

# VMware EVO:RAIL Powered by Intel<sup>®</sup> Architecture

**The VMware EVO:RAIL Hyper-Converged Infrastructure Appliance runs on a hardware foundation based on the Intel<sup>®</sup> Xeon<sup>®</sup> processor E5-2600 product family, the Intel<sup>®</sup> Solid State Drive DC S3710 Series, and the Intel<sup>®</sup> Ethernet Controller X540 family. This cost-effective, innovative solution delivers high performance and reliability while helping lower costs.**

As businesses define their strategies moving toward the Software Defined Data Center (SDDC) of the future, they must have a foundation to build on that they can trust for reliability, performance, and security. To meet those needs, Intel and VMware have continued their nearly 10-year history of joint engineering to collaborate extensively during the development of EVO:RAIL.

Intel engineers have developed a balanced hardware architecture for EVO:RAIL, based on components that have been matched and tested together to provide optimal results. This work helps ensure that the VMware software foundation, which includes Virtual SAN and vSphere\* as its key modules, is well suited to meet increasingly complex customer demands. This brief examines the three main Intel products that are part of EVO:RAIL, including key features and benefits.

## Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 Product Family

The Intel Xeon processor E5-2600 product family helps IT organizations meet increasing business demands, such as supporting growth and accelerating the implementation of new services and applications. These benefits are available to a wide variety of computing challenges, from enterprise and technical computing, to communications, storage, and cloud.

With a 50 percent increase in core count and cache over its predecessor, the Intel Xeon processor E5-2600 product family also includes innovative hardware features such as Intel<sup>®</sup> Advanced Vector Extensions 2 (Intel<sup>®</sup> AVX2) and Intel<sup>®</sup> QuickPath Interconnects (Intel<sup>®</sup> QPI). The processor delivers up to 2.2x the performance of the previous generation.<sup>1</sup>

Intel<sup>®</sup> AVX2 increases performance for enterprise workloads up to 1.9x<sup>2</sup>. New Fused Multiply-Add (FMA) instructions double the floating point operations per second (FLOPS) compared to first-generation Intel AVX, and they double the width of vector integer instructions to 256 bits.

### Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5-2600 Product Family



- Faster intelligence from demanding workloads
- Reduced CapEx and OpEx through enhanced virtualization
- Enhanced reliability and security to protect the business

## Intel® Solid State Drive Data Center S3710 Series

The Intel Solid State Drive (Intel SSD) DC S3710 Series is the state of the art SSD for the data center, combining fast and consistent read/write capabilities with high endurance and strong data protection.

It delivers 4K random-read performance up to 75,000 IOPS and 4KB random-write performance up to 36,000 IOPS<sup>3</sup>. With a 10 percent input/output operations per second (IOPS)<sup>4</sup> distribution and maximum latencies<sup>4</sup> of <500µs for 99.9 percent of the time, the DC S3710 Series delivers quick and consistent command-response times.

These SSDs provide advanced business-data protection from the time data enters the drive until the time it leaves. An advanced error-correction scheme helps ensure data integrity by protecting against possible data corruption in NAND, SRAM, and DRAM memory.

Incorporating High Endurance Technology (HET), the Intel SSD DC S3710 Series delivers single-level cell (SLC) solid state drive-like endurance in a multi-level cell (MLC) SSD package. By combining SSD NAND management techniques and NAND silicon enhancements, the DC S3710 Series supports 10 Drive Writes Per Day (DWPD)<sup>5</sup> over a five-year life span. For the DC S3710 Series 800 GB, that's equivalent to recording over 186 years of HD video over the life of the drive.

### Intel® Solid State Drive DC S3710 Series



- Accelerated business applications based on diverse data
- Improved scalability with fast data stores
- Enhanced responsiveness for business users

## Intel® Ethernet Controller X540 family

Intel Ethernet 10-Gigabit Controllers accelerate traffic with processor offloads and other performance optimizations, and they support rapid provisioning of networks in an agile data center with capabilities such as configurability in software.

The Intel Ethernet Controller X540 family provides dual 10-Gigabit Ethernet ports with a PCI Express\* x8 interface to the system board. Flow separation for virtual machines alleviates hypervisor I/O bottlenecks, helping drive up performance on demanding enterprise workloads.

Converging data and storage onto one fabric eliminates the need for multiple adapters and cables per server, while 10-Gigabit Ethernet provides the bandwidth necessary to converge these fabrics. Traffic-class separation based on Data Center Bridging (DCB) provides virtual pipes, for multiple traffic flows over a single wire.

### Intel® Ethernet Controller X540 Family



- Flexibility for evolving data centers
- Acceleration for high data throughput
- End-to-end performance benefits with matched I/O

**For high performance, reliability, and security from a cost-effective solution, businesses of all types and sizes can depend on EVO:RAIL deployments powered by the Intel Xeon processor E5-2600 product family, Intel Solid State Drive DC S3710 Series, and Intel Ethernet Controller X540.**

<sup>1</sup> Source as of August 2014. Baseline configuration: Cisco Systems\* UCS C240 M3 with two Intel® Xeon® Processor E5-2697 v2, Java\* Standard Edition 7 Update 45, source. Score: 63,079 SPECjbb\*2013-MultiJVM max-jOPS, 23,797 SPECjbb\*2013-MultiJVM critical-jOPS. New configuration: Intel® Server Board S2600WTT with two Intel® Xeon® Processor E5-2699 v3, Java\* Standard Edition 8 Update 5, source. Score: 139,511 SPECjbb\*2013-MultiJVM max-jOPS, 43,107 SPECjbb\*2013-MultiJVM critical-jOPS.

<sup>2</sup> Source as of August 2014 TR#3034 on Linpack\*. Baseline configuration: Intel® Server Board S2600CP with two Intel® Xeon® Processor E5-2697 v2, Intel® HT Technology disabled, Intel® Turbo Boost Technology enabled, 8x8GB DDR3-1866, RHEL\* 6.3, Intel® MKL 11.0.5, score: 528 GFlops. New configuration: Intel® Server System R2208WTTYS with two Intel® Xeon® Processor E5-2699 v3, Intel® HT Technology disabled, Intel® Turbo Boost Technology enabled, 8x16GB DDR4-2133, RHEL\* 6.4, Intel® MKL 11.1.1, score: 1,012 GFlops.

<sup>3</sup> Based on the Intel® SSD DC S3710 Series Product Specification.

<sup>4</sup> Device measured using IOMeter\* with 4K Random Writes QD=32 across 100% span of the drive. Latency measured using write transfer size of 4KB (4,096 bytes) and queue depth set to 1.

<sup>5</sup> Based on JESD218 standard.

Intel technologies may require enabled hardware, specific software, or services activation. Check with your system manufacturer or retailer.

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