WHITE PAPER

Supermicro H15 Servers Incorporate the Latest CPUs from AMD, Resulting in Maximum Performance and Opportunities for Consolidation

Industry-Leading Performance and Increased Core Counts with the AMD EPYC™ 9006 SP7 Server CPUs

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EXECUTIVE SUMMARY

The exponential growth of artificial intelligence, high-performance computing (HPC), and enterprise cloud workloads demand unprecedented levels of compute density and energy efficiency. Integrating AMD's next-generation EPYC 9006 SP7 Server CPU architecture with Supermicro's application-optimized server designs directly addresses these infrastructure bottlenecks. Featuring the advanced Zen 6 core architecture, expanded memory bandwidth, and PCIe Gen 6 readiness, AMD EPYC 9006 SP7 Server CPUs enable enterprise data centers to accelerate parallel processing workloads dramatically. By adopting Supermicro's flexible building-block architecture alongside these CPUs, organizations can maximize per-rack compute density, minimize thermal output through advanced liquid-cooling configurations, and significantly lower total cost of ownership (TCO). This powerful combination provides the scalable, future-proof infrastructure required to sustain competitive advantages in an increasingly data-driven market.

SUPERMICRO DATA CENTER BUILDING BLOCK SOLUTIONS® (DCBBS)

Supermicro is a leader in providing state-of-the-are solutions for data center IT infrastructures. The advantages of working with Supermicro include:

- **First to Market w/ New Products** – Supermicro is known to deliver the latest servers to the market more quickly than other server vendors.
- **Time to Online with Full Data Center Delivery Capabilities** – The quicker that a rack of servers can be delivered to a customer, the faster that the customer can bring the systems online and deliver on SLAs.
- **Broadest Portfolio for Exactly the Best Solution for Every Market** – With a wide range of systems offered, from the edge to the data center, customers, together with Supermicro experts, can create an environment for any workload.
- **US Manufacturing** *(In-House, Vertically Integrated)* – While many server vendors use a series of other organizations to design, manufacture, and then build data center solutions, Supermicro, with worldwide manufacturing operations, can deliver the entire hardware and software stack directly in its own manufacturing facilities, with significant investment in facilities in the US.

Supermicro offers a broad range of server and storage solutions, including AMD EPYC CPUs. These servers are available in both single-socket and dual-socket configurations (detailed below).

SUMMARY OF AMD EPYC™ 9006 SERIES CPUS

With the latest AMD processors featuring Zen6 cores, Supermicro and AMD are enhancing their leadership by offering higher throughput, increased VM density, improved power efficiency, and expanded memory bandwidth. The AMD EPYC 9006 SP7 Server CPUs deliver higher socket throughput and better performance per watt than previous AMD EPYC models. VM density is boosted by 33%, raising the core count from 192 to 256 at the top of the stack. Additionally, there is a notable performance boost with advancements in I/O technology, from PCIe Gen 5 to PCIe Gen 6 and CXL 3.1.

On the memory bandwidth side, the channel count increases from 12 to 16 increasing memory bandwidth by 1.78× with DDR5-8000 and ~2.6× with MRDIMM (12.8 GT/s), reaching ~1.6 TB/s per socket.

In addition to supporting high-end markets, the AMD EPYC 9006 SP7 Server CPUs will expand the enterprise platform portfolio by providing platform optimizations for mainstream use cases and price points. Servers powered by the new AMD EPYC 9006 SP7 Server CPUs are designed for demanding workloads, including HPC, AI, and Cloud environments.

Supermicro Summary of Systems with AMD EPYC™ 9006 SP7 Server CPUs

Product Family	Height (U)	# of Processors Per Node	Cores Per CPU
CloudDC	1 or 2	1	64, 96, 128, 168,192,256
Hyper	1 or 2	1 or 2	
FlexTwin	1 (OU)	2	
GrandTwin	2	1	
Petascale	2	1	
SuperBlade	8	1 or 2	

SUPERMICRO PLATFORMS INCORPORATING THE AMD EPYC™ 9006 SP7 SERVER CPUS: RACKMOUNTS

Hyper

The Hyper servers are designed for maximum rackmount flexibility with front I/O for today's data center requirements as a dual-socket server. These systems can handle the maximum CPU wattage and the maximum number of DIMMs to accelerate a wide range of workloads. In addition, the Hyper systems feature many PCIe slots (including combinations of PCIe 6.0 x16 and x8 slots) for extreme flexibility, are toolless for fast, easy servicing, and support various storage devices (NVMe/SAS/SATA). The Hyper systems can also support 1 AIOM/OCP 3.0 NIC.

