PEX 8616 Vitals

- 16-lane, 4-Port PCIe Gen 2 Switch
  - Integrated 5.0 GT/s SerDes
- 19 x 19mm^2, 324-pin FCBGA package
- Typical Power: 2.1 Watts

PEX 8616 Key Features

- **Standards Compliant**
  - PCI Express Base Specification, r2.0 (backwards compatible w/ PCIe r1.0a/1.1)
  - PCI Power Management Spec, r1.2
  - Microsoft Vista Compliant
  - Supports Access Control Services
  - Dynamic Link-Width control
  - Dynamic SerDes speed control
- **High Performance**
  - Dynamic Buffer Pool architecture
  - Read Pacing (Rd_Req throttling)
  - Dual-Cast
  - Packet Cut-Thru with 150ns max packet latency (x4 to x4)
  - 2KB Max Payload Size
  - Non-blocking switch fabric
  - Full line rate on all ports
- **Flexible Configuration**
  - Ports configurable as x1, x2, x4, x8
  - Registers configurable with strapping pins, EEPROM, I^{2}C, or host software
  - Lane and polarity reversal
  - Compatible with PCIe 1.0a PM
- **Dual-Host & Fail-Over Support**
  - Configurable Non-Transparent port
  - Moveable upstream port
  - Crosslink port capability
- **Quality of Service (QoS)**
  - Eight traffic classes per port
  - Weighted Round-Robin source port arbitration
- **Reliability, Availability, Serviceability**
  - 2 Hot Plug Ports with native HP Signals
  - All ports hot plug capable thru I^{2}C (Hot Plug Controller on every port)
  - ECRC and Poison bit support
  - ECC check on Data Path
  - Memory (RAM) Error Correction
  - INTA# and FATAL_ERR# signals
  - Advanced Error Reporting
  - Port Status bits and GPIO available
  - Per port error diagnostics
  - Performance Monitoring
    - Per port payload & header counters
  - JTAG AC/DC boundary scan

Application:

Host Bus Adapters

PLX Product:

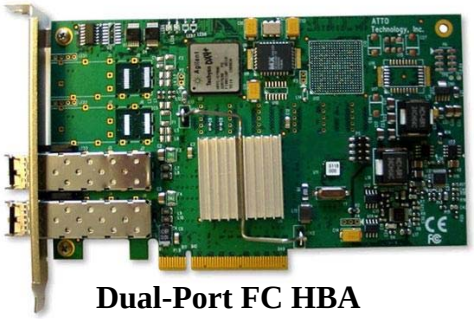
PEX 8616 – 16-Lane PCIe Gen 2 Switch

Key Benefit:

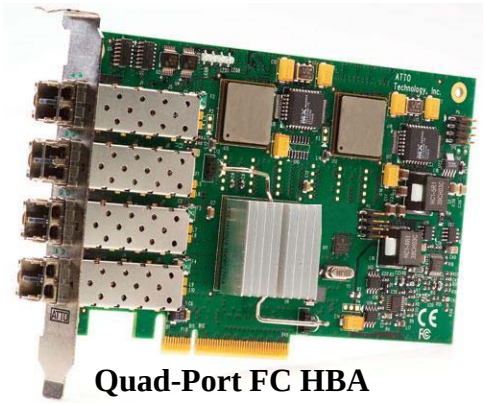
High Performance Fan-Out

Host Bus Adapters

Not too long ago, Host Bus Adapters (HBA) providing interfaces such as Fibre Channel (most common), SCSI, and SATA, among others, employed a PCI or PCI-X interface to connect to the host bus. Over the last couple of years, HBA designers have been upgrading their architectures to PCI Express (PCIe), increasing performance, scalability, and ease of board design. Today, HBA designers are on the move again… this time to PCIe Gen 2. System designs continue to become more and more robust, increasing throughput requirements across all system components. PCI Express Gen 2 equips a data rate of 5.0 GT/s, doubling the data rate of PCIe Gen 1 (2.5 GT/s). PCIe Gen 2 data rates will prove to be critical for designers wanting to take their Fibre Channel (FC) HBA data rates from 4Gb/s up to 8Gb/s. While the vast majority of today's FC HBAs are running at 4Gb/s, the FC HBAs of tomorrow will undoubtedly be moving to 8Gb/s. With the introduction of PCIe Gen 2 switches, HBA designers are designing their next generation HBAs with PCIe Gen 2 so that when the market is ready to move to 8Gb/s, and as 8Gb/s FC Controllers become mainstream, their designs will be ready to support the 8Gb/s data rates using PCIe Gen 2. As HBAs evolve, another transition taking place is the one from Dual-Port FC HBAs to Quad-Port FC HBAs. Whereas Dual-Port HBAs provided sufficient connectivity in the past, today's servers and



