Large Language Models (LLM) to the AI Edge
AI GPU Solution Portfolio
Unlock Unprecedented Performance
Leveraging GPU Optimized Systems

GPU technology can bring unprecedented performance to a broad spectrum of workloads – up to 5X, 10X, … 100X improvements in performance and efficiency. These workloads span from the rapidly growing generative AI market to enterprise inferencing, product design, visualization, and to the intelligent edge. Supermicro has built a portfolio of workload-optimized systems for optimal GPU performance and efficiency across this broad spectrum of workloads.

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#1 GPU SOLUTIONS IN THE MARKET

8U HGX H100 8-GPU System
- Large Language Models (LLM)
- 900GB/s NVLink 7x better performance than PCIe
- 1:1 networking slots for GPUs up to 400Gbps each

4U HGX H100 4-GPU System
- HPC/AI Workloads
- Double-precision Tensor Cores delivering up to 268 teraFLOPS
- Superior thermal design and liquid cooling option

SuperBlade®
- Up to 20 GPUs in 8U
- Highest Density
- Multi-Node Architecture

2U MGX System
- Modular Building Block Platform Supporting Today’s and Future GPUs, CPUs, and DPUs

Petabyte Scale Storage
- Maximum density design to support up to 1PB in 2U
- Up to 32 E3.S NVMe drives in 2U

1U Grace Hopper System
- CPU+GPU
- Coherent Memory System
Large Scale AI Training Workloads

Generative AI, Natural Language Processing (NLP), Computer Vision

Workload Sizes

Extra Large

Liquid Cooled AI Rack Solutions
NVIDIA HGX™ H100 SXM 8-GPU
Up to 80 kW/Rack

Large

Liquid Cooling

8U 8-GPU System
NVIDIA HGX H100 SXM 8-GPU

Medium

HGX H100 4-GPU

4U 4-GPU System
NVIDIA HGX H100 SXM 4-GPU

Storage

Petabyte Scale Storage
High throughput and High Capacity for AI Data Pipeline
Use Cases

- Large Language Models (LLMs)
- Autonomous Driving Training
- Recommender Systems

Opportunities and Challenges

- Continuous growth of data set size
- High performance everything: GPUs, memory, storage and network fabric
- Pool of GPU memory to fit large AI models and interconnect bandwidth for fast training

Key Technologies

- NVIDIA HGX H100 SXM 8-GPU/4-GPU
- GPU/GPU interconnect (NVLink and NVSwitch), up to 900GB/s – 7x greater than PCIe 5.0
- Dedicated high performance, high capacity GPU memory
- High throughput networking and storage per GPU enabling NVIDIA GPUDirect RDMA and Storage.

Solution Stack

- DL Frameworks: TensorFlow, PyTorch
- Transformers: BERT, GPT, Vision Transformer
- NVIDIA AI Enterprise Frameworks (NVIDIA Nemo, Metropolis, Riva, Morpheus, Merlin
- NVIDIA Base Command (infrastructure software libraries, workload orchestration, cluster management)
- High performance storage (NVMe) for training cache
- Scale-out storage for raw data (data lake)

HGX H100 Systems

- H100 SXMS board with 4-GPU or 8-GPU
- NVLink & NVSwitch Fabric
- Up to 700W per GPU
Large Scale AI Training Workloads

Al Rack Solutions
Multi-Architecture Flexibility with Future-Proof Open-Standards-Based Design for POD, and SuperPOD with Liquid Cooling

Benefits & Advantages
- Proven AI rack cluster deployment in some of the world’s largest AI clusters
- AI POD, SuperPOD customizable architecture
- Turn-key proven solutions accelerates time to market
- Traditional, free-air and liquid cooled configurations for optimal TCE/TCO

Key Features
- Factory integrated and fully tested multi-rack cluster
- Server, storage, networking, software, management total solutions designed, built and deployed to your specification
- Rack Scale L11/L12 testing and validation
- Factory tuned power and cooling design
- Single source liquid cooling solution available with reduced (weeks) lead time
Large Scale AI Training Workloads

HGX H100 Systems
Multi-Architecture Flexibility with Future-Proof Open-Standards-Based Design

