

The goal of any switch within a network is to first transfer data, as directed, between nodes within the system. The second goal is to perform this task with minimal degradation on the network. The PLX series of switches provide efficient operation in any network with minimal loss in performance. The enclosed document shows an example of a PCI Express host running a Gigabit Ethernet network. A PLX switch is added to the network and the resultant system degradation is tested.

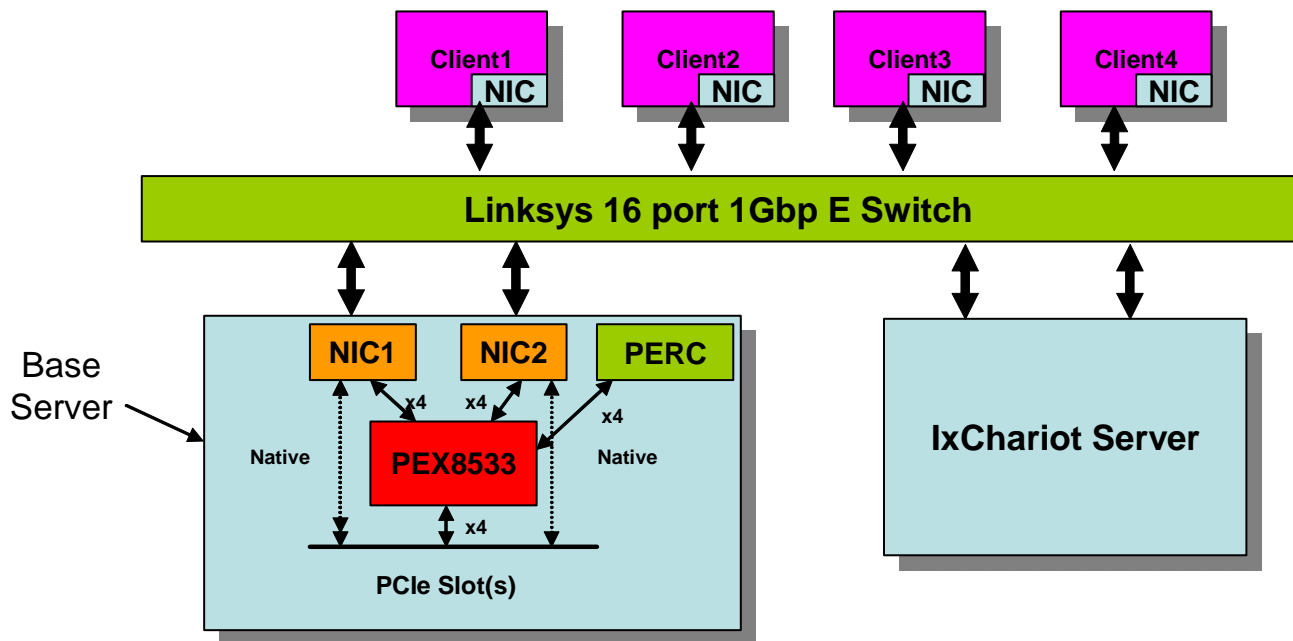


Figure 1: PEX 8533 Configuration

The test environment consists of a base server with a PCI Express root complex and I/O ports. In native operation, the downstream server (root complex) accepts the x4 upstream inputs of two separate Network Adapter cards directly. The Network Adapter Cards convert traffic from PCIe to Gigabit Ethernet and feed the Ethernet traffic to a 16 port Ethernet system switch. The switch then transfers data to the four client devices. To verify the impact of the PLX PCIe switch, the NICs are connected to the switch downstream ports and the switch upstream port is maintained as x4 to the root complex.

Chariot GigE monitoring software is then used to compare the network performance before and after the insertion of the PLX switch. Tests include random and dedicated Ethernet packet lengths so that packet effects/efficiencies can be observed. Data traffic of the -- both with and without -- PLX PCIe switch is averaged over several runs to provide statistical accuracy.

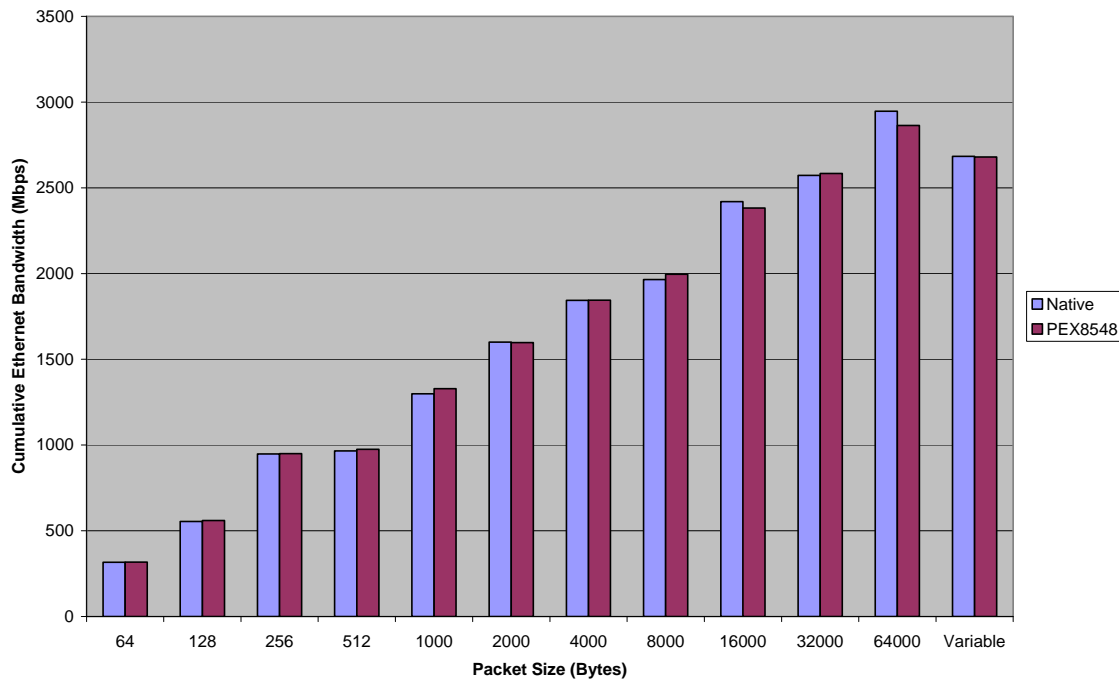


Figure 2: PLX PCIe Switch Throughput Results

Chariot records the aggregate bandwidth of the composite network back through the root complex. With two NICs, each operating at 1Gbps in each direction, the maximum theoretical data bandwidth of the link is 4 Gbps (Note the GigE composite line rate would be 5Gbps). With the client side lightly loaded with only 4 devices, the effects of packet size can be clearly demonstrated. The efficiency of the network improves with larger packets (Increasing the number of clients would show an asymptotic saturation of the link, but mask the dependency on packet size).

With regards to system impact due to the addition of a PCIe switch, with the PLX PCIe Switch inserted, no appreciable degradation of system bandwidth was observed.

A high-performance PLX switch makes the job of everything else in the PCIe component infrastructure easier. PLX's (PEX 8548, PEX 8547, PEX 8533 and PEX 8525) family of switches should be the first choice of system engineers interested in producing high-performance systems. Latency, power and other key parameters are discussed in additional white papers found on the PLX website.