SOLUTION BRIEF

SCALE UP YOUR HPC, AI, AND ML WORKLOADS WITH SUPERMICRO SUPERBLADE

Put up to 1.68 petaFLOPs per rack of supercomputing capacity into your data center with our performance and density-optimized solution with a resource-saving architecture

FOR HPC AND AI/ML WORKLOADS, SUPERMICRO AND AMD DELIVER:

- Up to 20 hot-pluggable nodes with Supermicro integrated enclosures
- Single 2nd or 3rd-Gen AMD EPYC processor with up to 280W TDP per node
- One AMD Instinct MI100 or MI210 GPU Accelerator per node
- 8 DIMM slots for up to 2 TB of memory per node
- Integrated InfiniBand fabric for up to 200-Gbps HDR bandwidth
- Redundant 2200W Titanium Level power supplies

Supermicro SuperBlade SBE-820H Enclosure with SBA-4119SG Nodes

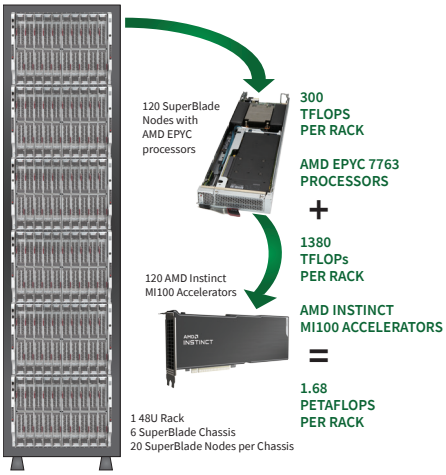
Enterprise data centers have long considered on-premises supercomputing capabilities a dream that is out of reach. Today, dreams can become reality with the Supermicro® A+ SuperBlade® platform powered by AMD EPYC™ processors and AMD Instinct™ MI100 accelerators. Equipped with the highest-performing x86 server CPU[1] and the world's fastest HPC GPU[2], you can run your AI/ML applications and reduce turnaround time with high 16-bit floating-point (FP16) matrix operations, speeding AI model training and inferencing. You can run high-performance computing (HPC) workloads and accelerate run times for processes such as EDA simulations with fast 64-bit floating-point (FP64) arithmetic. Even traditional enterprise workloads including database management systems and virtual desktop environments benefit from the computing density the platform delivers.

Supercomputing Within Reach

A single 48U rack of six SuperBlade platforms can support up to 120 SuperBlade nodes. When powered by 64-core AMD EPYC 7763 processors, you have up to 300 teraFLOPs of maximum theoretical computing power at your service. When you configure an AMD Instinct MI100 GPU in each node, you add 1380 teraFLOPs of maximum theoretical 64-bit floating-point performance per rack. The stunning total: 1.68 petaFLOPs per rack to speed your most compute-intensive AI, ML, and HPC workloads to completion. The SuperBlade Node prepares you for the future by being ready to accommodate the AMD Instinct MI210 GPU when available.

This density-optimized solution includes 200-Gbps InfiniBand for cluster connectivity and 25 Gigabit Ethernet switching for traditional IP traffic. The platform's resource-saving architecture significantly reduces initial and operational expenses through shared power and cooling, network management, and unparalleled node density.

SCALE UP TO 1.68 PETAFLOPS AND BEYOND



We deliver the broadest portfolio of the most high-performing, reliable servers with hyper-dense configurations that don't sacrifice the versatility you need to get your work done.

For workloads including training, inferencing, and HPC, the key getting more work done in a day is the AMD Instinct MI100 GPU Accelerator. The AMD Instinct MI100 GPU is AMD's most advanced accelerator with all-new AMD CDNA™ architecture with Matrix Core technology that offers superior performance for a full-range of mixed-precision operations. It's the world's fastest HPC accelerator with up to 11.5 TFLOPs of FP64 performance. Sixteen lanes of PCI-E 4.0 connectivity links the GPU with the CPU for maximum I/O bandwidth. Ultra-fast HBM2 GPU memory helps eliminate bottlenecks, with 1.2 TB/s of GPU memory bandwidth to support your largest data sets. The AMD ROCm™ open software platform supports the libraries your software needs, with optimized versions of PyTorch and TensorFlow. Update your software to use the ROCm platform once, and you can run it anywhere.