Benefits & Advantages

• High performance GPU interconnect up to 900GB/s - 7x better performance than PCIe
• Superior thermal design supports maximum power/performance CPUs and GPUs
• Dedicated networking and storage per GPU with up to double the NVIDIA GPUDirect throughput of the previous generation
• Modular architecture for storage and I/O configuration flexibility with front and rear I/O options

Key Features

• 4 or 8 next-generation H100 SXM GPUs with NVLink, NVSwitch interconnect
• Dual 4th Gen Intel® Xeon® Scalable processors or AMD EPYC™ 9004 series processors
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
• Innovative modular architecture designed for flexibility and futureproofing in 8U or 4U.
• Optimized thermal capacity and airflow to support CPUs up to 350W and GPUs up to 700W with air cooling and optional liquid cooling
• PCIe 5.0 x16 1:1 networking slots for GPUs up to 400Gbps each supporting GPUDirect Storage and RDMA and up to 16 U.2 NVMe drive bays

Medium

4U 4-GPU
NVIDIA HGX H100 SXM 4-GPU
6 U.2 NVMe Drives
8 PCIe 5.0 x16 networking slots
SYS-421GU-TNXR

Large

8U 8-GPU
NVIDIA HGX H100 SXM 8-GPU
16 U.2 NVMe Drives
8 PCIe 5.0 x16 networking slots
SYS-821GE-TNHR / AS-8125GS-TNHR
Petabyte Scale NVMe Flash

High Throughput and High Capacity Storage for AI Data Pipeline

Benefits & Advantages

- Maximum density design to support up to 1PB in 2U with next-generation drives
- Direct-attached EDSFF E3.S media for the best thermal and I/O performance
- Flexible topology allows distribution of PCIe lanes based on performance and density requirements

Key Features

- Dual 4th Gen Intel Xeon Scalable processors or single AMD EPYC™ 9004 Series processor
- Up to 32 E3.S NVMe drives in 2U
- Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
Petabyte Scale HDD
Top-Loading Data Lake Storage

Benefits & Advantages

- Fully redundant dual-ported high availability/failover clustering for use with Parallel File Systems
- Dual ported SAS architecture with 60 and 90 Bay configurations
- Top-loading drawer with tool-less drive brackets for easy servicing and maintenance
- Industry standard SAS controllers and expander infrastructure to support the most popular SDS platforms like ZFS and Lustre

Key Features

- Two hot-pluggable system nodes
- Dual 3rd Gen Intel® Xeon® Scalable processors per node
- 3 PCIe 4.0 x16 slots per node for I/O
2 HPC/AI Workloads

Simulation: Stress Analysis, Aerodynamics, Device Performance Prediction, Fluid Dynamics, Research, Exploration, Weather Prediction

Workload Sizes

**Large**

- **8U 8-GPU or 4U 4-GPU System**
  - NVIDIA HGX H100 SXM
  - 8-GPU or 4-GPU

**Medium**

- **4U/5U 8-10 GPU PCIe**
  - Maximum Performance and Flexibility

- **1U NVIDIA MGX™ System**
  - NVIDIA GH200 Grace Hopper with CPU+GPU Coherent Memory

SuperBlade™
Highest Density
Multi-Node Architecture
HPC/AI Workloads

Use Cases

- Manufacturing and engineering simulations (CAE, CFD, FEA, EDA)
- Bio/life sciences (genomic sequencing, molecular simulation, drug discovery)
- Scientific simulations (astrophysics, energy exploration, climate modeling, weather forecasting)

Opportunities and Challenges

- Infusing machine learning algorithms to HPC workloads to achieve faster results and discoveries with more iterations.
- Parallel processing with massive datasets for data-intensive simulations and analytics
- High-resolution and real-time visualization of scientific simulations and modeling

Key Technologies

- NVIDIA H100 (SXM, NVL, PCIe), L40S, A100
- NVIDIA Grace Hopper™ Superchip (Grace CPU and H100) with NVLink® Chip-2-Chip (C2C) interconnect
- Dual socket Intel and AMD-based solutions with high CPU core counts
- CPUs integrated with High Bandwidth Memory/bigger L3 cache
- PCIe 5.0 storage and networking
- Liquid cooling

