



All-Flash NVMe Systems & Storage Family

Transformative Performance, Density & Efficiency



Transform Your Data Center TCO
with Supermicro servers based on
the 2nd generation Intel® Xeon® Scalable processors



Industry Leading NVMe Servers & Storage

Over the last decade flash based SSDs have transformed storage and have been increasingly adopted across a wide variety of application workloads and tiers of storage due to the significant improvements in performance, latency and power consumption over that of traditional mechanical HDDs. While initially comparatively expensive, the cost of flash has continued to drop which has also contributed to the mass adoption of SSDs.

Until recently SSDs have utilized SAS and SATA connectivity as their storage interface. While providing dramatic benefits over that

of HDDs, when connecting SSDs through legacy storage interfaces designed for HDDs the full potential of flash based SSDs can not be realized. Through HBAs, SATA provides 6GB/s throughput, while SAS provides 12GB/s, in essence limiting the throughput of SSDs.

NVMe is a newer interface specification designed as a host controller interface and storage protocol for the use of SSDs directly over a computer's PCIe bus. NVMe SSDs are connected to a CPU's PCIe bus without need for HBAs, eliminating component count, cost, and layers in the IO stack. As a result, NVMe

takes flash based SSDs to the next level by providing up to 6 times more throughput, with up to 7 times reduction in latency, lower power consumption and higher reliability. Until recently there was a price premium for NVMe drives over that of SAS/SATA SSDs. As of early 2019 the pricing has equalized, enabling all the benefits of NVMe without forcing a cost per Gigabyte tradeoff. Supermicro offers NVMe systems across the broadest range of SuperServer and SuperStorage systems in the industry, ready to transform your data center infrastructure today.



TRANSFORMATIVE PERFORMANCE, DENSITY AND EFFICIENCY

Other benefits of NVMe include the broad choice in drive form factors as well as support for both single and dual port access. The Supermicro product portfolio supports them all.

- U.2 is recognizable by its traditional 2.5" enclosure, designed to support NVMe as well as SAS and SATA with the same connector family. Addressing the enterprise market, hot-plugability was a key design principle. U.2 has been the predominant form factor for flash based SSDs and Supermicro's portfolio of NVMe systems includes many systems which support this form factor.
- M.2 was originally designed for internally mounted computer cards and supports a wide variety of interfaces, including NVMe. Based on its design for internal usage, M.2 is not a hot pluggable storage device. Many Supermicro systems support NVMe M.2 drives for boot or cache drives as part of a system with multiple tiers of storage.
- NF1 has been known as Next Generation Small Form Factor, developed by Samsung to provide a high capacity, hot-pluggable follow-on to M.2 for the enterprise. NF1 allows for a shorter depth chassis together with high capacity drives. Supermicro offers a 1U Petabyte scale system with NF1 drives.
- EDSFF (Enterprise & Data Center SSD Form Factor) is a new industry standard form factor focused on high density, thermal efficiency and hot-plug capability. EDSFF supports NVMe through PCIe Gen 3/4/5 up to 16 lanes. Within EDSFF there are two primary form factors, Long (E1.L) and Short (E1.S). With EDSFF, Supermicro offers 1U systems with 32 front accessible drives in the Petabyte range of capacity, with NVMe throughput and latency, and the optimal cooling attributes only EDSFF can provide.

1U Petascale

CAPACITY OPTIMIZED SYSTEMS WITH FLAGSHIP DENSITY



1U dual-socket storage systems and JBOF

Up to 36 drive bays; U.2, NF1, E1.L, E1.S support

2nd Gen Intel® Xeon® Scalable processors

24 DIMM slots; Intel® Optane™ DCPMM support

Onboard 10 Gigabit Ethernet

[Learn more on page 6](#)

Ultra

PERFORMANCE OPTIMIZED FOR SINGLE SYSTEM IO THROUGHPUT



1U/2U dual-socket server systems

Up to 20 NVMe (7mm z-height) in 1U / 24 NVMe in 2U

2nd Gen Intel® Xeon® Scalable processors

24 DIMM slots; Intel® Optane™ DCPMM support

Onboard networking options up to 25G Ethernet

[Learn more on page 10](#)

