



Emulex LPe12000 and Intel Xeon Processor 5500 Performance Benchmark

DUAL-CHANNEL LPe12002 8Gb/s HBA OUTPERFORMS THE COMPETITION

Highlights

- 225% increase in IOPs per GHz of CPU resource for Intel Xeon processor 5500 series with Emulex LPe12000 8Gb/s Fibre Channel HBAs
- 3.4 times maximum IOPs for Intel Xeon processor 5500 series with Emulex LPe12000 8Gb/s Fibre Channel HBAs
- 21% higher read IOPs and 29% higher write IOPs for Emulex LPe12002 8Gb/s Fibre Channel HBAs when compared with QLogic QLE2562 8Gb/s Fibre Channel HBAs

Introduction

The Intel® Xeon® processor 5500 series (codenamed Nehalem-EP) combines new processor and platform architectures with new memory and I/O subsystems to provide substantial improvements in server performance. Each processor has an integrated memory controller with dedicated memory and links to other processors and the I/O hub using high-speed Intel QuickPath Interface (QPI) connections. When combined with other features such as PCI-Express 2.0, Intel Hyper-Threading Technology and Virtualization Technology for Directed I/O (VT-d), the result is a quantum improvement in performance.

The Emulex® LightPulse® LPe12000 8Gb/s HBA family uses an advanced ASIC design that complements the Intel Xeon processor 5500 series. The LPe12000 family also leverages the Non-Uniform Memory Access (NUMA) architecture of the Xeon 5500 series by using individual interrupt processes for each port and directing interrupts back to the CPU and local memory that initiated the I/O.

Emulex conducted a series of I/O benchmarks with Emulex LightPulse 8Gb/s HBAs to evaluate storage performance with an Intel Xeon processor 5500 series server. These tests were designed to evaluate:

- Relative performance between the Intel Xeon processor 5500 series and the Intel Xeon processor 5300 series
- Relative performance between Emulex LightPulse LPe12002 8Gb/s Fibre Channel HBAs and QLogic® QLE2562 8Gb/s Fibre Channel HBAs with the Intel Xeon processor 5500 series

Intel Xeon 5500 and Intel Xeon 5300 Comparison

This comparison was done with the following systems:

Intel Xeon 5500 processor-based server:

- 2 CPUs - 2.93 GHz Xeon 5570 quad core
- Hyper-threading on
- Emulex LPe12000 8Gb/s Fibre Channel HBA(s)
- Windows Server 2008

Intel Xeon 5300 processor-based server:

- 2 CPUs - 2.66 GHz Xeon 5355 quad core
- Emulex LPe12000 8Gb/s Fibre Channel HBA(s)
- Windows Server 2008



Emulex LPe12000 and Intel Xeon Processor 5500 Performance Benchmark

Figure 1 shows a comparison of CPU effectiveness for read operations with a 512-byte data block size. CPU effectiveness is shown as I/O's per second (IOPS) per GHz of CPU resource. Test results showed a 225% increase in IOPS for the Xeon 5570.

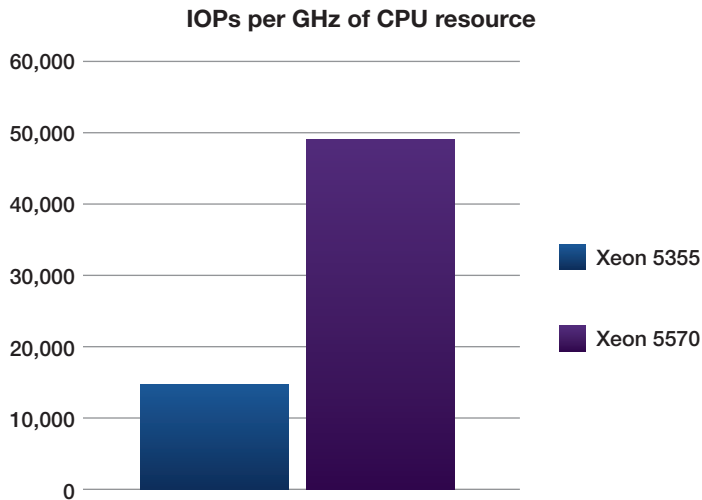


Figure 1 Emulex 8Gb/s LPe12000 provides 225% better performance with Intel Xeon 5570.

