GEOS-10 Product Brief

NUVATION

Gigabit Ethernet to SONET 10:1 Multiplexer

The GEOS-10 IP core multiplexes GbE traffic into a single SONET stream, using frame-mapped GFP (Generic Framing Procedures). The GEOS-10 core is designed to interface with a 10-Port Gigabit Ethernet MAC (Intel® IXF1110, PMC-Sierra PM3388 S/UNI®-10xGE) and a 10Gbit/s LAN/WAN Physical Layer Device (Intel® IXF1810x family, PMC-Sierra PM5390 S/UNI®-9953), using Altera® POS-PHY Level 4 cores. The core is optimized for the Altera® APEX™ II device architecture.

Features

- Supports up to OC-192 bandwidth
- Multiplexes up to 10 ports of Gigabit Ethernet (GbE) traffic into SONET
- Full duplex pause flow control
- Configurable destination port address
- Complies with Frame Mapped Generic Framing Procedures from ITU-T.
- Provides GbE Traffic Statistics per port
- Plug & Play with Altera® POS-PHY Level 4 cores and Altera® APEX-II, scalable to 10 Gig-E
- Optimized for integration with a 10-Port GbE MAC (Intel® IXF1110, PMC-Sierra PM3388 S/UNI®-10xGE) and a 10Gbit/s LAN/WAN PHY (Intel® IXF1810x family, PMC-Sierra PM5390 S/UNI®-9953)
- Verilog HDL register transfer level (RTL) code available

Interface and Protocols

- Atlantic Interface
- AIRBus: 16-bit slave
- Frame Mapped GFP

System Implementation

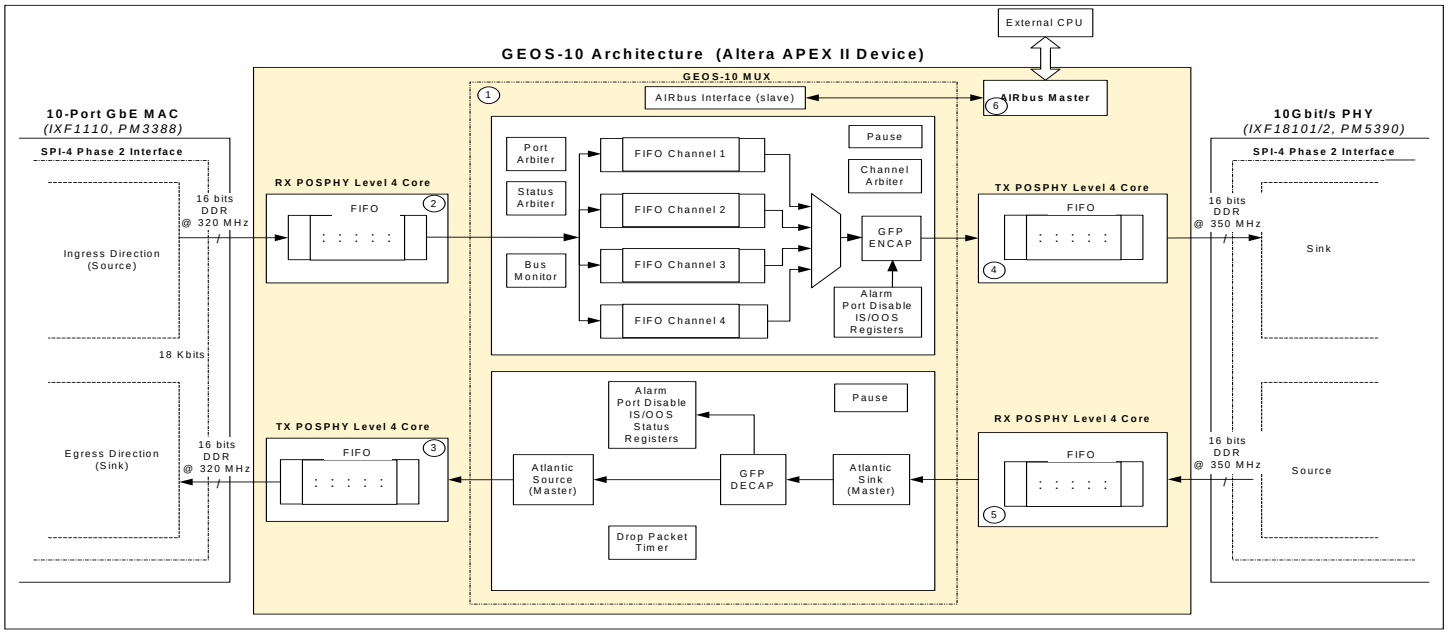

Figure 1: GEOS-10 Architecture

Data Flow

INGRESS: *Ethernet-to-SONET*

- Controlled by ESMUX module
- Automatic generation of GFP header w/ destination port ID
- Pause information transfer to destination ports

EGRESS: *SONET-to-Ethernet*

- Controlled by SEDEMUX module
- De-multiplexes traffic from SONET side into 10 GbE ports
- Routes packets to their corresponding ports
- Extracts pause information from control packets
- Asserts/de-asserts "pause" signal on each GbE port

GEOS-10 Architecture Blocks

1) GEOS-10 core
2) POS-PHY Level 4 Core, in RX mode, interfacing to a 10x1GbE multi-port capable PHY. This core is interfaced to the GEOS-10 core.
3) POS-PHY Level 4 Core, in TX mode, interfacing to a 10x1 GbE multi-port capable PHY. This core is interfaced to the GEOS-10 core.
4) POS-PHY Level 4 Core, in TX mode, interfacing to an OC-192 single port PHY. This core is interfaced to the GEOS-10 core.
5) POS-PHY Level 4 Core, in RX mode, interfacing to an OC-192 single port PHY. This core is interfaced to the GEOS-10 core.
6) CPU Interface Core, interfacing to the GEOS-10 through an AIR-Bus Interface.

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