BigTwin™

FLAGSHIP PERFORMANCE FOR MOST DEMANDING HCI AND STORAGE APPLICATIONS



Two or four dual-socket nodes in 2U

Up to 40 drive bays; U.2, M.2, E1.S support

2nd Gen Intel® Xeon® Scalable processors

24 DIMM slots per node; Intel® Optane™ DCPMM support

Onboard flexible networking up to 100G

[Learn more on page 12](#)

Storage Bridge Bay

DUAL-PORT STORAGE FOR HIGH AVAILABILITY SOLUTIONS



Two hot-pluggable nodes in 2U

Up to 24 drive bays; dual-port U.2 support

2nd Gen Intel® Xeon® Scalable processors

Up to 12 DDR4 DIMM slots per node

Onboard 10 Gigabit Ethernet

[Learn more on page 14](#)

1U Petascale Systems

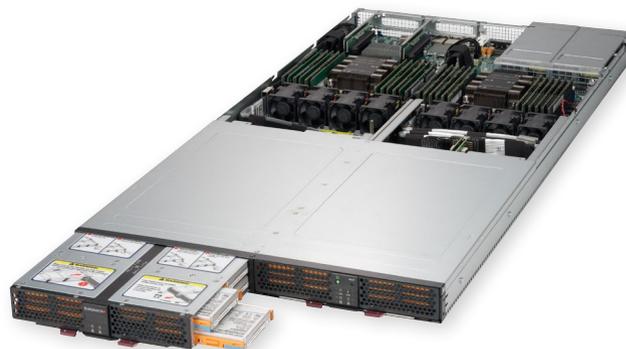
CAPACITY OPTIMIZED SYSTEMS WITH FLAGSHIP DENSITY

Supermicro 1U Petascale SuperStorage platforms provide industry leading density in a 1U footprint across a wide choice of NVMe form factors. By offering 32+ hot-pluggable drives Petabyte-scale capacity can be achieved and enable an unprecedented combination of storage performance, density, efficiency and enterprise serviceability. This combination optimizes IOPs per Watt which is ideal for transitioning capacity tiers of storage based on legacy HDDs to the benefits of all-flash NVMe SSDs.



32x E1.S Drive Bays

The latest Petascale systems offer choice in EDSFF Long and Short form factors with one system offering 32 E1.L drives with the largest capacity options and longer chassis depth. The second system offers 32 E1.S drives with a proportionally shorter chassis depth. The U.2 based system uniquely enables 32 industry-standard hot-pluggable NVMe drives made accessible through dual drive trays, while the NF1 provides 32 NF1 drives plus 4 additional SATA M.2 drives.



32x U.2 Drive Bays



32x E1.L Drive Bays



32x NF1 + 4x M.2 Drive Bays



1U Rackmount

Up to 32 hot-swap NVMe drive bays in 1U



2-Socket

Up to 2nd gen Intel® Xeon® Scalable processors; up to 205W TDP



24 DIMM Slots

Up to 6TB DDR4-2933 ECC memory per node; Intel® Optane™ DCPMM support available



NVMe

Supported SSD form factor: EDSFF E1.S and E1.L, 2.5" U.2, NF1, M.2



Input/Output

Dual 10GbE with dedicated IPMI LAN port; Additional PCI-E 3.0 slots for expansion



Titanium Level

Up to redundant 1600W high-efficiency digital power supplies

1U Petascale JBOF

CAPACITY OPTIMIZED JBOF WITH FLAGSHIP DENSITY

The Supermicro Petascale family also takes the Just-a-Bunch-Of-Disk (JBOD) architecture and brings it into the modern world of high performance NVMe storage with Just-a-Bunch-Of-Flash (JBOF). Ideal for 1U storage expansion, the Petascale JBOF systems provide the same density and capacity as their Petascale system counterpart and are intended to be an extension of storage hosted from as many as 8 systems. For scenarios where capacity and efficiency are the primary goals, Supermicro Petascale JBOF systems provide maximum 1U capacity together with the thermal efficiency of SDDs.

