PRODUCT BRIEF

IMPROVE YOUR VIRTUALIZATION SOLUTIONS AND REDUCE COSTS WITH SUPERMICRO X14 SERVERS POWERED BY INTEL® XEON® 6 PROCESSORS

Significant Virtualization Efficiency Improvements Over 3rd Gen Intel Xeon Scalable Processor-Based Systems: 27% Less TDP Draw, 33% Lower Core Count, 50% Fewer Servers

SYS-122H-TN

SYS-222H-TN

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Executive Summary

Aging infrastructure is struggling with rising licensing fees, escalating energy costs, and the demands of expanding AI, virtualization, and enterprise workloads. The Supermicro X14 Hyper servers—featuring Intel Xeon 6 processors—provide a clear modernization path that boosts virtualization density, supports AI-ready capabilities, and drives major cost reductions through higher efficiency and fewer physical servers.

Methodology

To evaluate consolidation potential, VMmark 4.0.1 was run on clusters powered by different generations of Intel Xeon processors. VMmark, an industry-recognized benchmark designed to measure performance in virtualized environments under realistic mixed-workload conditions, models enterprise infrastructure by combining commonly virtualized application workloads—such as database services, web applications, and containerized microservices—into standardized workload bundles known as tiles. VMmark tile count and overall performance scores illustrate how effective systems can scale to meet growing enterprise demands.

Latest Solution: Supermicro X14 Hyper with Intel Xeon 6 processors

- 4x 1U Supermicro SYS-122H-TN servers, each with 2x Intel Xeon 6737P processors, 512 GB of RAM, M.2 boot, four storage drives, baseboard management controllers (BMC), and dual 100Gb networking (VMware vSAN nodes)[1]
- 1x 2U Supermicro SYS-222H-TN controller server with 2x Intel Xeon 6760P processors and 1TB RAM

Legacy Solution: Servers with 3rd Gen Intel Xeon Scalable processors

- 4x 2U previous-generation servers, each with 2× Intel Xeon 6336Y processors, 512 GB of RAM and dual 100Gb networking (vSAN nodes)
- Reflects a typical five-year hardware refresh cycle, the processor generation that most customers in the market are running today

