



Storage Optimized for Highest Performance and Performance-per-Watt

Introducing New Metastor vMAX and Omega H/A Ultra-Dense 160 Gb/s Performance Product Families

Industry's Broadest Family of Green Server Systems

Metastor introduces the IT industry's broadest portfolio of new generation servers, demonstrating the highest performance, energy efficiency, and cost effectiveness. The performance and efficiency gains of three Metastor MetaSERV® systems were measured with the latest generation Intel® Xeon® E5-2650 v4 "Broadwell" CPUs versus previous generation E5-2650 v3 "Haswell" CPUs. The servers tested included representative 1U, 2U, and 4U systems. System performance was measured with the High Performance LINPACK (HPL) benchmark and system Power Efficiency was measured using power meter wattage*.

1U Data Center Optimized (DCO) System

The new 1U MetaSERV® MCU-2HAX-MDR DCO system supports up to 1TB of DDR4-2400MHz ECC 3DS LRDIMM or RDIMM memory in 8 DIMM slots, 1 PCI-E 3.0 x8 (FHHL) slot, 2 fixed 2.5" SATA 3.0 (6Gbps) drive bays, dual GbE LAN port, and IPMI 2.0 + KVM with dedicated LAN, and the latest Intel® Xeon® E5-2600 v4 processor product family.

With an innovative thermal architecture that utilizes power efficient components, offset processors to help eliminate CPU preheating, and highest-efficiency power supplies to support higher operating temperatures, DCO systems deliver the best performance-per-watt to complement modern energy efficient data center designs.

The E5 v4 based DCO system (Figure 1) delivered 27% better performance and 27% better performance-per-watt than the E5 v3 based DCO system, as shown Table 1.



Figure 1: Metastor DCO (MCU-2HAX1U-MDR)

Test	MCU-2HAX1U-MDR CPU		% Improvement
	E5-2650 v4	E5-2650 v3	
Performance (GFLOPS)	814.3	642.4	27%
Power (Watts)	307.7	309.0	
Performance per Watt	2.65	2.08	27%

Table 1: DCO Benchmark Results

2U StorDUO^{2™} System

The new generation Metastor 2U QuadHA™ MCU-4HAX-HTR with 4 DP nodes in 2U provides, per node, up to: 2TB of DDR4-2400MHz ECC 3DS LRDIMM or RDIMM memory in 16 DIMM slots; PCI-E 3.0 x16 for add-on card solutions such as PCI-E SSD, dual 10GbE with SFP+, 10GBase-T, InfiniBand, or Gigabit Ethernet/100GbE networking options; and 6 SAS3 (12Gbps) 2.5" hot-swap HDD/SSDs per node; IPMI 2.0 + KVM with dedicated LAN; SuperDOM; and TPM header. The 2U StorDUO^{2™} supports redundant 2000W Titanium Level (96%+) Digital power supplies and each node supports the latest Intel® Xeon® processor E5-2600 v4 product family.

The 2U StorDUO^{2™} architecture builds on Supermicro's proven Twin technology to provide the highest throughput storage, networking, I/O, memory, and processing capabilities in 2U. This allows customers to further optimize Metastor solutions to solve their most challenging IT requirements.

The E5 v4 based 2U StorDUO^{2™} system shown in Figure 2 demonstrated a 26% improvement in performance over the identical system configured with previous generation E5 v3 CPUs and memory. Performance-per-watt was also significantly higher at 29% with the new generation system. These data are shown in Table 2.



Figure 2: Metastor QuadHA™ (MCU-4HAX2U-HTR)

Test	MCU-4HAX2U-HTR CPU		% Improvement
	E5-2650 v4	E5-2650 v3	
Performance (GFLOPS)	818.2	647.3	26%
Power (Watts)	329.9	336.5	
Performance per Watt	2.48	1.92	29%

Table 2: 2U StorDUO^{2™} Benchmark Results

4U StorNode™ Front I/O System

The Metastor StorNode™ MCU-8HAX4U-FTL is a 4U, 8 hot-plug node system that supports, per-node, up to 1TB of DDR4-2400MHz ECC 3DS LRDIMM or RDIMM memory in 8 DIMM slots, 1 PCI-E 3.0 x16 LP slot, 4 ports of SATA 3.0 (6Gbps) with Intel® C612 controller, dual Gigabit Ethernet ports, integrated IPMI 2.0 with KVM over dedicated LAN, and dual new generation Intel® Xeon® processor E5-2600 v4 / v3 product families up to 22 cores and 145W TDP per socket. The StorNode™ supports redundant 2000W Titanium Level (96%+) Digital power supplies and dual large-diameter dual 17cm rear cooling fans for highest efficiency.

