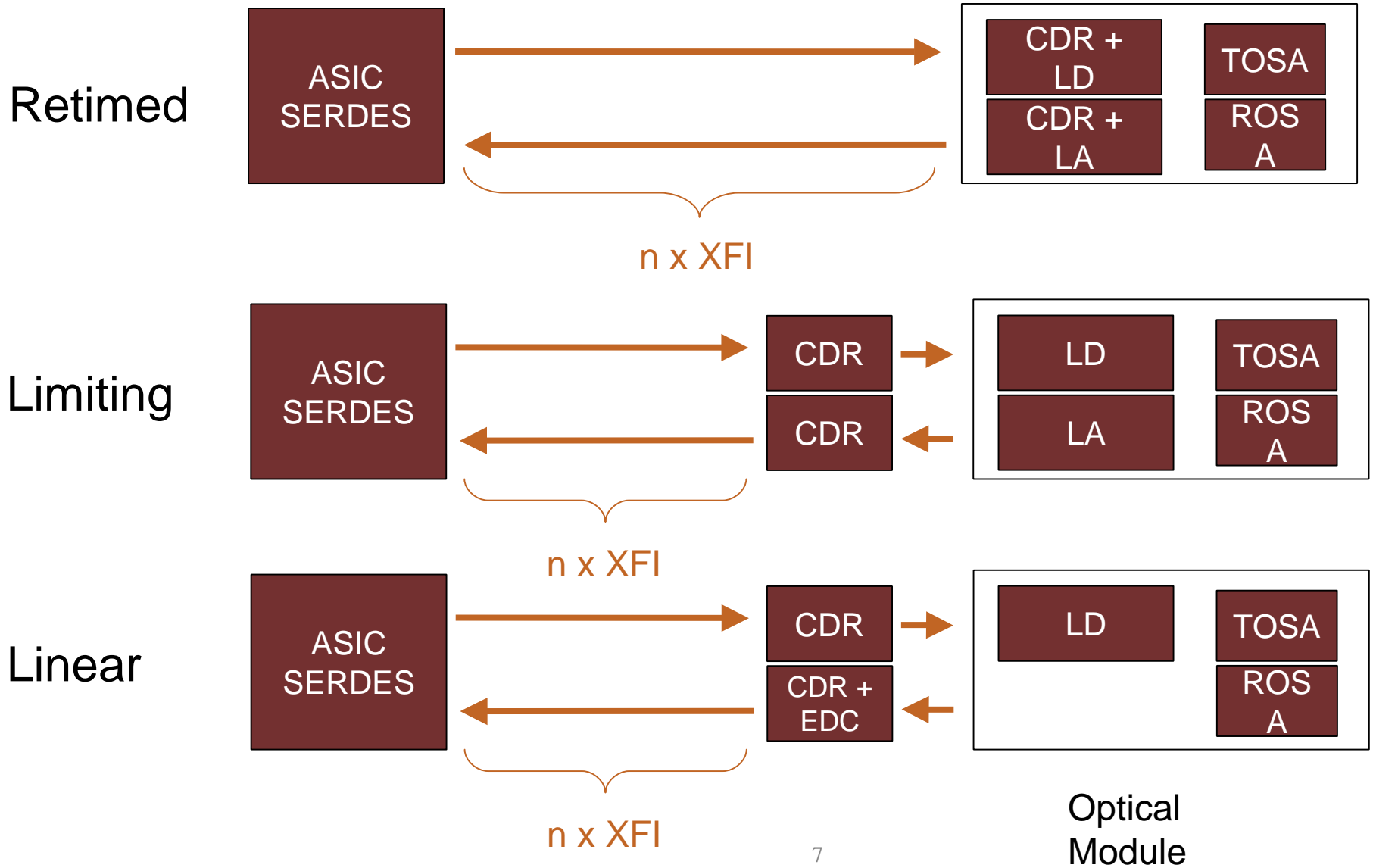
- **Provided the industry with a starting point**
 - low cost, common interface for discrete / pluggable components commonly used in 10G Ethernet Systems
 - Prevented significant segmentation which would have delayed deployment & resulted in higher cost
 - Provided a standard based mechanism to communicate 10Gb/s over multiple lanes
- **XAUI is still used as an interface to ASICs, SERDES, Repeaters, modules!**

- **XLAUI/CAUI based on simple SerDes interface “XFI” ensure low cost, common interface for discrete / pluggable components commonly used in 40G / 100G Ethernet Systems**
 - ASIC, SERDES, Repeaters, Modules....
- **Previously in ghiasi_01_0108, a unified PMD interfaced was proposed but received significant resistance as this implementation would burden all PMDs with Gearbox.**
- **Use of robust simple SerDes interface meets 40G/100G technical requirements and schedule objectives.**
 - XLAUI/CAUI allow the standard to move forward by eliminating interdependencies of different PMD type.
 - Since XLAUI/CAUI are optional layers unified PMD interface can still be implemented for specific applications on in future.