Solution Stack

- NVIDIA HPC Software Development Kit (SDK)
- NVIDIA CUDA
- Commercial and in-house CAE software

HGX H100, H100 NVL, and H100 PCIe

- H100 SXM5 board with 4-GPU or 8-GPU (HGX H100)
- NVLink & NVSwitch Fabric (HGX H100)
- NVLink Bridge (H100 NVL or H100 PCIe)
- 80GB HBM3 (HGX H100 or H100 PCIe), 96GB HBM3 (H100 NVL) per GPU

GRACE HOPPER SUPERCHIP

- Grace Arm Neoverse V2 CPU
- NVIDIA H100 with NVLink-C2C
- Up to 480GB LPDDR5X and 96GB HBM3

L40S

- FHFL DW
- PCIe 4.0 x16
- 300W
- 48GB GDDR6
Benefits & Advantages

- Double-precision Tensor Cores delivering up to 535/268 teraFLOPS at FP64 in the 8-GPU/4-GPU respectively.
- TF32 precision to reach nearly 8000 teraFLOPs for single-precision matrix-multiplication.
- Superior thermal design and liquid cooling option supports maximum power/performance CPUs and GPUs.
- Dedicated networking and storage per GPU with up to double the NVIDIA GPUDirect throughput of the previous generation.

Key Features

- 4 or 8 H100 SXM GPUs with NVLink, interconnect with up to 900GB/s.
- Dual 4\textsuperscript{th} Gen Intel Xeon Scalable processors or AMD EPYC 9004 Series processors.
- Supports PCIe 5.0, DDR5, and Compute Express Link (CXL) 1.1+.
- Innovative modular architecture designed for flexibility and futureproofing in 8U, 5U, or 4U.
- Optimized thermal capacity and airflow to support CPUs up to 350W and GPUs up to 700W with air cooling and optional liquid cooling.
- PCIe 5.0 x16 1:1 networking slots for GPUs up to 400 Gbps each supporting GPUDirect Storage and RDMA, and up to 16 U.2 NVMe drive bays, high throughput data pipeline and clustering.
8U SuperBlade® - Highest Density Multi-Node Architecture for HPC, AI and Cloud Applications

Benefits & Advantages
• Up to 20 nodes in 8U – 100 blades per rack
• Single NVIDIA H100 PCIe GPU per blade
• High CPU to GPU ratio
• Integrated power, cooling, switch and management console
• Up to 95% cable reduction compared to traditional rackmount servers

Key Features
• 1 H100 or L40S PCIe GPU per blade
• Single 4th Gen Intel® Xeon® Scalable processor per blade
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1
• Flexible storage options including U.2 NVMe, SAS including M.2 NVMe and EDSFF E1.S
• Shared power, cooling and switch for maximum efficiency with optional liquid cooling
• 2-port 25GbE (3rd and 4th LAN), 1x 200G HDR InfiniBand or 1x 100G EDR InfiniBand via mezzanine card
HPC/ AI Workloads

1U Grace Hopper MGX Systems
CPU+GPU Coherent Memory System for AI and HPC Applications

Benefits and Advantages

- Up to 2 NVIDIA GH200 Grace Hopper Superchips featuring 72-core CPU and H100 Tensor Core GPU tightly coupled with coherent memory
- NVLink® Chip-2-Chip (C2C) high-bandwidth and low-latency CPU-GPU interconnect
- Energy efficient 1000W per Grace Hopper Superchip with air cooling and liquid cooling options.
- Supports NVIDIA BlueField®-3 or ConnectX®-7 for fast clustering and advanced data processing with E1.S drives

Key Features

- Up to 144 Grace Arm Neoverse V2 CPU cores in 1U
- NVIDIA H100 Tensor Core GPU with 96GB of HMB3 or 144GB of HBM3e (coming soon) per node
- NVLink-C2C with 900GB/s of CPU-GPU interconnect and up to 576GB (480GB LPDDR5X + 96GB HMB3) of fast-access memory available to the GPU
- Up to 3 PCIe 5.0 x16 slots (1U 1-node) or 2 PCIe 5.0 x16 slots per node (1U 2-node)
- Up to 8 hot-swap E1.S drives and 2 M.2 NVMe drives
10 GPU Systems
4U/5U 8 or 10 GPU PCIe - Maximum Performance and Flexibility