A+ SuperBlade SBE-820H Enclosure	
Form Factor	• 8RU, up to 20 hot-pluggable half-height 1-socket SuperBlade Nodes
Ethernet	• Up to 2 hot-pluggable 25/10/1 Gigabit Ethernet switches
InfiniBand	• Single 200-Gbps InfiniBand switch with one 200-Gbps link to each node and up to 20 200-Gbps uplinks
Chassis Management	• 1 chassis management module for remote system management
Power and Cooling	• 4, 6, or 8 hot-swappable 2200W Titanium Level (96% efficiency) power supplies

SBA-4119SG SuperBlade Node	
Form Factor	• Up to 20 nodes in one 8U enclosure
Processor Support	• Single socket SP3 for AMD EPYC 7002 and 7003 Series processors; up to 64 cores, up to 280W
Memory Capacity	• 8 DIMM slots, DDR4-3200, up to 2 TB registered ECC
Expansion	• 1 PCIe 4.0 x16 mezzanine card slot for optional high-performance networking • 2 PCI-E 4.0 x16 full-height full-length slots for 1 double-wide or 2 single-wide GPUs
Storage	• 1 NVMe/SATA3 M.2
I/O Ports	• 2x 25 Gigabit Ethernet LAN-on motherboard (LOM)
System Management	• IPMI 2.0 Aspeed 2500 / KVM over IP / Redfish API/TPM 2.0 / Supermicro SuperCloud Composer / Remote Chassis Management Module (CMM) / signed firmware

AMD Instinct™ MI100 GPU At a Glance

Compute Units	Stream Processors	Peak BFLOAT16	Peak INT4/INT8	Peak FP16 Matrix
120	7,680	Up to 92.3 TFLOPs	Up to 184.6 TFLOPs	Up to 184.6 TFLOPs
Peak FP32 Matrix	**Peak FP32**	**Peak FP64**	**Memory Size**	**Memory Bandwidth**
Up to 46.1 TFLOPs	Up to 23.1 TFLOPs	Up to 11.5 TFLOPs	32 GB HBM2	Up to 1.2 TB/s

FOOTNOTES

1. SPECjbb®2015-Distributed critical-jOPS comparison based on highest system results published as of 03/12/2021. Configurations: 20-node, 1x AMD EPYC 7763 (2561044 SPECjbb2015-Distributed critical-jOPS, 2919887 SPECjbb2015-Distributed max-jOPS, https://spec.org/jbb2015/results/res2021q1/jbb2015-20210225-00615.html) versus 2-node, 1x AMD EPYC 7702P (1877397 SPECjbb2015-Distributed critical-jOPS, 2656878 SPECjbb-Distributed max jOPS, https://spec.org/jbb2015/results/res2020q2/jbb2015-20200402-00533.html) for ~1.36x the performance. MLNWR-115
2. Calculations conducted by AMD Performance Labs as of Sep 18, 2020 for the AMD Instinct™ MI100 (32GB HBM2 PCIe® card) accelerator at 1,502 MHz peak boost engine clock resulted in 11.54 TFLOPS peak double precision (FP64), 46.1 TFLOPS peak single precision matrix (FP32), 23.1 TFLOPS peak single precision (FP32), 184.6 TFLOPS peak half precision (FP16) peak theoretical, floating-point performance. Published results on the NVidia Ampere A100 (40GB) GPU accelerator resulted in 9.7 TFLOPS peak double precision (FP64). 19.5 TFLOPS peak single precision (FP32), 78 TFLOPS peak half precision (FP16) theoretical, floating-point performance. Server manufacturers may vary configuration offerings yielding different results. MI100-03

For more information visit: supermicro.com/en/products/superblade