A second series of 512-byte data block tests was done with multiple Emulex LPe12000 HBAs to compare maximum I/O rates. As shown in Figure 2, the result was an impressive 3.4 times maximum IOPS with the Xeon 5570, breaking the 1 million IOPS barrier.

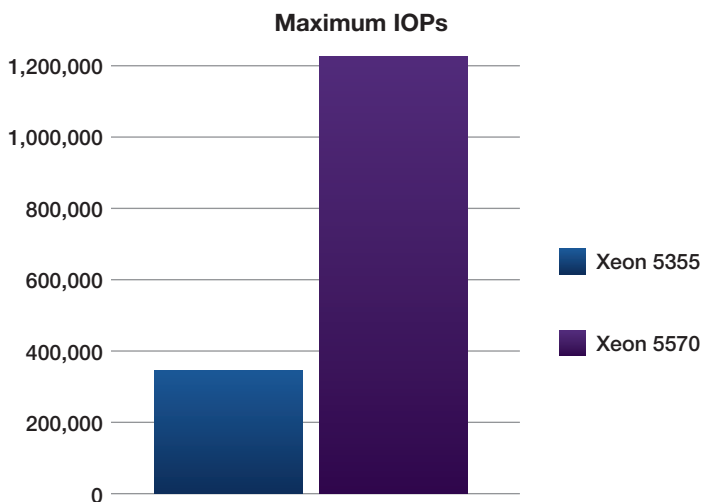


Figure 2 Multiple Emulex 8Gb/s HBAs provide 3.4x maximum I/O with Intel Xeon 5570.

Emulex and QLogic 8Gb/s HBAs Comparison

This comparison was done using multiple dual-channel Emulex LightPulse LPe12002 8Gb/s Fibre Channel HBAs and QLogic QLE2562 8Gb/s Fibre Channel HBAs with the following system:

Intel Xeon 5500 processor-based server:

- 2 CPUs - 2.93 GHz Xeon 5570 quad core
- Hyper-threading on
- Windows Server 2008

The tests measured maximum I/O's per second (IOPS) with different data block sizes. The results showed:

- 21% higher maximum read IOPS for Emulex LPe12002 with 8Kb block size (typical block size for many applications such as Oracle Database, Microsoft SQL Server and Microsoft Exchange).
- 29% higher maximum write IOPS for Emulex LPe12002 with 4Kb block size
- 7% higher overall IOPS for Emulex LPe12002 with 512b block size (smaller block size tests highest I/O rate that can be reached)

Conclusions

The combination of Emulex LightPulse LPe12000 8Gb/s Fibre Channel HBAs and the Intel Xeon processor 5500 series provides better system efficiency for I/O, freeing up CPU processing for business critical applications.

The combination of Emulex LightPulse LPe12000 8Gb/s Fibre Channel HBAs and the Intel Xeon processor 5500 series provides higher maximum I/O rates, providing better support for high I/O applications and highly virtualized servers.

The Emulex LightPulse LPe12002 8Gb/s Fibre Channel HBA provides higher maximum I/O rates for both read and write when compared to the QLogic QLE2562 8Gb/s Fibre Channel HBA.



World Headquarters 3333 Susan Street, Costa Mesa, CA 92626 +1 714 662 5600
Wokingham, UK +44 (0) 118 977 2929 | **Munich, Germany** +49 (0) 89 97007 177
Paris, France +33 (0) 158 580 022 | **Beijing, China** +86 10 68499547

www.emulex.com