SOLUTION BRIEF

Flexibility for Next-Gen Enterprise

Improve data center performance with upgrades to the storage infrastructure.

Boosting Storage Server Performance

A responsive and agile data center requires enterprise connectivity and performance that delivers transformative results. Using servers as storage arrays can offer businesses greater flexibility when it comes to upgrading hardware and managing the data center, but without the right components, these servers may not be able to deliver the top-tier performance needed for today's demanding workloads and applications. In order to reduce bottlenecks and maximize efficiency, businesses should consider upgrading multiple critical data center components together.

By upgrading the storage server with a new processor, replacing SATA SSDs with PCIe* SSDs, and increasing the number of 10GbE network connections at the same time, enterprises gain improved database performance to reduce bottlenecks, strong I/O performance to meet the needs of any task, and quicker response times for improved usability.[1]

Make the Switch from SATA

Long response times resulting from storage bottlenecks can be extremely frustrating for a business with growing data sets. Rather than attempting to meet workload needs with less efficient, space-restrictive SATA-based storage servers, data centers can make the choice to upgrade certain important storage components and dramatically increase performance with comparatively fewer PCIe drives.[1] These drives offer a significant speed advantage—leveraging NVMe* technology, drives from the Intel® SSD DC Family for PCIe are capable of 6x faster data transfer speeds than SATA, delivering real-world transfers of over 5GB/s bandwidth and 4K random read performance up to 850,000 IOPS.[2,3]

Processing Power

The latest-generation Intel® Xeon® processor E5 family offers more cores and cache, faster memory, and lower latency compared to the previous generation.[4,5] By combining an upgrade to new processors from this lineup with storage drive and network upgrades, businesses gain the potential to increase transactions per minute, which can ultimately lead to greater productivity.

6X PCIe* WITH NVMe* FASTER THAN SATA[2]

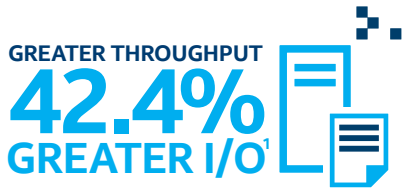
More Bandwidth

As businesses experience increasing needs for bandwidth, networks can become slow and congested. Fortunately, developments in Ethernet technologies have made it easier than ever for your customers to upgrade their connections to take advantage of the benefits of virtualization and server consolidation. With the Intel® Ethernet Converged Network Adapter XL710 Series, enterprises can double the throughput compared to previous generations while alleviating I/O bottlenecks—benefits that may be furthered by moving from one to four 10GbE network connections.[1,6]

Improved Productivity

When businesses upgrade both the processor and network connection, along with making the switch from SATA drives to PCIe drives, they can see significant improvements to productivity, completing 54.5% more transactions per minute.[1] With this dramatic increase, database administrators can rest assured knowing that the new storage server is capable of handling the most demanding workloads, regardless of the task.

This particular combination of upgrades can also deliver 42.4% greater I/O (or greater load) and 1/7 the read latency.[1] That means not only that the new configuration supports scaling of databases or workloads to meet user needs, but also that it can deliver improved application responsiveness.[1]



Better business starts with a better network. Businesses can reduce complexity and start turning data into insight with networking and storage solutions from Intel. Upgrading the processor, storage, and network together can allow easier data center and hardware management, meaning your customers can spend less time waiting on technology and more time innovating.

Build a better network with a new storage infrastructure. Help your customers boost performance and productivity with the right combination of data center upgrades.

Build a Better Network
intel.com/ethernet

Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information, visit intel.com/performance.

Intel is a sponsor and member of the BenchmarkXPRT Development Community, and was the major developer of the XPRT family of benchmarks. Principled Technologies is the publisher of the XPRT family of benchmarks. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases.