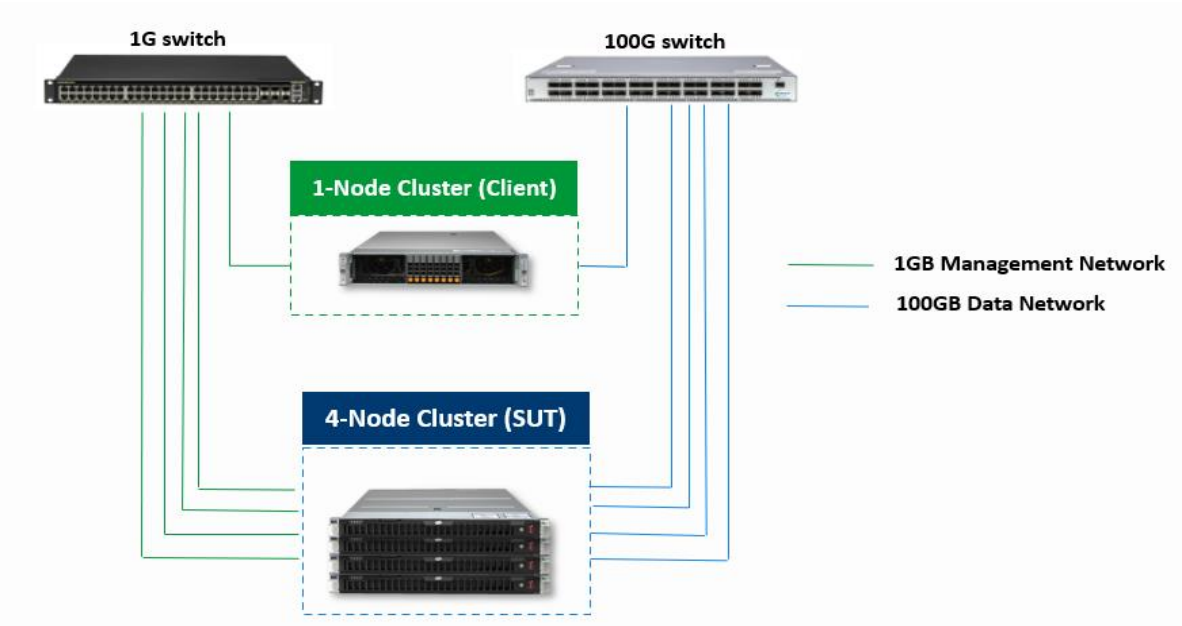

Figure 1 - Testbed diagram for the latest-gen Supermicro server cluster powered by Intel Xeon 6 processors.

Results and Analysis

The X14 Hyper cluster supported more than twice as many VMmark tiles. It achieved 2.39× the overall VMmark score compared to the legacy cluster, demonstrating clear generational gains in scalability and concurrent workload performance.

Four-node Performance Metric	Legacy (3rd Gen Intel Xeon Scalable)	X14 Hyper (Intel Xeon 6)
VMmark 4.0.1 Score[2]	1.07	**2.56 (+2.39×)**
VMmark 4.0.1 Tiles Supported[2]	1.2	**2.6 (+2.16×)**

Table 1 - Performance comparison of four-node clusters.

Consolidation Metric	Legacy (3rd Gen Intel Xeon Scalable)	X14 Hyper (Intel Xeon 6)
Total CPUs (four-node cluster)	16	8 (−50%)
Total CPU Cores	384	256 (−33%)
Aggregate CPU TDP (watts)	2,960	2,160 (−27%)

Table 2: Consolidation comparison of 2 four-node legacy clusters to 1 four-node X14 Hyper cluster.

Supporting more tiles indicates the ability to scale virtualized environments without adding physical infrastructure. Higher VMmark scores reflect the capacity to run more concurrent applications while maintaining acceptable latency and service levels.

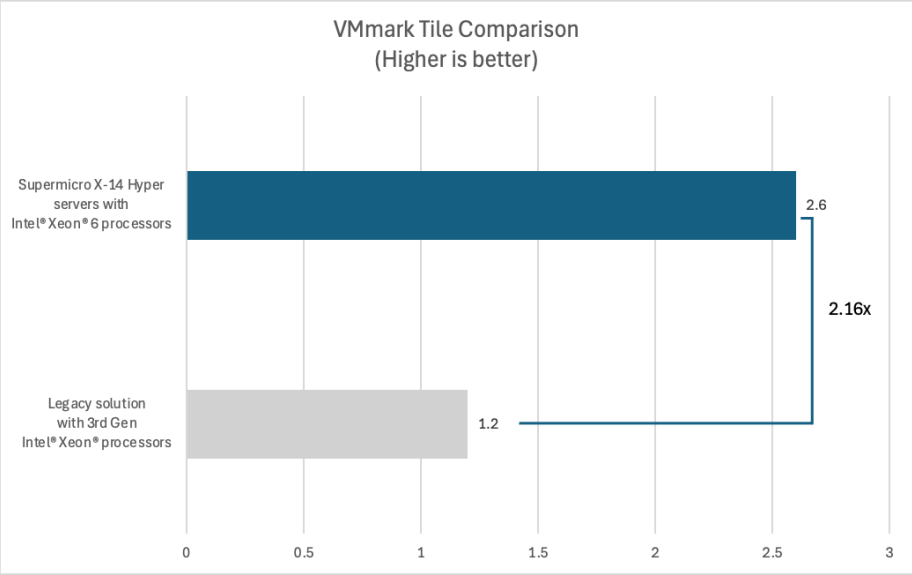

Figure 4 - The Supermicro cluster, powered by Intel Xeon 6 processors, supported more than 2x the VMmark tiles vs. the legacy cluster using 3rd Gen Intel Xeon Scalable processors.

