Electrical Interfaces, Always Standardized, and Now Standardizing 100 Gb/s

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OIF's CEI work has been a significant industry contributor

Name	Rate per pair	Year	Activities that Adopted, Adapted or were influenced by the OIF CEI
CEI-56G	56Gbps	2016-7	Advanced draft documents being shared with many organizations
CEI-28G	28 Gbps	2011	InfiniBand EDR, 32GFC, SATA 3.2, SAS-4,100GBASE-KR4, CR4, CAUI4
CEI-11G	11 Gbps	2008	InfiniBand QDR, 10GBASE-KR, 10GFC, 16GFC, SAS-3, RapidIO v3
CEI-6G	6 Gbps	2004	4GFC, 8GFC, InfiniBand DDR, SATA 3.0, SAS-2, RapidIO v2, HyperTransport 3.1
SxI5	3.125 Gbps	2002-3	Interlaken, FC 2G, InfiniBand SDR, XAUI, 10GBASE-KX4, 10GBASE-CX4, SATA 2.0, SAS-1, RapidIO v1
SPI4, SFI4	1.6 Gbps	2001-2	SPI-4.2, HyperTransport 1.03
SPI3, SFI3	0.800 Gbps	2000	(from PL3)

Having a few standardized electrical interfaces has been critical to our industry

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Related to the IEEE Applications

- **A small number of standardized OIF electrical rates have supported many IEEE data rates and per channel rates**

OIF CEI Specification	IEEE base rate	x2	x4	x 10	x16
10 Gb/s OIF-CEI-01.00 Dec 2004	10Gb/s XFI, SFI		40Gb/s XLAUI-4 XPPI-4	100Gb/s CAUI-10 CPPI-10	
28 Gb/s OIF-CEI-03.1 Feb 2014	25Gb/s 25GAUI	50Gb/s (25/50 Consortium)	100Gb/s CAUI-4		400Gb/s 400GAUI-16

- **Protects industry investments: silicon, optics, interconnects**

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Looking Forward

- **The race isn't going to end**
  - **Different reach objectives**
  - **Higher aggregate bandwidths are required**
  - **Higher per channel rates**
  - **Higher density channels**
- **With each doubling, the technical and economic challenges are increasing**
  - **It is more critical than ever to work together**
- **The OIF is going to keep addressing the market need by delivering consensus-based electrical channel solutions**

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OIF Work In Progress

- **The OIF's CEI-56G projects are nearing completion**

OIF CEI	IEEE base rate	x2	x4	x 8	x16
56 Gb/s	50Gb/s 50GAUI	100Gb/s 100GAUI-2	200Gb/s 200GAUI-4	400Gb/s 400GAUI-8	800Gb/s 800GAUI-16
112 Gb/s	100Gb/s 100GAUI	200Gb/s 200GAUI-2	400Gb/s 400GAUI-4	800Gb/s 800GAUI-8	1.6Tb/s 1600GAUI-16

- **The OIF started a project in August 2016 to address 112 Gb/s**
  - **Initially aimed at the Very Shot Reach (VSR, chip to module) application, but other electrical channel reaches are expected to be added**
  - **Objectives: increase port density by at least a factor of 2 and reduce normalized power consumption**
  - **Project will define usage models, modulation, equalization, eye opening, compliance test methodology, etc.**

Having a few standardized electrical interfaces is critical to our industry

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Thank you!

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