Network Elements Inc.

enabling the Next Generation Internet

Optical Internetworking Forum Report

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Optical Internetworking Forum

- The mission of the Optical Internetworking Forum (OIF) is to foster the development and deployment of interoperable products and services for data switching and routing using optical networking technologies.

OIF Working Groups

- Architecture
  - Develops and recommends implementation agreements related to architectures for Optical Internetworks.
- OAM&P
  - Develops operations, administration, maintenance and provisioning requirements, guidelines, and implementation agreements related to optical internetworking.
- Physical and Link Layer (PLL)
  - Specifies implementation agreements related to physical and data-link layer interfaces between Optical Internetworking elements, reusing existing standards when applicable.

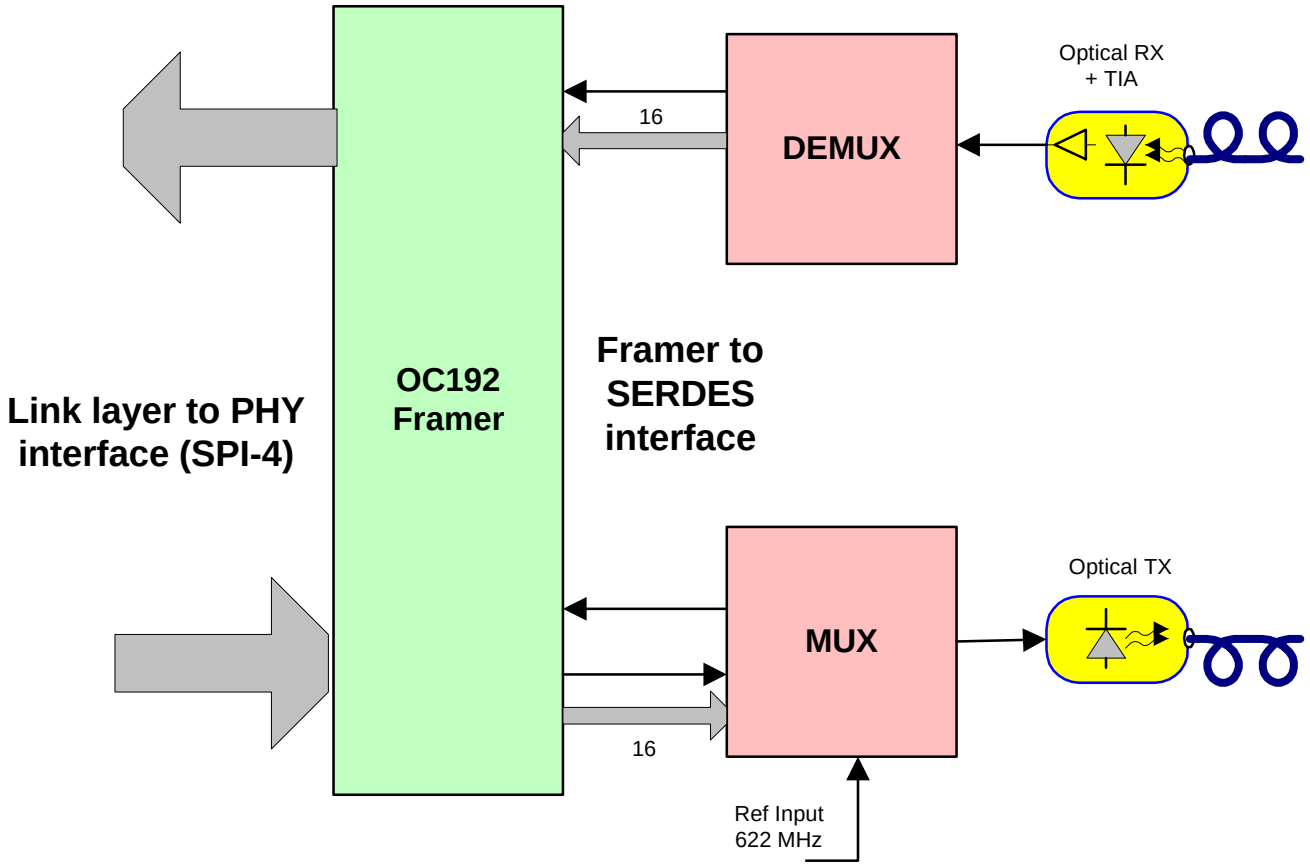
PLL Study Items

- Development of 10Gb/s interface based upon SONET/SDH standards
  - Selection of appropriate physical interfaces (SR, IR, LR, etc.)
  - Payload mapping
  - Synchronization and jitter requirements
  - Link layer protocol
- Development of interface agreements based on Packet-Over-SONET/SDH (POS) at 155 Mb/s, 622 Mb/s, and 2.5 Gb/s
  - All of the above issues for STS-1/STS-3c/STS-12c/STS-48c and a combination thereof