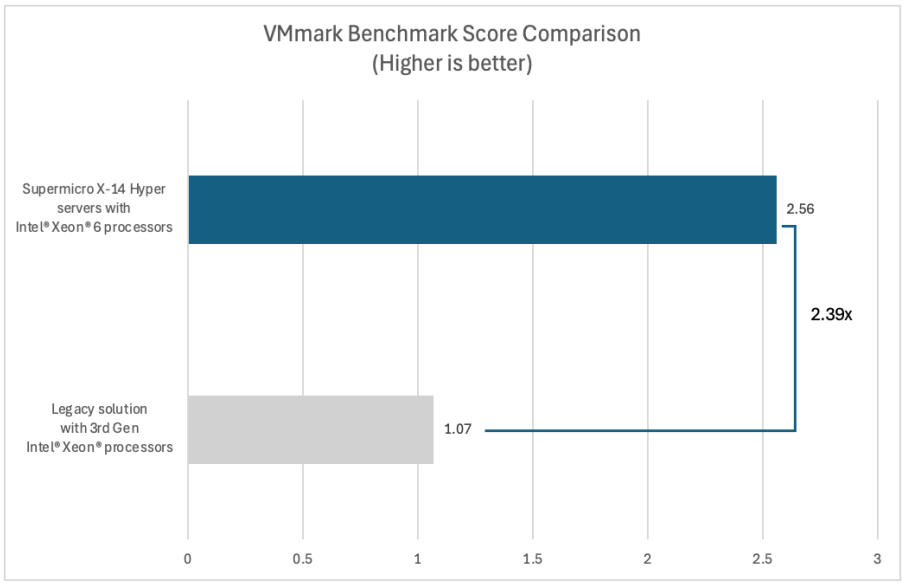

Figure 5 - The Supermicro cluster powered by Intel Xeon 6 processors delivered over 2x the VMmark performance score vs. the legacy cluster using 3rd Gen Intel Xeon Scalable processors.

Reduce Costs: CPU TDP and Per-Core Licensing

27% Lower Aggregate CPU TDP Through Socket Consolidation

Data center power and cooling remain persistent operational concerns. By consolidating 16 legacy CPUs (Intel Xeon 6336Y, 185W TDP each → 2,960W total) into an 8 CPU X14 Hyper cluster (Intel Xeon 6737P, 270W TDP each → 2,160W total), organizations can achieve a 27% reduction in aggregate CPU TDP, delivering more performance while drawing less total processor power.

33% Fewer Cores to License

Many enterprise platforms—including VMware, Oracle, and SQL Server have licensing pricing based on the number of physical cores. The X14 Hyper upgrade reduces the total number of cores by 33%, from 384 (16 × 24-core 6336Y) to 256 (8 × 32-core 6737P). Fewer cores mean lower licensing requirements and increased workload density within existing investments. In many environments, these licensing savings alone can offset the cost of new hardware in a short payback window.

Why Customers Choose the X14 Hyper Platform

The Supermicro SYS-122H-TN server and the Supermicro SYS-222H-TN server are purpose-built for virtualization, software-defined storage, cloud computing, and enterprise workloads—with a design that makes it easy for IT teams to run more with less.

- *More applications per server:* Dual Intel Xeon 6 processors and up to 8TB of memory let customers run significantly more VMs per box than their current servers might handle

- *62.5% faster memory:* DDR5 at 5200 MT/s vs. DDR4 at 3200 MT/s means applications respond faster, and AI workloads can run without bottlenecks; the memory upgrade also futureproofs customers as DDR4 reaches end-of-life in 2026
- *Lower energy bills:* Titanium-rated (96% efficient) power supplies waste less electricity than standard supplies; when combined with running fewer servers, customers see a meaningful drop in their power and cooling costs
- *Double the memory at no extra hardware cost:* VMware Memory Tiering combines installed RAM with fast NVMe storage to create a larger memory pool (e.g., a server with 1TB of RAM can act like it has 2TB), reducing the need to buy additional memory
- *Eliminate expensive external storage:* VMware vSAN ESA uses the drives already inside the server as shared storage, removing the need for dedicated SAN hardware and associated costs
- *Ready for AI and GPU workloads today:* Expansion slots support GPUs and AI accelerators without any performance tradeoffs, so customers can add AI capabilities as their needs grow without replacing the server
- *Plug-and-play with VMware:* Both the SYS-122H-TN and SYS-222H-TN are on the VMware Hardware Compatibility List (HCL), meaning customers get a validated, supported configuration with no compatibility surprises
- *Built-in AI acceleration at no extra cost:* Intel® Advanced Matrix Extensions (AMX) is built directly into Xeon 6 processors, boosting AI training and inference performance without requiring a separate GPU or accelerator card; customers get AI-ready infrastructure as part of the standard server
- *Hardware-level data protection for regulated industries:* Intel® Trust Domain Extensions (TDX) creates hardware-isolated VMs that protect sensitive data even from the underlying hypervisor; a strong conversation-starter for customers in finance, healthcare, defense, and cloud who need to demonstrate data security in virtualized environments

