

Proposal for 100G PHY SMF Objective

Jon Anderson, Opnext

John Petrilla, Avago Technologies

Tom Palkert, Luxtera

Next Gen 100GbE Optical SG, Newport Beach, January 2012

Introduction

- One of the key study points for the Next Generation 100 Gigabit Optical Ethernet Study Group (SG) is to determine if there is sufficient market demand, technical maturity and economic feasibility of short reach, single mode optical solutions to justify IEEE 802.3 specification of a new duplex SMF interface in addition to the existing 100GBASE-LR4 specification.
- This contribution summarizes key results of the SG analysis to date on SMF optical interfaces and based on this work, proposes that a short reach, SMF objective be adopted by the SG.

SG Analysis Summary on SMF

- Trends analyses of data center optical fiber cable link lengths indicate increasing demand for interconnects greater than 100m. Ref. [kolesar_01_0911_NG100GOPTX](#), [ghiasi_01_0911_NG100GOPTX](#)
 - Several alternative short reach single mode fiber optical technologies were presented and indicate a reasonable level of technical feasibility and maturity for commercial application within the next few years. Ref.
 - [palkert_01_1111_NG100GOPTX](#),
 - [anderson_01_1111_NG100GOPTX](#), [anderson_01_0112_NG100GOPTX](#)
 - [petrilla_01_1111_NG100GOPTX](#), [petrillia_01_0112_NG100GOPTX](#)
- Other solutions not fully addressed in this SG to date may also be suitable. Ref. [nowell_01_1111_NG100GOPTX](#)
- A potential for significant cost reduction (of the order 50-75%) relative to 100GBASE-LR4 was identified in at least one of the proposed solutions ([anderson_01_1111](#) and [anderson_01_0112](#)) indicating economic feasibility of SMF optical interface for short reach application.

SG Analysis Summary on SMF Cont.

- Short reach SMF optical interfaces studied to date are proposed to support at least 500m up to 2000m interconnects and thus are distinct from the existing 100GBASE-LR4 (10km SMF) interface and to be defined 100GBASE-SR4 interface proposed for 100m MMF.
- The potential of the short reach SMF optical interface for broad market application, while not explicitly quantified by the SG, appears to self-evident given the potential lower cost relative to the existing 100GBASE-LR4 and the broad demand application in data centers throughout the world.

Proposal

- Given the conclusions of the SG work to date on short reach SMF optical interfaces, it is proposed the following objective be adopted by the SG:

“Define a 100 Gb/s (4 lane) PMD that will operate over at least 1 km of multi-lane SM fiber (G.652) with BER < 10^{-12} based on 1310 nm lasers, NRZ modulation and 64b/66b encoding.”

End of Contribution

Thanks!