Benefits & Advantages

- 13 PCIe 5.0 x16 slots with up to 10 PCIe FHFL GPUs supporting 8 NVIDIA H100 NVL (4 NVLink Bridge pairs) or 10 H100 PCIe GPUs.
- 4U or 5U configurations with superior thermal design supporting max power/performance CPUs and GPUs at up to 32°C ambient temperature with optional air cooling
  - Single Root, Dual Root or Direct Connect GPU configurations

Key Features

- Up to 8 or 10 H100 PCIe GPUs with optional NVLink Bridge (H100 NVL), or up to 10 L40S
- Dual 4th Gen Intel Xeon Scalable processors or AMD EPYC 9004 Series processors
- Supports PCIe 5.0 DDR5 and Compute Express Link 1.1+
- Configurable with 2 400G networking per root (4 for Dual Root) and Advanced I/O Module (AIOM) slot for high throughput data pipeline and clustering
Enterprise AI Inferencing & Training

Generative AI Inference, Large Language Model Inference, Speech Recognition, Recommendation, Computer Vision

Workload Sizes

Extra Large

4U/5U 8-10 GPU PCIe
GPU-based Inference and Training

Large

6U SuperBlade®
High Density, Disaggregated

Medium

2U MGX System
Modular Building Block
Platform Supporting Today’s and Future GPUs, CPUs, and DPUs

2U Grace MGX System
Modular Building Block
Platform with Energy-efficient Grace CPU Superchip
Use Cases
- Content creation (image, audio, video, writing)
- AI-enabled office applications and services
- Enterprise business process automation

Opportunities and Challenges
- Total solution complexity
- Open architecture, vendor flexibility, and fast deployment for rapidly evolving technologies
- High computational and resource costs, cloud vs. on-prem
- Utilization of frameworks, pre-trained or open-source AI models with fine-tuning

Key Technologies
- NVIDIA H100 (NVL, PCIe), A100, L40S, L40, and L4 GPUs
- PCIe 5.0 storage and networking
- Intel and AMD CPU options
- NVIDIA Grace™ Superchip (2 Grace CPUs on one Superchip) with NVLink® Chip-to-Chip (C2C) interconnect
- Flexible rackmount servers from 1U to 6U to balance compute, storage, and networking for various enterprise AI workload needs

Solution Stack
- NVIDIA AI Enterprise software
- NVIDIA NGC™ catalog: containers, pre-trained models
- RedHat OpenShift, VMWare

H100 NVL
- 2 FHFW H100 GPU with NVLink Bridge (4x faster than PCIe)
- PCIe 5.0 x16
- 400W per GPU
- 94GB HBM3 per GPU

H100 PCIe
- FHFL DW
- PCIe 5.0 x16
- 300W per GPU
- 80GB HBM2e

L40S\L40
- FHFL DW
- PCIe 4.0 x16
- 350W (L40S)/300W (L40)
- 48GB GDDR6

L4
- HHHL SW
- PCIe 4.0 x16
- 72W
- 24GB GDDR6
10 GPU Systems
4U/5U 8 or 10 GPU PCIe — Highly Flexible Architecture

Benefits & Advantages

• Up to 13 PCIe 5.0 slots for flexible GPUs, I/O and networking options
• 4U or 5U configurations with superior thermal design supporting max power/performance CPUs and GPUs at up to 32°C ambient temperature with air cooling
• Single Root, Dual Root or Direct Connect GPU configurations

Key Features

• Up to 8 or 10 H100 PCIe GPUs with optional NVLink Bridge (H100 NVL), or L40S
• Dual 4th Gen Intel® Xeon® Scalable processors or AMD EPYC™ 9004 Series processors
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
• Optimized thermal capacity and airflow to support CPUs up to 350W and GPUs up to 700W with air cooling.