Common workloads for the Hyper family include:

- Enterprise Server
- Cloud Computing
- Big Data Analytics
- Hyperconverged Storage
- AI Inference and Machine Learning
- Network Function Virtualization

Hyper systems will benefit from the increased core count at pricing similar to that of 5th Gen AMD EPYC processors. In addition, the faster PCIe 6 communication bus will provide faster access to storage devices.

CloudDC Family

The CloudDC family is explicitly designed for cloud data centers where space is premium. The CloudDC product line is toolless, meaning servicing these servers (hot-swapping) is quick and easy. The I/O options vary; the systems can accommodate up to three FHHL GPUs, depending on the model. The CloudDC family can support a single AIOM/OCP 3.0 card, providing tremendous expandability and flexibility. The CloudDC family also supports up to 5 PCIe 6.0 slots. 16 NVMe storage devices are supported for maximum I/O performance and capacity, depending on the exact model. The Supermicro H15 CloudDC system is designed to comply with the DC-MHS standard.

Common workloads for the CloudDC family include:

- Cloud Computing
- Web Servers
- Hyper-converged Storage
- Virtualization
- File Servers
- Head-node Computing
- 5G Telco
- AI Inferencing

SUPERMICRO PLATFORMS INCORPORATING THE AMD EPYC™ 9006 SP7 SERVER CPUS: MULTINODE SYSTEMS

GrandTwin®

The Supermicro GrandTwin is an innovative multi-node platform that integrates multiple independent servers into a shared 2U enclosure. By sharing key system resources—including the chassis, high-efficiency cooling, backplane, and intelligent power infrastructure—it helps reduce operating costs while maximizing compute density.

The platform is available in 2U2N configurations, providing deployment flexibility for a wide range of workloads. Both configurations feature comprehensive rear I/O for improved cable management and peripheral connectivity in dense data center environments. The 2U2N configuration further expands system capabilities with full PCIe GPU support, making it ideal for accelerated workloads such as AI inference, graphics processing, and high-performance computing.

To support diverse storage requirements, the platform offers flexible storage configurations with support for U.2, E1.S, and E3.S NVMe drives, allowing customers to optimize the system for capacity, performance, or storage density based on their application needs.

Supermicro's front-serviceable, hot-swap node design simplifies deployment and maintenance in space-constrained environments by enabling all service operations from the front of the rack. Powered by AMD EPYC processors, the GrandTwin architecture delivers outstanding performance in a modular platform that can be optimized for a broad range of enterprise, cloud, and HPC applications.

Built on Supermicro's Resource-Saving Architecture, the GrandTwin platform improves power efficiency and reduces material costs through shared system components, including power supplies and cooling infrastructure.

Common workloads include:

- Diskless HPC
- All-Flash HCI
- Hybrid Cloud
- All-Flash NVMe Storage
- High-Performance File Systems
- Software-Defined Storage

FlexTwin™

The Supermicro H15 FlexTwin ORV3-compliant liquid-cooling solution is a new platform designed to maximize performance density and serviceability in a multi-node architecture. Featuring a dual-socket design, it supports the latest CPU, memory, storage, and liquid-cooling technologies to deliver outstanding compute performance. Purpose-built for demanding HPC workloads, it is ideal for applications in financial services, manufacturing, scientific research, and complex modeling.

This rack-scale 1OU 2-node platform delivers higher compute density per rack while improving infrastructure efficiency through an integrated power busbar and unified power shelves. These features reduce power distribution losses and cooling overhead, helping lower overall operating costs.

The front-serviceable design simplifies maintenance in production environments. Front I/O, storage devices, and add-on cards can all be accessed from the cold aisle, minimizing service time and reducing operational disruption.

The system supports up to three PCIe expansion slots, one OCP 3.0 NIC, and dual-socket processors, providing the flexibility and high-bandwidth connectivity required for modern AI and HPC deployments.