Interpreting the Results

The VMmark results indicate practical implications for real-world virtualization deployments. Higher tile density and improved overall scores can enable organizations to support more workloads per X14 Hyper cluster while maintaining or exceeding required performance levels. These outcomes can be particularly useful for:

- Virtualization upgrades and consolidation initiatives, where fewer servers support equivalent or greater workload capacity
- Mixed-workload environments, including databases, web services, analytics platforms, and containerized applications that benefit from increased concurrency
- Software-defined infrastructure and hybrid cloud deployments, where higher memory bandwidth and faster I/O can sustain performance for storage-intensive or distributed workloads
- AI-adjacent infrastructure expansion, where additional performance headroom can support emerging workloads alongside existing virtualized applications

Key Takeaways

- There is higher consolidation potential with measurable performance gains, as VMmark testing showed that one latest-gen four-node X14 Hyper cluster did the work of two older-gen four-node clusters with overhead for more applications.
- Consolidating workloads onto fewer, higher-performing systems allows organizations to reduce both their server footprint and the number of CPU cores they must license.
- Performance-driven consolidation improves operational efficiency by reducing power consumption, cooling requirements, and management overhead compared to maintaining larger fleets of legacy systems.

- Advances in memory bandwidth, high-speed I/O, and flexible system architecture ensure the platform is ready to support evolving workloads, hybrid cloud environments, software-defined infrastructure, and emerging AI use cases.

For More Information

Supermicro Hyper Servers: https://www.supermicro.com/en/products/hyper
Intel Xeon 6 Processors: https://www.intel.com/content/www/us/en/products/details/processors/xeon.html

Footnotes

1. Software: All VMs: Ubuntu 22.04, VMmark 4.0.1
   Configurations: 4 x Inspur Servers M50CYP2SBSTD with 2x Intel(R) Xeon(R) Gold 6336Y, VMware ESXi, 9.0.0.0.2475529, 512 GB memory, 185 TDP (W), HT/SMT: On, TurboBoost: On, Motherboard: M50CYP2SBSTD, BIOS: SE5C620.86B.01.01.0010.250109185, Network: Intel Ethernet Controller E810-C for QSFP, Storage: 2 x Intel SSDPE2KE032T8 3.2TB NVMe SSD, VM details – 1-36 vCPUs, 1 socket per VM, 1 NUMA node (set to Assigned on power on), 0.5-48GB memory; 4x Supermicro SYS-122H-TN with 2x Intel(R) Xeon(R) 6737P, VMware ESXi, 9.0.0.0.2475529, 512GB memory, 270 TDP (W), HT/SMT: On, TurboBoost: On, Motherboard: X14DBM-SP, BIOS: 1.4, Network: Nvidia ConnectX-5 Ex EN 2x 100G QSFP28, Storage: 4 x KIOXIA KCMYXRUG1T92 1.92TB NVMe SSD; VM details – 1-36 vCPUs, 1 socket per VM, 1 NUMA node (set to Assigned on power on), 0.5-48GB memory.
2. Performance results are based on testing by Principled Technologies as of 02/02/2026 and may not reflect all publicly available updates. Results may vary. Results have not been reviewed by VMware VMmark review panel.

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