EMULEX

Emulex LPe12000 8Gb/s HBA Outperforms Brocade 815

LightPulse LPe12000 HBA Delivers Optimum Performance with Mixed I/O Benchmark Tests

At a Glance

Emulex® conducted a series of benchmark tests to compare the performance of Emulex and Brocade 8Gb/s HBAs using mixed loads of small and large block sizes. The tests were designed to simulate real-world applications like Microsoft Exchange and SQL Server.

The Emulex LightPulse® LPe12000 8Gbs HBA produced substantial performance benefits in total I/O, CPU effectiveness and response time versus the Brocade 815. As shown in the study, Emulex HBAs deliver industry-leading performance for maximum productivity and cost savings.

The Emulex LightPulse LPe12000 family of 8Gb/s HBAs is available in standard single-port, dual-port and quad-port configurations and a wide range of form factors for blade servers. Emulex HBAs deliver industry-leading performance that drives maximum productivity and cost savings for the data center.

Introduction

With increased pressure to provide more computing capabilities at lower costs, IT managers are looking to achieve maximum efficiencies for server and storage resources. When server virtualization is part of the strategy, there is added incentive to optimize performance for every application running in a virtual machine.

A storage area network (SAN) based on the Fibre Channel protocol is typically used to provide high-performance, shared storage for business-critical applications, particularly with virtual server deployments. The host bus adapter (HBA), which provides the connection from the server to the SAN, is a critical component that should support high I/O rates with minimum use of CPU resources.

With these concerns in mind, Emulex conducted a series of benchmark tests to compare the performance of Emulex and Brocade 8Gb/s HBAs. Rather than artificially measure maximum I/O rates, the goal was to simulate real-world applications like Microsoft Exchange and SQL Server.

The evaluation was done with the following test environment using currently available driver and firmware versions from Emulex and Brocade:

Host Server:
- HP DL380G6 (2P 2.97GHz, 8 cores)
- 16 GB RAM

Operating System:
- Windows Server 2008 Enterprise x64 Edition SP1

Storage:
- ThirdIO IRIS
- Emulex LightPulse LPe12002 8Gb/s HBA
- Brocade 815 Gb/s HBA

Performance Measurement:
- IOMeter I/O Load Generator

Test Procedure

In order to simulate real-world environments, IOMeter was used to do reads and writes with commonly used block sizes while simultaneously doing writes with 64Kb blocks. This combination of small and large blocks is a typical workload for Exchange and SQL servers.

As detailed below, the Emulex LPe12000 outperformed the Brocade 815 in all tests.

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I/O Throughput

I/O throughput was measured as total IOPs for a combination of small block read/writes and large block writes, with most of the I/O being small block read/writes. This would be analogous to a SQL Server environment with simultaneous small block database access and large block writes to a log file.

As shown in Figure 1, the Emulex LPe12000 averaged 67% higher IOPs than the Brocade 815. This is due in part to the frame-level multiplexing capability of Emulex HBAs, which allows large I/O frames to be processed as multiple smaller blocks that are interspersed with smaller I/O frames.

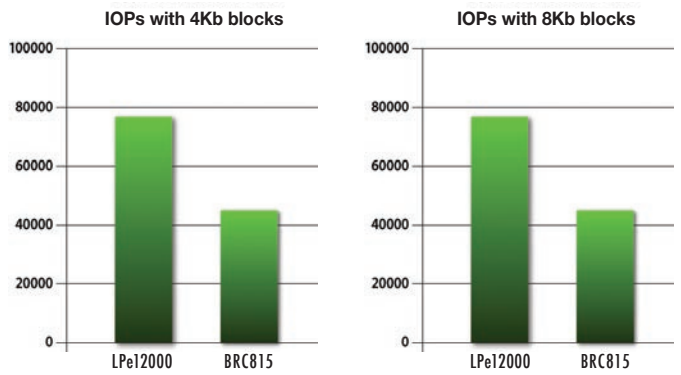

Figure 1 – 67% higher IOPs with Emulex LPe12000

CPU Effectiveness

CPU effectiveness was calculated by dividing IOPs by the percent of CPU used for I/O. This value is particularly critical with server virtualization where higher CPU effectiveness enables higher virtualization ratios and greater cost savings.

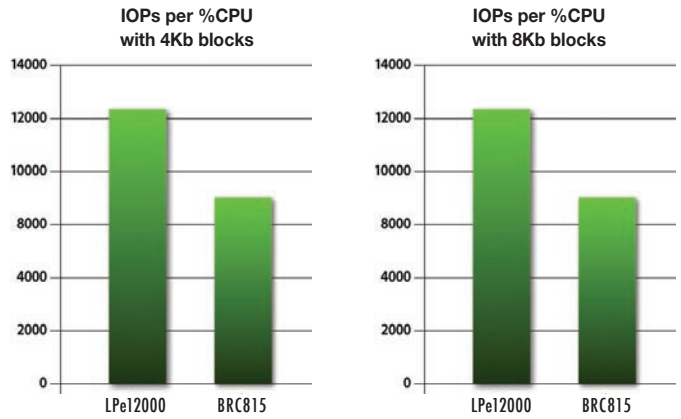

Figure 2 - 35% better CPU effectiveness with Emulex LPe12000

As shown in Figure 2, the Emulex LPe12000 had 35% better CPU effectiveness than the Brocade 815.

Response Time

Response time was measured as the time required to complete a 4Kb or 8Kb read and write with simultaneous 64Kb write activity. This is a critical factor for applications like Exchange or SQL Server where interactive users are waiting for I/O activity to complete.

Figure 3 shows the response time reported in milliseconds, with the Emulex LPe12000 averaging 75% faster response time.

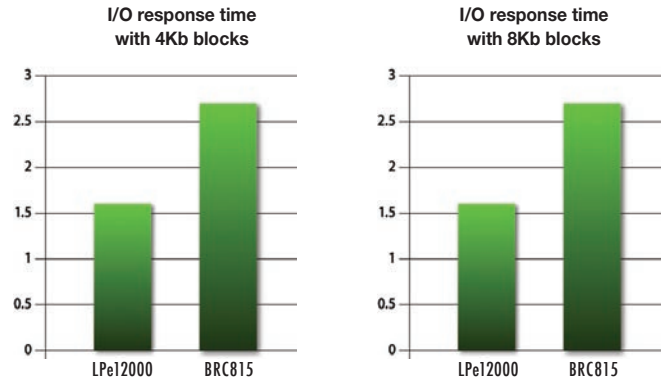

Figure 3 - 70% faster response time with Emulex LPe12000

Conclusion

Benchmark tests were done using 4Kb and 8Kb block sizes to simulate Microsoft Exchange and SQL Server environments. The Emulex LPe12000 8Gbs HBA achieved substantial performance benefits in total I/O throughput, CPU effectiveness and response time versus the Brocade 815. This best-in-class performance is a critical factor when choosing components for a SAN infrastructure that supports business-critical, real-world applications.

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