1. Based on tests performed by Principled Technologies, December 2014. Report available at http://www.principledtechnologies.com/Intel/Xeon_E5-2600_v3_1014_v2.pdf. Upgraded configuration: Intel® Server Board S2600WTT with 2x Intel® Xeon® processor E5-2695 v3, Microsoft Windows Server* 2012 R2, Intel® SSD DC P3700 Series 800GB (SSDPEDMD800G4), and Intel® Ethernet CNA X710 Series for 10GbE in a 4x10Gbps NIC setup. Base configuration: Dell PowerEdge* R720 with 2x Intel® Xeon® processor E5-2680 v2, Microsoft Windows Server* 2012 R2, Intel® SSD DC S3700 Series 800GB (SSDSC2BA800G), and Intel® Gigabit 10G Quad Port NIC D57446-001 in a 1x10Gbps NIC setup.
2. Based on comparisons of latency, density, and write-cycling metrics amongst memory technologies recorded on published specifications of in-market memory products against internal Intel® specifications. Tests performed by Intel. Configurations: Performance claims obtained from data sheet, sequential read/write at 128k block size for NVMe* and SATA, 64k for SAS. Intel® SSD DC P3700 Series 2TB, SAS Ultrastar* SSD1600MM, Intel® SSD DC S3700 Series SATA 6 Gbps. Intel® Core™ i7-3770K CPU @ 3.50GHz, 8GB of system memory, Windows Server* 2012, IOMeter. Random performance is collected with 4 workers each with 32 QD. For more information, visit http://www.intel.com/content/www/us/en/solid-state-drives/intel-ssd-dc-family-for-pcie-brief.html.
3. Transfer speeds and read performance based on the Intel® SSD DC P3608 specifications. Test performed by Intel. Test and System Configurations: Intel® Core™ i7-4770 CPU at 3.4 GHz, 8GB DDR3 at 1600 MHz, Intel® SSD DC P3608 Series 1.6TB. For more information, visit http://www.intel.com/content/www/us/en/solid-state-drives/ssd-dc-p3608-brief.html.
4. Intel® Xeon® processor E5-2600 v4 product family (up to 22 cores per socket and 55MB LLC cache) compared to previous-generation Intel® Xeon® processor E5-2600 v3 product family (18 cores per socket and 45MB cache). For more info, visit http://www.intel.com/content/dam/www/public/us/en/documents/product-briefs/xeon-e5-brief.pdf.
5. The Intel® Xeon® processor E5-2600 v4 product family supports memory speeds (DDR4 frequency) up to 2400 MT/s versus maximum memory speeds of 2133 MT/s for the Intel® Xeon® processor E5-2600 v3 product family. For more info, visit http://www.intel.com/content/dam/www/public/us/en/documents/product-briefs/xeon-e5-brief.pdf.
6. Throughput compared to the Intel® Ethernet CNA X520 based on a comparison between PCIe* architectures: The Intel® Ethernet CNAs X710/XL710 have a PCIe* 3.0 x8 host interface compared to the Intel® Ethernet CNA X520, which has a PCIe* 2.0 x8 host interface. PCIe* 3.0 doubles the maximum data transfer rate over its predecessor, PCIe* 2.0, with transfer rates up to 8GT/s.

   Summary of bit rates and approximate bandwidths from PCI-SIG:

   PCIe* 2.0 architecture – Raw bit rate: 5.0GT/s. Interconnect bandwidth: 4Gbps. Bandwidth per lane per direction: ~500MB/s. Total bandwidth for x16 link: ~16GB/s.

   PCIe* 3.0 architecture – Raw bit rate: 8.0GT/s. Interconnect bandwidth: 8Gbps. Bandwidth per lane per direction: ~1GB/s. Total bandwidth for x16 link: ~32GB/s.

   Source: "PCI Express 3.0: How does the PCIe 3.0 8GT/s 'double' the PCIe 2.0 5GT/s bit rate?" section from "PCI Express 3.0 Frequently Asked Questions" at https://pcisig.com/faq?keys=3.0. Retrieved July 25, 2016.