Dual-Port FC HBA



Quad-Port FC HBA

storage area networks (SANs) have increasingly stringent I/O connectivity requirements, utilizing multiple I/O and CPU blades. By increasing the number of FC I/O interfaces (ports) from 2 to 4, the FC HBAs reduce the number of I/O blades required by the system. Instead of having to employ yet another I/O blade, the system can instead employ one more CPU blade to help with application processing, enhancing overall system performance. These additional two FC ports are created by utilizing a PCIe switch to fan-out to two FC Controllers, instead of using just one.

PEX 8616 – PCIe Gen 2 Switch

The PEX 8616, a 16-lane, 4-port PCIe Gen 2 switch based on PLX's 4th generation switch architecture, is an ideal solution for Quad-Port FC HBAs. Optimized for high performance fan-out communication, the PEX 8616 draws on PLX's dynamic buffer pool allocation scheme allowing for faster credit updates, hence producing the industry's highest performing switches. Furthermore, the PEX 8616 also utilizes PLX's renowned Cut-Thru architecture, well-known for yielding the industry's lowest max packet latency (150ns for PEX 8616).

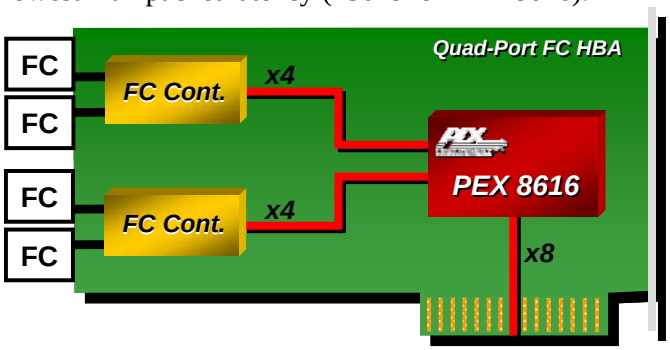


Figure 1. Quad-Port FC HBA using PEX 8616

The PEX 8616 can be used in Quad-Port FC HBAs to fan-out to two FC Controllers, each controlling two FC interfaces (ports). A typical usage model is shown in Figure 1, where two x4 links are used to fan-out to the FC Controllers, while a x8 link is used to connect to the host via PCIe. The wider x8 upstream link minimizes the risk of a bottleneck and ensures traffic flows efficiently to and from the 4 FC ports.

The PEX 8616 also features many exclusive and industry leading features such as Read Pacing and Dual Cast. Be sure to reference the PEX 8616 Product Brief, Data Book, White Papers, and other documentation at www.plxtech.com.

Gen 2 Switches Sampling in Q4 2007!

PLX is shipping 21 PCIe Gen 1 switches & bridges today! More information on these can be found at www.plxtech.com/pcie . Below is a list of announced Gen 2 switches PLX will be sampling in Q4 2007:

Device	Lanes	Ports	Availability
PEX 8648	48	12	Q4 2007
PEX 8632	32	12	Q4 2007
PEX 8624	24	6	Q4 2007
PEX 8616	16	4	Q4 2007
PEX 8612	12	3	Q4 2007

Design Tools & Documentation:

www.plxtech.com/8616

- Product Brief
- Data Book
- Design Notes & White Papers
- Rapid Development Kit (RDK) Schematics
- Rapid Development Kit (RDK) Gerber Files
- RDK Hardware Reference Manual
- Software Development Kit
- HSPICE Models
- OrCAD Library

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