PLL Study Items (Cont'd)

- Development of a low-cost 10 Gb/s interface for intra-office data applications
- Development of standard System Physical Interface (SPI) for interconnection between the physical and link layer devices
- Development of specifications for SERDES/Framer electrical interface for OC192

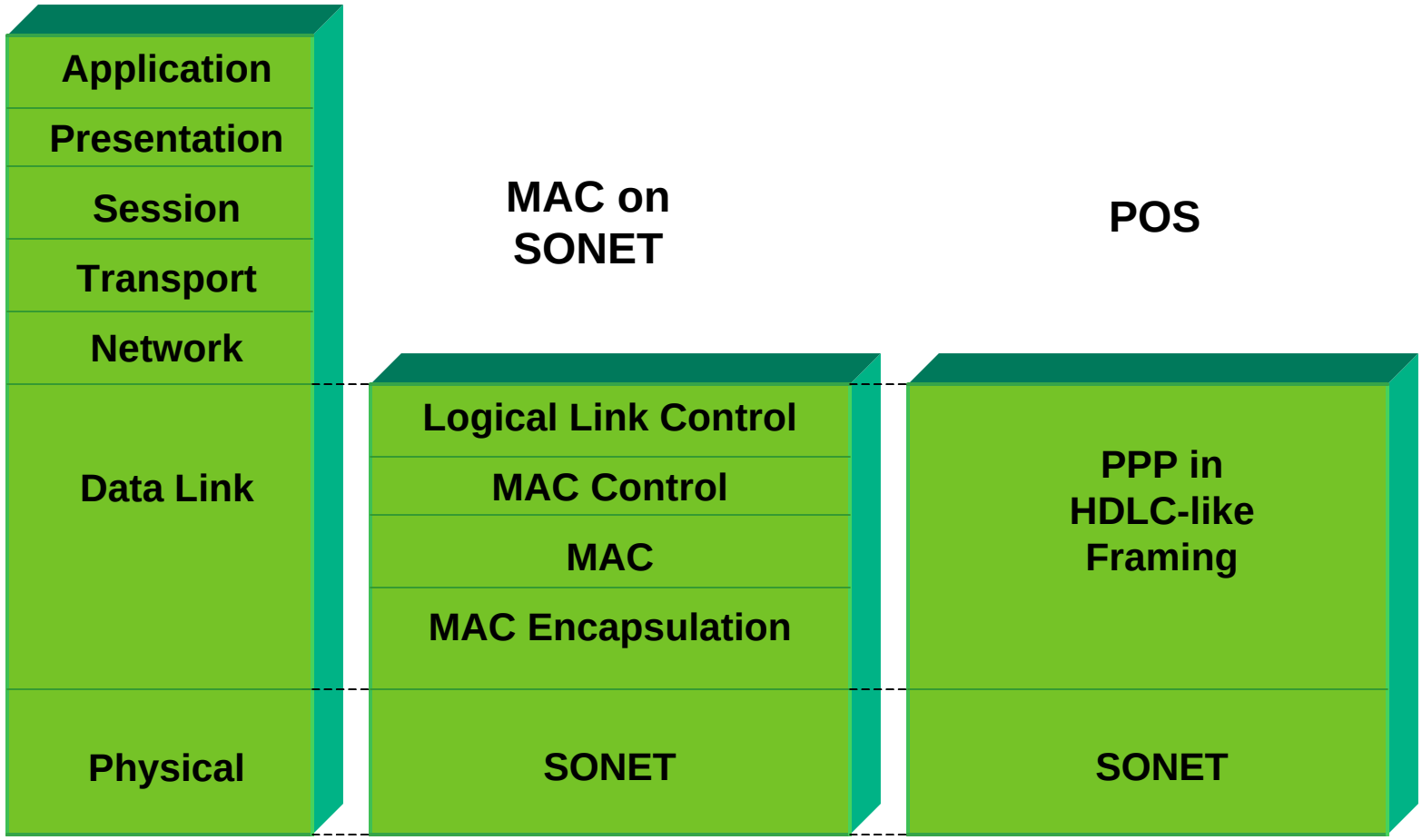
OIF PHY/SERDES interfaces



10Gb/s Interface Status

- The PLL has agreed to baseline a Packet over SONET (POS) interface for physical / link layer combination
- Nortel gave an informational presentation of the MAC over SONET T1X1 proposal

Mac on SONET vs. POS



POS Interfaces at 2.5Gb/s, etc.

