SUPERMICRO INTELLIGENT EDGE SYSTEMS

Delivering Performance Close to the Data Source

Edge Systems Optimized for a Range of Environments with Intel® Xeon® Scalable Processors

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Executive Summary

As connected devices grow exponentially in numbers, processing at the local Edge is becoming critical to managing and processing large amounts of generated data to support demanding applications. As a result, Supermicro is leveraging advanced product designs to provide expandable, power-optimized, ultra-reliable computing with forward-thinking software platform partners, building application-ready solutions for multiple vertical markets.

Environmental conditions are much more challenging at the Edge than in a climate-controlled data center. Yet, Edge servers and IoT devices still need to perform as required while operating in these diverse conditions. Of course, as the processing power increases, the heat that needs to be also removed increases, requiring adequate cooling technologies. The systems are highly configurable and allow expansion with the necessary accelerator technology to enable AI/ML applications at the Edge.

SUPERMICRO

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 upon your requirements.

Edge Scenarios

Edge systems are showing up everywhere -- data collection and processing are moving away from large centralized installations like enterprise data centers. In addition, new technologies are moving quickly into everyday operations – in stores and factories, hospitals, the street corner, or train stations

Some of the more exciting areas where Edge computing is becoming part of day-to-day living are:

- Intelligent Retail
  - Improving customer experience using AI, augmented/virtual reality, digital signage, kiosks, and analytics
  - Providing disruptive AI-based solutions to help retailers and restaurants navigate technological and societal challenges
  - Enabling diverse use cases with an Edge architecture that supports many workloads on a single platform
  - Support for highly secure, Zero Trust, high availability systems to provide complete, optimized solutions – ensuring 100% uptime

Examples of Supermicro systems ideal for Edge computing in Intelligent Retail include:

SYS-E50
Compact Fanless

SYS-E100
Compact Fanless

E302
Fanless Intel® Xeon-D

E403 compact
Intel® Xeon-D/ Intel Xeon-SP
With 3 expansion slots

- Industry 4.0 / IoT
  - Supporting AI- and computer vision-based controls to improve quality, guard worker safety, and increase overall equipment efficiency
  - Solutions for device connectivity and intelligence at the Edge, enabling streamlined operation and increased automation
  - Supporting real-time soft programmable logic control (PLC) capabilities in a highly secure software-defined environment
  - Reliable operation of a wide range of optimized compute architectures in extreme environments for AI at the Edge

  Selected Supermicro servers that excel in Industry 4.0 environments:

  E302 Compact Fanless
  SYS-E302-9D

  E403 Wall-mount
  SYS-E403-12P-FN2T

  Compact Embedded
  SYS-510D-10C-FN6P

- Smart Cities and Spaces
  - Edge computing is distributed across multiple locations supporting transportation, security, venues, cities, and buildings
  - Fully outdoor capable (IP65) high performance compute, with Intel® Xeon D or 3rd Gen Intel® Xeon® Scalable processors and accelerator expansion options
  - Solutions to improve community safety and quality of experience (QoE) with innovative connected applications
  - AI inferencing and visual computing in outdoor Edge locations, enabling intelligent surveillance and accurate incident reporting for faster response times
  - Supporting V2X for parking, traffic, and pedestrian safety, autonomous vehicle support, and public transportation improvements

A selection of Supermicro servers that contribute toward smart cities and spaces:

E100 Compact Fanless
SYS-E100-12T-E

Hyper-E
SYS-220HE-FTNR

IP65 Outdoor Edge
SYS-E403-9D-16C-IPD2

Sizing

Intelligent IoT devices at various Edge points require different CPUs, GPUs, and cooling technologies and face physical size limitations. Therefore, the right-sizing of an Edge system is guided by the environment, dimensions, connectivity, and compute needs defined by the various workloads.

- Intelligent IoT Gateways for The Extreme Edge
  - Ultra-small systems for space-constrained locations include convenience stores, restaurants, factory automation, etc.
  - Fanless enclosure with a variety of I/O and networking options, highest reliability, and maintenance-free
  - Ideal for running workloads such as point-of-sale (PoS), inventory management, soft-PLC, or user-facing applications

- Compact Servers for Mainstream Installations
  - Small physical footprint and highly configurable for demanding locations
  - Processor options ranging up to the Intel® Xeon® D, plus networking I/O options, and PCI-E expansion slots
  - Capable of running a variety of intelligent Edge, SD-WAN, and security workloads

- High-Performance Rackmount
  - Short-depth rackmount systems in small spaces
  - Data center-class performance with up to dual 3rd Gen Intel® Xeon® Scalable processors, plus rich storage and full-size PCI-E expansion slots
  - Support for GPUs and other hardware accelerators to drive AI/ML applications and other demanding Edge workloads

The range of servers available for deployment at the intelligent Edge contains different CPUs in different form factors with varying amounts of I/O capacity, expansion slots, fans, and size. Below is a comparison of the most popular Supermicro Intelligent Edge servers with a sampling of their capabilities and design envelopes.