Common workloads include: HPC Data Center • Financial Services •Manufacturing Climate & Weather Modeling • Oil & Gas • Scientific Research

SuperBlade®

Powered by AMD EPYC SP7 Server CPUs, the H15 8U 10-Node SuperBlade represents next-generation, rack-scale breakthrough architecture for HPC, AI inference, agentic AI, and enterprise-class compute workloads with CPU and GPU. The platform supports both single-socket and dual-socket blade configurations - with both air- and liquid-cooled versions optimized for maximum density, high performance, and efficiency, across a wide range of infrastructure deployments. The SuperBlade can handle the maximum CPU wattage and the maximum number of DIMMs for the most demanding workloads in Enterprise, HPC, and AI.

Common Workloads include:

- HPC
- AI
- Financial Services
- Manufacturing
- Climate & Weather Modeling
- Energy
- Scientific Research
- Agentic AI

SUPERMICRO PLATFORMS INCORPORATING THE AMD EPYC™ 9006 SP7 SERVER CPUS: STORAGE SYSTEMS

Petascale

If you have growth challenges, like limited rack space, storage bottlenecks, and are hitting power and thermal walls when scaling AI workloads, look no further. The The H15 Supermicro Petascale server, was built to address these issues by combining high-density all-flash storage with strong compute performance in one efficient platform.

The H15 SP7 PetaScale platform, built on AMD's EPYC 9006 SP7 Server CPU, supports up to 256 Zen 6 cores with a 600W TDP, 1.3× thread density, and up to 1.6 TB/s of memory bandwidth. Leveraging PCIe® Gen 6, the platform provides up to 2.0× bandwidth and achieves an expected 1.8× generational performance improvement for AI and HPC workloads.

Petascale architecture leverages balanced resource allocation and reduces latency by minimizing data path lengths and maximizing airflow over critical components, ensuring optimal thermal performance.

With the latest high-density, industry-standard EDSFF E3.S and E3.L form factors explicitly designed for high-performance solid-state media, Petascale servers can can pack greater than 1.5 PB per rack and deliver maximum performance over PCIe 6.0 interconnects.

Supermicro's Petascale storage systems are ideal for deployments where storage throughput and latency are paramount, including generative AI, mission-critical databases, virtualization, next-gen big data, HPC, media & entertainment, and hot-tier caching.

Key Applications:

- Data-Intensive HPC and AI
- Private & Hybrid Cloud
- Software-Defined Storage
- NVMe Over Fabrics Solution
- In-Memory Computing
- Composable Infrastructure Platform

AMD EPYC™ 9006 SP7 SERVER CPU DETAILS

CORE COUNT INCREASE OVER GENERATIONS

The 6th Gen AMD EPYC Server Processors have more cores than previous generations of AMD EPYC processors. More cores enable faster processing for applications that have been designed to take advantage of multiple cores, or more applications can be run on the same CPU simultaneously.

	3rd Gen AMD EPYC cores	4th Gen AMD EPYC cores	5th Gen AMD EPYC cores	6th Gen AMD EPYC cores	% Increase (3rd Gen to SP7) max
Number of Cores	Up to 64	Up to 128	Up to 128 (Zen 5) and 192 (Zen 5c)	Up to 256	4X

MEMORY ACCESS PERFORMANCE

The speed at which the CPU can access memory greatly affects the overall execution time of a task. The AMD EPYC 9006 SP7processors improve memory access with data rates up to 8000 MT/s (DDR5) or 12.8 GT/s with MRDIMM, across 16 channels. Total memory bandwidth is calculated as: channels × data rate × 8 bytes per transfer (each DDR channel is 64 bits = 8 bytes).

	3rd Gen AMD EPYC 7003 processors	5th Gen AMD EPYC 9005 processors	AMD EPYC 9006 SP7 (DDR5-8000)	AMD EPYC 9006 SP7 (MRDIMM-12.8G)	% Increase (3rd Gen to SP7 MRDIMM)
Memory Performance (Per Channel)	3200 MT/s	6000 MT/s	8000 MT/s	12,800 MT/s	+300%
Number of Channels	8	12	16	16	+100%
Bytes per Transfer	8	8	8	8	-
Total Memory Bandwidth (channels rate x 8 Bytes)	8 x 3200 x 8 = 204.8 GB/s	12 x 6000 x 8 = 576 GB/s	16 x 8000 x 8 = 1024 GB/s (~1.0TB/s)	16 x 12,800 x 8 = 1638 GB/s (~1.6TB/s)	+700%

The AMD EPYC SP7 Server CPUs offer 4X as many cores as the 3rd Gen AMD EPYC processors.