- **XFI Interface can be leveraged to satisfy 40G/100G requirements**
 - 10G Serial Interface which can be used to communicate 40G or 100G by using n lanes where n = 4 or 10
 - Flexible enough to allow for numerous system architectures
- **Greater than 50 networking companies with products associated with XFI**

Characteristic		Comment
Common Interface	✓	Supports Retimed, Limiting, and Linear for 40G/100G
Robust Interface	✓	Currently used to communicate 10GbE data, can be leveraged to satisfy 40G/100G objectives
Schedule	✓	Leverage SFF Committee work

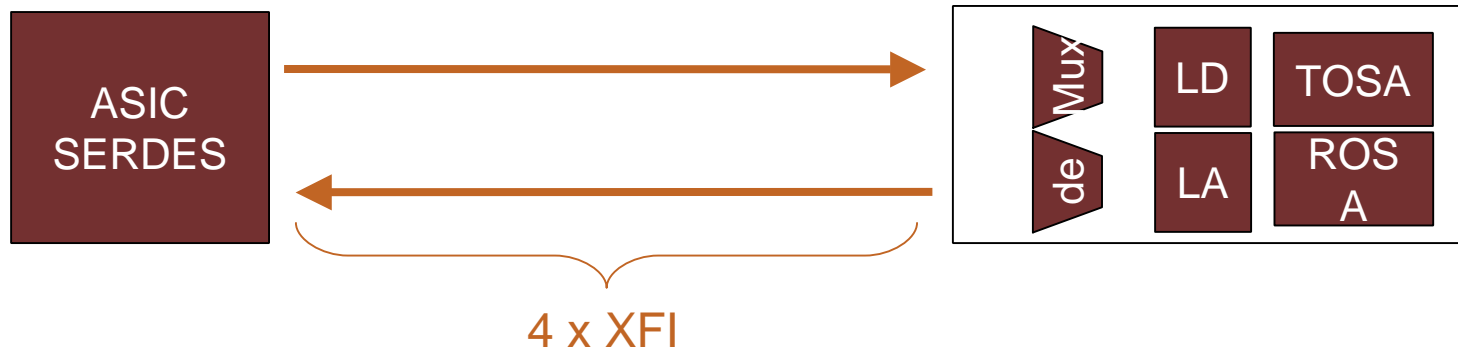
Common Interface – Retimed, Linear, Limiting