The Metastor StorNode™ represents a revolution in Green Computing designed to support customers' critical applications and also reduce Data Center TCO to help preserve the environment. The StorNode™ extends the compute and storage capabilities of Metastor's existing DUO MetaSERV® systems to achieve increased performance and power efficiency. Due to its shared components the StorNode™ improves cost-effectiveness and reliability, while its modular architecture makes it flexible to configure and easy to maintain.

The E5 v4 based StorNode™ system demonstrated a 26% improvement in performance over the previous generation E5 v3 based system. Performance-per-watt improvement with the E5 v4 based system was 25%. These data are shown in Table 3.



Figure 3: Metastor StorNode™ (SYS-F618R3-FTL)

CPU Generation	MCU-8HAX8U-FTL CPU		% Improvement
	E5-2650 v4	E5-2650 v3	
Performance (GFLOPS)	832.5	659.9	26%
Power (Watts)	313.5	309.9	
Performance per Watt	2.66	2.13	25%

Table 3: StorNode™ Benchmark Results

Results

Performance

Improvements in Performance for three new generation E5 v4 based 1U/2U/4U Metastor MetaSERV® systems were measured over previous generation E5 v3 based

systems using the HPL benchmark test. The Performance results for the three systems tested were nearly identical as shown in Chart 1, and the Performance increases between new generation systems and previous generation systems were also similar at 26% to 27%.

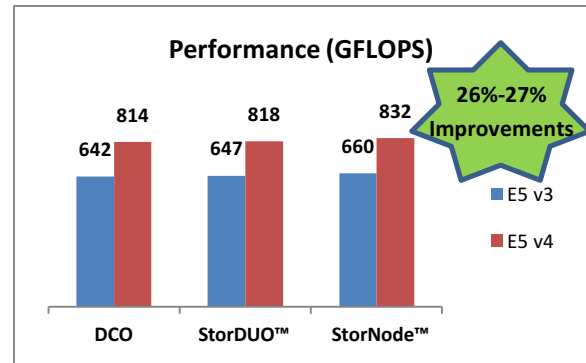


Chart 1: Performance Improvements for 3 Systems

Performance-per-Watt

The improvements in Performance-per-Watt between the new generation E5 v4 based systems and previous generation E5 v3 based systems were nearly identical for all the models tested, varying between 25% and 29%.

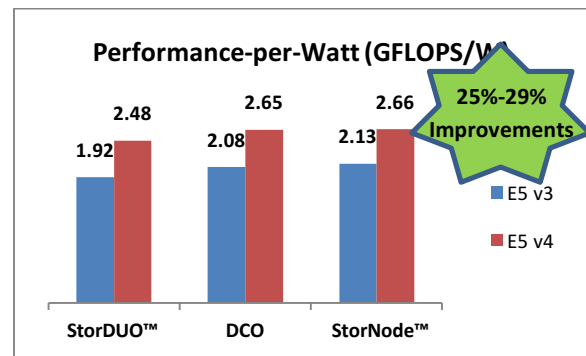


Chart 2: Performance/Watt of 3 MetaSERV® systems

Conclusions

Improvements in Performance and Performance-per-Watt were measured between Metastor new generation (E5 v4 "Broadwell") and previous generation (E5 v3 "Haswell") based StorNODEs, in three different form factors (1U/2U/4U). Performance and Performance-per-Watt increases were found to be nearly identical, varying in a small range between 25% and 29%. Since the two processor generations (E5 v4 and E5 v3) are comparably priced, these reported improvements offer compelling economic incentives for customers to select Metastor servers for new deployments or to refresh their current legacy server infrastructures.

* Test environments and configurations were identical; memory speed used with the E5 v4 CPUs was 2400MHz and for the E5 v3 CPUs was 2133MHz. Results are based on internal testing. Performance tests were measured using specific server systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. For more information please contact your Metastor sales representative or visit: www.Metastor.com