

Gigabit Ethernet to SONET 2+2:1 Multiplexer

The GEOS-2+2 IP core multiplexes GbE and Fast Ethernet traffic into a single SONET stream, using frame-mapped GFP (Generic Framing Procedures). The GEOS-2+2 core is designed to interface with a Quad-Port 10/100/1000 Mbps MAC/PHY (Intel® IXF1104) and a 2.488Gbit/s SONET/SDH Framer device (PMC-Sierra PM5381 S/UNI®-4x622), using Altera® POS-PHY Level 3 cores. The core is optimized for the Altera® Cyclone™ device architecture.

Features	Interface and Protocols
<ul style="list-style-type: none"> • Supports up to OC-48 bandwidth • Multiplexes up to 2 ports of Gigabit Ethernet (GbE) traffic plus up to an additional 2 ports of Fast Ethernet (FE) traffic into SONET • Side band half duplex pause flow control available • Configurable destination port address • Complies with Frame Mapped Generic Framing Procedures from ITU-T. • Provides GbE/FE Traffic Statistics per port • Plug & Play with Altera® POS-PHY Level 3 cores and Altera® Cyclone, scalable to 2 Gig-E plus 2 FE • Optimized for integration with a Quad-Port GbE MAC (Intel® IXF1104) and a 2.488 Gbit/s SONET/SDH Framer (PMC-Sierra PM5381 S/UNI®-4x622) • Encrypted Netlist available 	<ul style="list-style-type: none"> • POS-PHY Level 3 • Atlantic Interface • AIRBus: 16-bit slave • Frame Mapped GFP

System Implementation

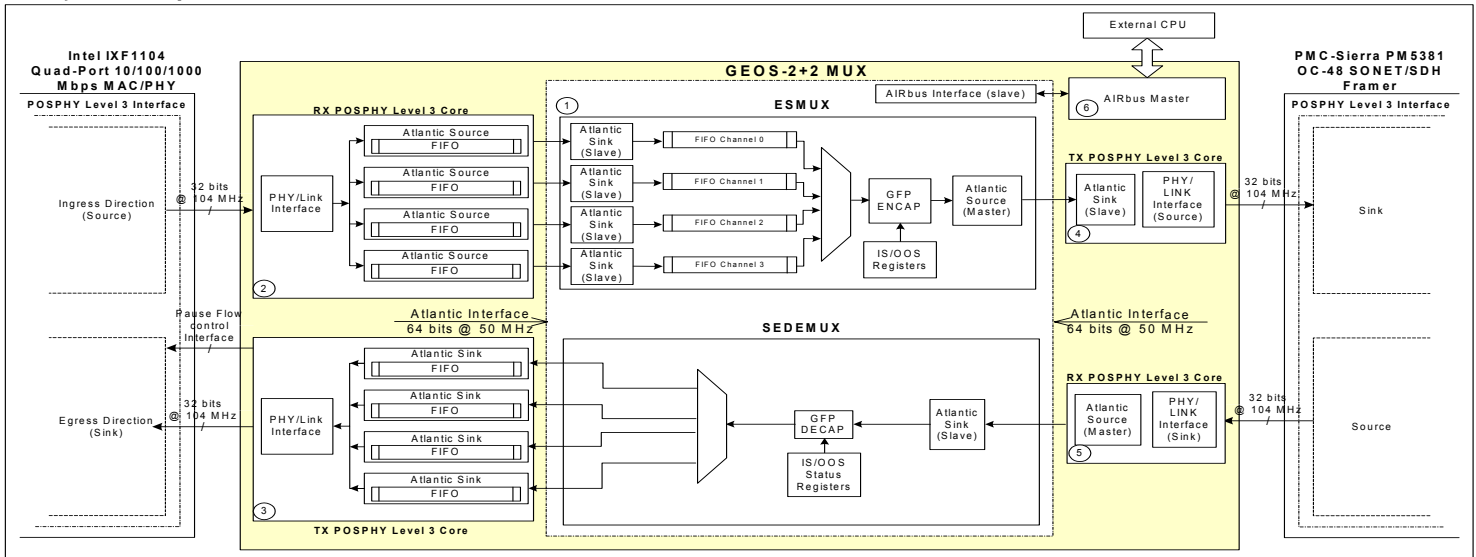


Figure 1: GEOS-2+2 Architecture

Data Flow	GEOS-2+2 Architecture Blocks
<p>INGRESS: Ethernet-to-SONET</p> <ul style="list-style-type: none"> • Controlled by ESMUX module • Automatic generation of GFP header with destination port ID • Pause information transfer to destination ports <p>EGRESS: SONET-to-Ethernet</p> <ul style="list-style-type: none"> • Controlled by SEDEMUX module • De-multiplexes traffic from SONET side into 2 GbE plus 2 FE ports • Routes packets to their corresponding ports 	<ol style="list-style-type: none"> 1) GEOS-2+2 core 2) POS-PHY Level 3 Core, in RX mode, interfacing to a Quad-Port 10/100/1000 Mbps capable MAC/PHY. This core is interfaced to the GEOS-2+2 core. 3) POS-PHY Level 3 Core, in TX mode, interfacing to a Quad-Port 10/100/1000 Mbps capable MAC/PHY. This core is interfaced to the GEOS-2+2 core. 4) POS-PHY Level 3 Core, in TX mode, interfacing to an OC-48 single port SONET/SDH framer. This core is interfaced to the GEOS-2+2 core. 5) POS-PHY Level 3 Core, in RX mode, interfacing to an OC-48 single port SONET/SDH Framer. This core is interfaced to the GEOS-2+2 core. 6) CPU Interface Core, interfacing to the GEOS-2+2 through an AIR-Bus Interface.