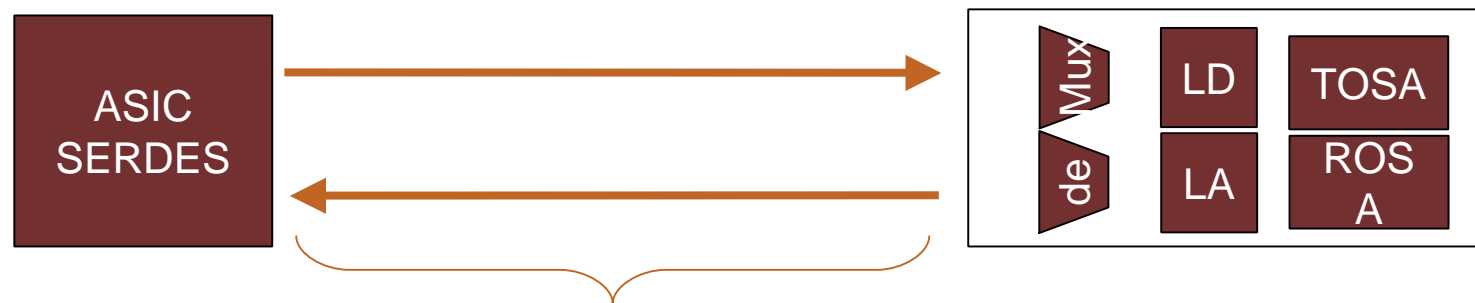
Common Interface – 40G, 100G



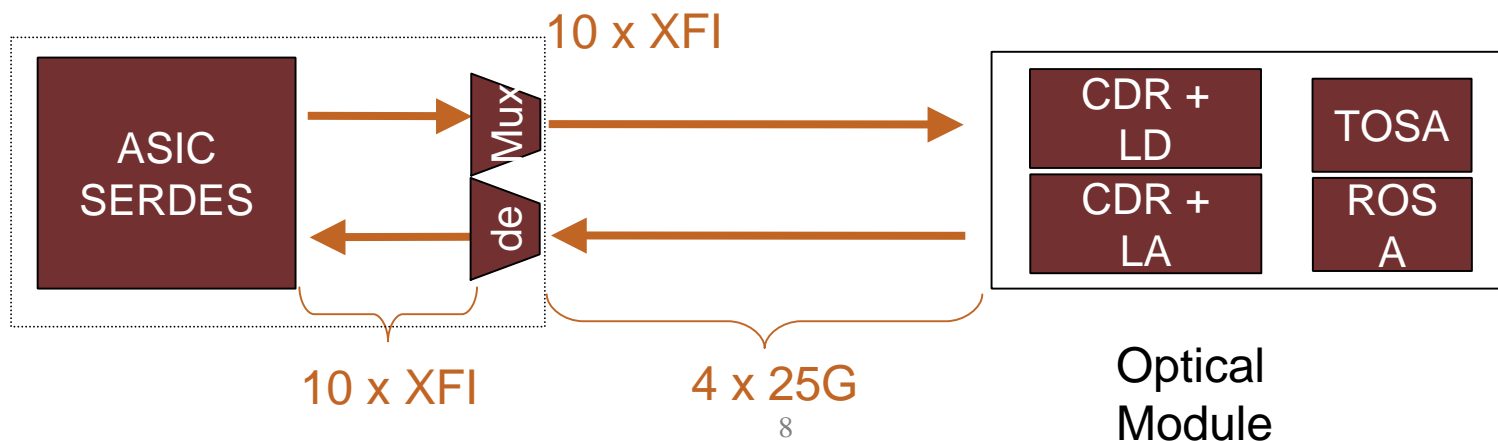
40G



100G
(Gen I)



100G
(Gen II)



Optical
Module

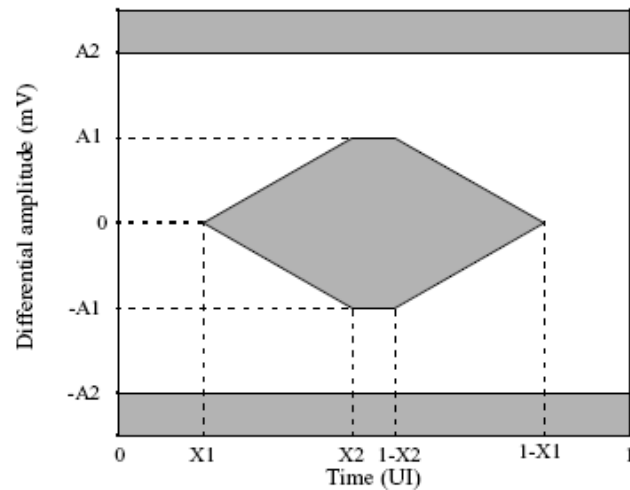


Figure 47-4—Driver template

Table 47-2—Driver template intervals

Symbol	Near-end value	Far-end value	Units
X1	0.175	0.275	UI
X2	0.390	0.400	UI
A1	400	100	mV
A2	800	800	mV

XAUI

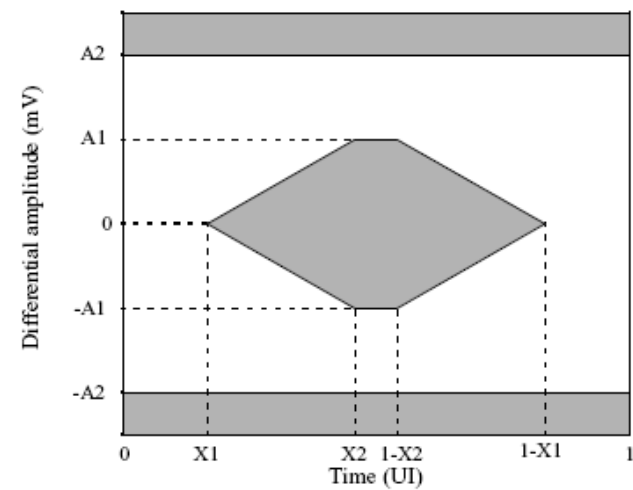


Figure 47-4—Driver template

Table 47-2—Driver template intervals

Symbol	Near-end value	Far-end value	Units
X1	0.170	0.305	UI
X2	0.420	NA	UI
A1	170	60	mV
A2	425	410	mV

XFI

Conclusion



- **The 40/100 GbE standard will benefit from standardizing extender layer XLAUI/CAUI based on nx10G serial electrical interface**
 - Similar to the benefits XAUI brought to 802.3ae
- **XFI is the robust 10G simple SerDes interface which can be leveraged.**
 - A. Ghiasi the editor of the XFP MSA has agreed to provide the frame source file for XFI section to the 802.3ba editor.