- No new presentations

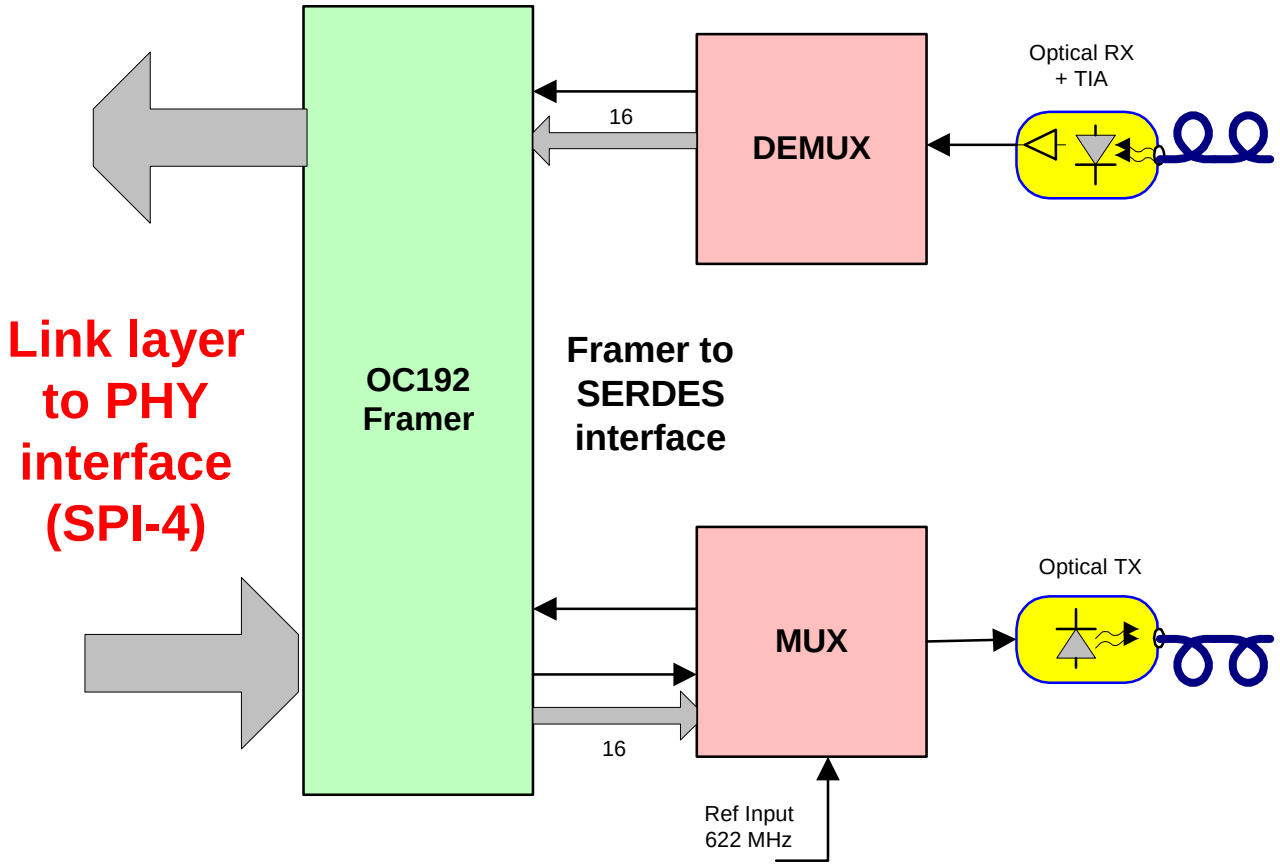
Low-Cost 10Gb/s Interface

- PLL has agreed to pursue a low-cost 10Gb/s interface implementation
- Presentations have been made for parallel fibre and serial fibre connections
  - The group adopted a baseline document for a parallel fibre implementation (10x1.25Gbps, with parallel protection and error correction channels, 400m MMF connection)
  - The group agreed to develop a serial interface implementation (2km connection)
- AT&T made a presentation claiming that a very short reach interface (100 to 500m) would satisfy 75% of OC-192 needs