The latest Petascale JBOF system offers 32 E1.L drives in 1U and represents the ultimate in Resource-Savings with thermal efficiency built in to the EDSFF design. The U.2 based system also enables 32 industry-standard hot-pluggable NVMe drives, also using dual drive trays while providing SDD-based efficiency over that of HDD JBOD systems.



32x E1.L Drive Bays



32x U.2 Drive Bays



32x E1.L Drive Bays



1U Rackmount

Up to 32 hot-swap NVMe drive bays in 1U



NVMe

Supported SSD form factor:
EDSFF E1.L and 2.5" U.2



POWER SUPPLY

Titanium Level

Up to redundant 1000W high-efficiency digital power supplies



Flexible Networking

2 RJ45 Dedicated IPMI LAN ports;
4 PCI-E x16 IO ports, 2 PCI-E x16 slots

Ultra

PERFORMANCE OPTIMIZED FOR SINGLE SYSTEM I/O THROUGHPUT

While Supermicro Ultra systems represent the flagship dual processor SuperServer, NVMe based configurations enable extremely high performance storage systems optimizing IOPS per Gigabyte. Supermicro Ultra SuperServers are designed to deliver the highest performance, flexibility, scalability and serviceability in a 1U or 2U dual processor server. By providing the highest TDP available with the latest 2nd generation Intel® Xeon® processors together with maximum, balanced bandwidth to NVMe drives, the CPU to drive ratio is

optimized and provides the highest IOPS per system.

NVMe based Ultra SuperServers include both 1U and 2U form factors with a range of choice in available U.2 drive bays. 1U models include 10 2.5" NVMe drives, 12 2.5" NVMe drives, and 20 2.5" 7mm NVMe drives. Rounding out the family, the 2U models include 20 2.5" drives as well as the largest in the family providing 24 2.5" drives.



1U Ultra 12x 2.5" Drive Bays



2U Ultra 24x 2.5" Drive Bays



10x 2.5" Drive Bays



12x 2.5" Drive Bays



20x 2.5" (7mm z-height) Drive Bays



FORM-FACTOR

1U/2U Rackmount

Up to 12x 2.5" or 4x 3.5" drive bays in 1U;
Up to 24x 2.5" or 12x 3.5" drive bays in 2U



CPU

2-Socket

Up to 2nd gen Intel® Xeon® Scalable processors; up to 205W TDP



MEMORY

24 DIMM Slots

Up to 6TB ECC memory with 256GB DIMMs, up to DDR4-2933MHz; Intel® Optane™ DCPMM support available



STORAGE

NVMe/SAS3/SATA3

Supported SSD form factor: 2.5" U.2;
Optional SAS3 support via AOC;
Optional M.2 support via Riser/AOC



I/O

Input/Output

Flexible networking via Ultra Riser adapters* with dedicated IPMI LAN port



POWER SUPPLY

Titanium Level

Up to redundant 1600W high-efficiency digital power supplies

BigTwin™

FLAGSHIP PERFORMANCE FOR MOST DEMANDING HCI AND STORAGE APPLICATIONS

The Supermicro BigTwin represents an innovative, no-compromise multi-node system with up to 4 nodes in a 2U form factor which is ideal for HCI architectures. BigTwin provides the ultimate in multi-node performance with the highest TDP processors and balanced bandwidth to NVMe drives. NVMe based configurations optimize the highest IOPS per node in a multi-node system, providing maximum IOPS per Gigabyte. With shared power and cooling across a multi-node system, BigTwin also provides Resource-Saving efficiencies without compromising on performance or density.

The latest BigTwin offers 10 E1.S EDSFF drives per node, together with 2 additional front-accessible SATA M.2 drives per node providing a maximum of 40 E1.S drives and 8 SATA M.2 drives.