1. Broad Selection	2. Compute Power	3. Max Core Counts	4. Thermal Design
Wide range of workload optimized server families to meet customer use cases.	Powerful per core performance with high core counts	High density multi-node systems with up to 8 CPUs ,offering up to 36,000+ cores per rack	Optimized thermal design including liquid cooling for space and overall TCP savings

The Supermicro H15 products have been designed with the following components:

1. Broad Selection — The Supermicro H15 product line offers a wide range of choices optimized for specific workloads.

2. Compute Power — The Supermicro H15 products with the AMD EPYC 9006 SP7 Server CPU series offer top-level performance for many metrics and, when combined with high core counts, are ideal for a range of workloads.

3. Max Core Counts — Supermicro H15 servers have been designed to house AMD's most powerful and energy-intensive CPUs for high-end computing environments.

4. Thermal Design — By optimizing the airflow within a system, high-performing CPUs can be used without concern for overheating. Liquid cooling increases the compute density and lowers the data center PUE

Maximum Performance, Efficiency, and Density

Supermicro H15 servers with AMD EPYC 9006 SP7 Server CPUs deliver maximum performance (256 Zen 6 cores and 512 threads) for dense, high-core-count, and high-frequency applications. This results in better efficiency and higher-density compute.

Broadest Portfolio and Flexible Options with Liquid Cooling at Rack-Scale

Supermicro's Building Block architectures enable custom configuration of expansion, acceleration, networking, and storage, supporting AMD's EPYC 9006 series processors and delivering the broadest portfolio of Enterprise, Cloud, and AI solutions powered by AMD EPYC CPUs.

SUPERMICRO PORTFOLIO LIST OF SYSTEMS WITH THE AMD EPYC™ 9006 SERIES SERVER CPUS

Up to 256 Cores per CPU, 1.3x Thread Density (vs 9965), 2nm, Zen6, 1.6TB/s Mem BW, PCIe Gen6

Hyper
- AS -1127H7-N *(1U, 2P, 1DPC, 32 DIMMs)*
- AS -2127H7-N *(2U, 2P, 1DPC, 32 DIMMs)*

CloudDC
- AS -1117C7-N *(1U, 1P, 1DPC, 16 DIMMs)*
- AS -2117C7-N *(2U, 1P, 1DPC, 16 DIMMs)*

SuperBlade
- SBA-827V7-1N *(8U, 2P, 1DPC, 32 DIMMs)*
- SBA-817V7-1N *(8U, 1P, 1DPC, 16 DIMMs)*

GrandTwin
- AS -2117GT7-DNF *(2U2N, 1P, 1DPC, 16 DIMM)*

FlexTwin
- AS -1127FT7-DEO-ALC *(1OU2N) (2P, 1DPC, 32 DIMM)*

Petascale
- ASG-2117S7-NE340R *(2U, 1P, 1DPC, 16 DIMM)*

Supermicro continues to design the most performant servers available today in several configurations to suit the many needs of a modern data center. The Supermicro H15 product line has been updated to include the latest AMD EPYC SP7 Server CPUs.

For More Information: www.supermicro.com/aplus

SUPER MICRO COMPUTER, INC.

As a global leader in high-performance, high-efficiency server technology and innovation, we develop and provide end-to-end green computing solutions to the data center, cloud computing, enterprise IT, big data, HPC, and embedded markets. Our Building Block Solutions® approach allows us to provide a broad range of SKUs and enables us to build and deliver application-optimized solutions based on your requirements.

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AMD

AMD is the high performance and adaptive computing leader, powering the products and services that help solve the world's most important challenges. Our technologies advance the future of the data center, embedded, gaming and PC markets.

Founded in 1969 as a Silicon Valley start-up, the AMD journey began with dozens of employees who were passionate about creating leading-edge semiconductor products. AMD has grown into a global company setting the standard for modern computing, with many important industry firsts and major technological achievements along the way.

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