System Physical Interface

- The SPI interface communicates packets from a link to a PHY device
- Two SPI developments underway:
  - SPI-3 (2.5Gbps)
    - Baseline document is the Saturn Group POS-PHY 3
    - 32 x 100Mbps LVDS connection with parallel control
  - SPI-4 (10Gbps)
    - Baseline approach is a 64 x 200Mbps HSTL connection with parallel control

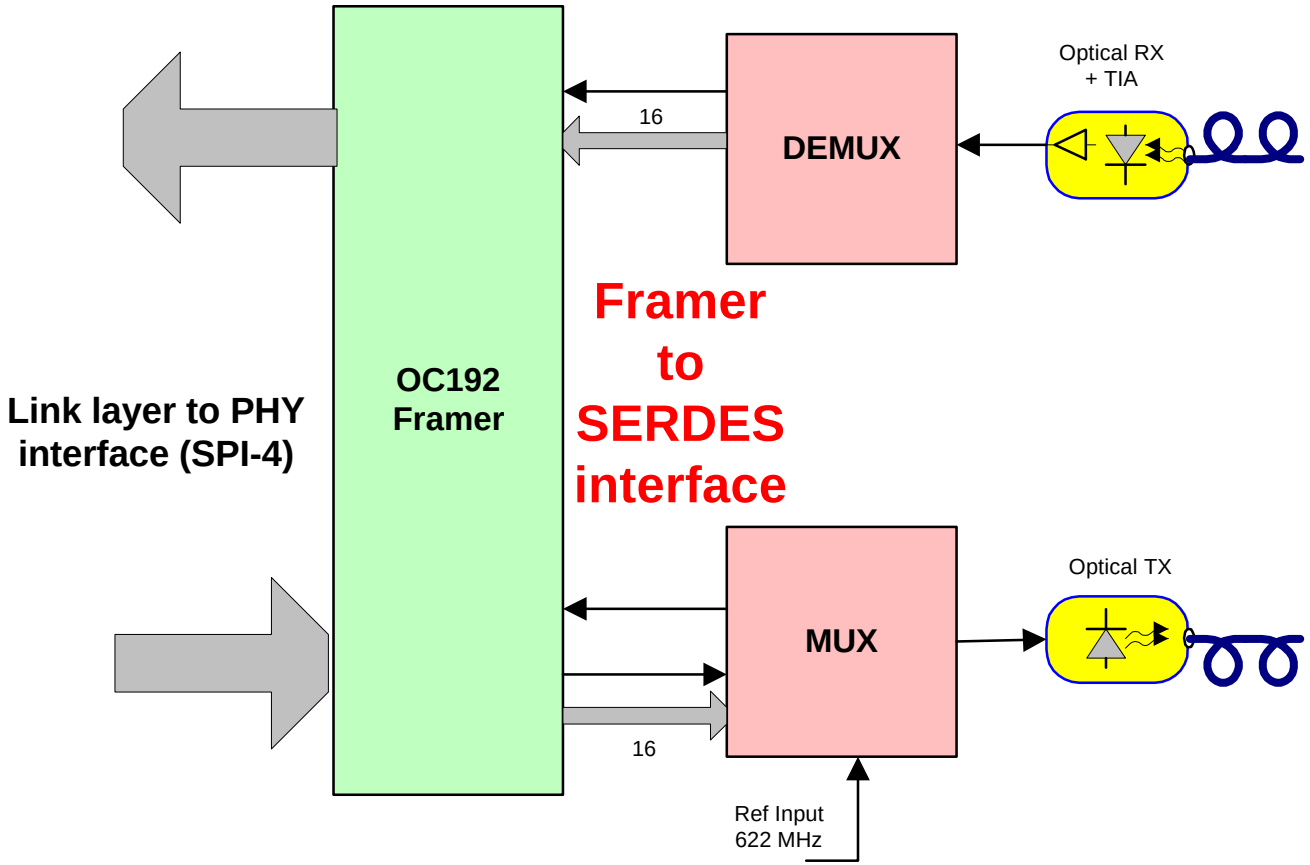
OIF PHY/SERDES interfaces



SERDES Interface

- This interface is between a serializer / deserializer and a SONET framer
- Baseline definition is a 16x622Mbps LVDS (Low Voltage Differential Signal) interface

OIF PHY/SERDES interfaces



HSSG / OIF Cooperation

- The most obvious common points of interest are:
  - WAN PHY interface specification
  - Framer to SERDES interface definition
  - Low cost 10 Gbps link specifications
    - Parallel fiber link
    - Low cost Serial link
    - OIF is currently pursuing 400m and 2km interconnects