BigTwin also offers U.2 based models. The 2U, 4 node BigTwin with 6 2.5" NVMe drives per node maximizes IO throughput per node and multi-node density. The 2U, 2 node BigTwin with 12 2.5" NVMe drives per node maximizes drives per node in the same footprint.



4-Node: 10x E1.S and 2x M.2 (SATA3) per node



4-Node: 6x U.2 per node



2-Node: 12x U.2 per node



4-Node: Rear View



FORM-FACTOR

Two or Four Nodes

Two sets of 12 U.2 drive bays; four sets of 6x U.2 or 10x E1.S drive bays



STORAGE

NVMe

Supported SSD form factor: E1.S, U.2 and optional M.2



CPU

2-Socket

Up to 2nd gen Intel® Xeon® Scalable processors; up to 205W TDP



I/O

Input/Output

Super I/O Module (SIOM) networking* with dedicated IPMI LAN port per node; Additional 2 PCI-E 3.0 x16 LP slots



MEMORY

24 DIMM Slots

Up to 6TB DDR4-2933MHz ECC memory per node; Intel® Optane™ DCPMM support available



POWER SUPPLY

Titanium Level

Up to redundant 2600W high-efficiency digital power supplies

Storage Bridge Bay

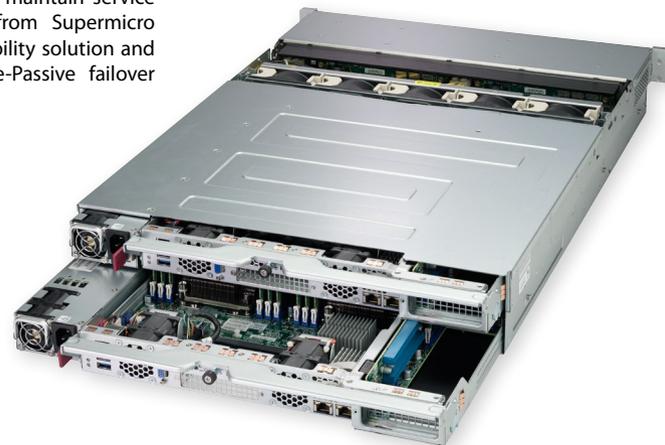
DUAL-PORT STORAGE FOR HIGH AVAILABILITY SOLUTIONS

The Supermicro Storage Bridge Bay is optimized to deliver the highest availability for mission-critical storage applications. The SBB is a fully redundant, 2U "cluster-in-a-box" system featuring dual hot-swappable nodes and 24 dual-port NVMe drives. All active components are hot-swappable with the SBB midplane providing heartbeat and data

connectivity which enables the surviving node to take over storage control and maintain service availability. Storage software from Supermicro partners completes a high-availability solution and provides Active-Active or Active-Passive failover configurations.



24x Dual-port U.2 Drive Bays



24x Dual-port U.2 Drive Bays

Better. Faster. Greener.

Expect Better Data Center Performance, TCO & Impact on the Environment



Systems featuring 2nd generation Intel® Xeon® Scalable processors

Supermicro offers the broadest and deepest portfolio of advanced technology server and storage systems in the IT industry. This offers several advantages to our customers. First, customers

can readily select the most optimized solutions to satisfy their business requirements, helping them to reduce their costs and improve the quality and time-to-market (TTM) of their offerings. Additionally,

the breadth and depth of Supermicro's product line provides the efficiency, cost, and reduced complexity advantages of one-stop shopping.



Supermicro®, the leading innovator in high-performance, high-efficiency server technology is a premier provider of advanced server Building Block Solutions® for Data Center, Cloud Computing, Enterprise IT, Hadoop/Big Data, HPC and Embedded Systems worldwide. Supermicro is committed to protecting the environment through its “We Keep IT Green™” initiative and provides customers with the most energy-efficient, environmentally-friendly solutions available on the market.

Learn more at www.supermicro.com

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