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Comparison of Features of Supermicro Edge Systems

Product Family Name	Example System	CPUs	Max. Memory	Network	Expansion	Fan/Fan-less	Dimensions
E50	E50-9AP	Intel® Atom® processor E3940	8GB	2 x GbE LAN	2x mini-PCI-E 2x M.2 slots	Fanless	5.82" x 1.72" x 4.64"
E100	SYS-E100-12T-E	11th Generation Intel® Core™ i5-1145GRE Processor	64GB	2 x 2.5 GbE LAN	3x M.2 slots	Fanless	7.68" x 1.73" x 5.94"
E302	SYS-E302-9D	Intel® Xeon® processor D-2123IT, 4-Core, 8 Threads, 60W	256GB	Quad 1GbE with Intel I350-AM4 Dual 10GBase-T with Intel X557 Dual 10G SFP+ via SoC	2x M.2 slots	Fanless	11.6" x 3.00" x 8.1"
E403	SYS-E403-12P-FN2T	3rd Gen Intel® Xeon® Scalable processors	2TB	2 x 10GbE	3 slots, 2x16 or 1x16+2x8	Fans	10.5" x4.3" x 16.0 "
510D	SYS-510D-10C-FN6P	Intel® Xeon® Processor D-1747NTE	256GB	4x 1GbE GbE 2x 25GbE SFP28	1xPCI-E 4.0 x 16, 2 x M.2 slots	Fans	17.2" x 1.7" x 9.8"
Ultra - Short Depth	SYS-210P-FRDN6T	3rd Generation Intel® Xeon® Scalable Processors	2TB	2x 10GbE ports & 4x 1GbE ports	Up to 3 PCI-E 4.0 FHHL & 2 HHHL slots for accelerator add-on cards, 1x M.2 slot	Fans	17.2" x 3.5" x 11.8"
Hyper-E	SYS-220HE-FTNR	2x 3rd Gen Intel® Xeon® Scalable Processors	8TB (12TB with Intel Optane PMem)	Up to 4 x 25GbE	Up to 6 slots	Fans	17.2 x 3.5" x 22.6"
SuperEdge	SYS-210SE-31A (3 nodes)	3rd Gen Intel® Xeon® Scalable processor (per node)	2TB (per node)	1x 1GbE (per node)	1x16 FHHL slots per node	Fans	17.7" x 3.5" x 16.9"
IP65	E403-9D-16C-IPD2	Intel® Xeon® D-2183IT processor	512GB	4 10G SFP+ LAN ports 9 RJ45 Gigabit Ethernet LAN ports 1 RJ45 Dedicated IPMI LAN port	1 PCI-E 3.0 x16 (FH3/4L) slots or 2 PCI-E 3.0 x 8, 1 PCI-E 3.0x16 (FH3/4L) slots, 3 M.2 slots	Fans	12.56" x 32.21" x 10.16"

Supermicro Family for IoT/Edge Deployments

SYS-E50-9AP
Intel Atom E3940
Compact, Fanless

SYS-E100-12T-E
Intel Core i3/i5/i7
IO rich, Fanless

SYS-E302-9D
Intel Xeon-D, Fanless

SYS-E403-12P-FN2T
3rd Gen Intel Xeon Scalable processors

SYS-510D-10C-FN6P
Intel Xeon-D
Short Chassis Depth

SYS-210P-FRDN6T
3rd Gen Intel Xeon Scalable processor
Single socket

SYS-220HE-FTNR
2x 3rd Gen Intel Xeon Scalable processors

SYS-210SE-31A
1x 3rd Gen Intel Xeon Scalable processor (per node)
Up to 3 Nodes

SYS-E403-9D-16C-IPD2
IP65 Outdoor system
5G, Smart City, Edge

Summary

Supermicro Edge solutions are designed for a wide range of environments and workloads. From small and fanless servers to multi-CPU servers, Supermicro delivers application-optimized systems that can be installed and maintained in various environments where the systems need to reside close to the data.

Additional Information

Supermicro IoT Edge Solutions - https://www.supermicro.com/en/products/iot-edge

Supermicro Compact and Industrial Solutions - https://www.supermicro.com/en/products/embedded/compact-and-industrial

Supermicro Fanless and IoT Gateway Solutions - https://www.supermicro.com/en/products/embedded/fanless-and-iot-gateway

SuperServer E50-9AP - https://www.supermicro.com/en/products/system/Box_PC/SYS-E50-9AP.cfm

SuperServer E100-12T-E - https://www.supermicro.com/en/products/system/Box_PC/SYS-E100-12T-E.cfm

SuperServer E302-9D - https://www.supermicro.com/en/products/system/Mini-ITX/SYS-E302-9D.cfm

SuperServer E403-12P-FN2T - https://www.supermicro.com/en/products/system/iot/box_pc/sys-e403-12p-fn2t

SuperServer 510D-10C-FN6P - https://www.supermicro.com/en/products/system/iot/1u/sys-510d-10c-fn6p

SuperServer 201P-FRDN6T - https://www.supermicro.com/en/products/system/iot/2u/sys-210p-frdn6t

SuperServer 220HE-FTNR - https://www.supermicro.com/en/products/system/hyper/2u/sys-220he-ftnr

SuperServer 201SE-31A - https://www.supermicro.com/en/products/system/iot/2u/sys-210se-31a

Outdoor Edge Systems - https://www.supermicro.com/en/products/outdoor-edge