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
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 SDDs 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.

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 JBOD
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

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**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

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**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

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**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 12 DDR4 DIMM slots per node
Onboard 10 Gigabit Ethernet
Learn more on page 14
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.

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.

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1U systems featuring two CPU sockets and 24 DIMM slots
Support a wide range of SSD form factor including EDSFF, U.2, NF1 and M.2
Onboard 10 Gigabit networking with dedicated IPMI LAN ports
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.

1U Petascale JBOF
CAPACITY OPTIMIZED JBOF WITH FLAGSHIP DENSITY

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1U storage expansion chassis optimized for all-flash applications
Support up to 32 EDSFF or 2.5" U.2 NVMe SSDs
Two full-height PCI-E expansion slots with dedicated IPMI LAN ports
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/2U systems supporting dual processors with 24 DIMM slots
All-NVMe storage for up to 24x 2.5” U.2 SSDs in 2U or 12x 2.5” U.2 SSDs in 1U
Up to dual 25G Ethernet and rich PCI-E expansion possibilities
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 48 E1.S drives and 8 SATA M.2 drives. BigTwin also offers U.2 based models. The 2U, 4 node BigTwin with 6.25 NVMe drives per node maximizes I/O 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.

BigTwin also offers U.2 based models. The 2U, 4 node BigTwin with 6.25 NVMe drives per node maximizes I/O 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.

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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.

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.