8-10 GPU (PCIe)
8 NVIDIA H100 NVL
or 10 H100 PCIe
8 NVMe and 8 SATA Drives
32 DIMMs DDR5-4800
SYS-421GE-TNRT / AS-4125GS-TNRT / SYS-521GE-TNRT
6U SuperBlade®
SuperBlade® - Highest Density Multi-Node Architecture for HPC, AI and Cloud Applications

Benefits & Advantages
- Up to 10 single-width nodes in 6U with up to 2 GPUs per blade, or 5 double-width nodes with up to 4 GPUs per blade
- Integrated power, cooling, switch and management console
- Up to 95% cable reduction compared to traditional rackmount servers
- High CPU to GPU Ratio

Key Features
- Up to 2 H100 PCIe or L40S GPUs per blade
- Single 4th Gen Intel® Xeon® Scalable processor per blade
- Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
- Flexible storage options including U.2 (NVMe, SAS, SATA), M.2 (SATA/NVMe), and EDSFF E1.S
- Shared power, cooling and switch for maximum efficiency with optional liquid cooling
- Flexible networking up to 400G NDR InfiniBand
2U x86 MGX Systems

Modular Building Block Platform Supporting Today’s and Future GPUs, CPUs, and DPUs

Benefits & Advantages

- NVIDIA MGX reference design enabling to construct a wide array of platforms and configurations
- 7 PCIe 5.0 x16 slots in 2U with up to 4 PCIe FHFL DW GPUs and 3 NICs or DPUs.
- Supports both ARM and x86-based configurations and is compatible with current and future generations of GPUs, CPUs, and DPUs

Key Features

- Up to 4 H100 PCIe GPUs with optional NVLink Bridge (H100 NVL), L40S, or L40
- Up to 3 NVIDIA ConnectX-7 400G NDR InfiniBand cards or 3 NVIDIA BlueField®-3 cards
- Dual 4th Gen Intel Xeon Scalable processors
- 8 hot-swap E1.S and 2 M.2 slots
- Front I/O and Rear I/O configuration
- Supports PCIe 5.0 DDR5 and Compute Express Link 1.1+
2U Grace MGX System
Modular Building Block Platform with Energy-efficient Grace CPU Superchip

Benefits & Advantages
- Two NVIDIA Grace CPUs on one Superchip with 144-core and up to 500W CPU TDP
- 900GB/s NVLink® Chip-2-Chip (C2C) high-bandwidth and low-latency interconnect between Grace CPUs
- NVIDIA MGX reference design enabling to construct a wide array of platforms and configurations
- 7 PCIe 5.0 x16 slots in 2U with up to 4 PCIe FHFL DW GPUs and 3 NICs or DPUs.

Key Features
- Up to 144 high-performance Arm Neoverse V2 Cores with up to 960GB LPDDR5X onboard memory
- Up to 4 H100 PCIe GPUs with optional NVLink Bridge (H100 NVL), L40S, or L40
- Up to 3 NVIDIA ConnectX-7 400G NDR InfiniBand cards or 3 NVIDIA BlueField®-3 cards
- 8 hot-swap E1.S and 2 M.2 slots
- Front I/O and Rear I/O configuration
Visualization and Omniverse Workloads
Real-Time Collaboration, 3D Design, Game Development

Workload Sizes

Large

4U/5U 8 GPU
Tailored Architecture for NVIDIA Omniverse™

Medium

2U Hyper
4 FHFL DW GPUs
Compute Optimized Architecture

GPU Workstation
4-GPU Rackmount/Full Tower
Use Cases

- Game development
- Product design
- City planning/architectural
- Digital twins (manufacturing, assembly lines, logistics)

Opportunities and Challenges

- AI-aided game development and asset generation
- Closer to real world scenarios
- Integrated engineering
- Enterprise-scale simulations
- Lower latencies
- Cloud collaboration opportunities

Key Technologies

- NVIDIA OVX™ certified architecture
- NVIDIA L40S, L40, and RTX 6000 Ada GPUs
- NVIDIA BlueField®-2, or BlueField®-3 (DPU)
- NVIDIA RTX GPUs with ray tracing
- Rack-scale integration

Solution Stack

- Universal Scene Description Connectors
- NVIDIA Omniverse™ Enterprise

Visualization and Omniverse Workloads

L40S
- FHFL DW
- PCIe 4.0 x16
- 350W
- 48GB GDDR6

L40
- FHFL DW
- PCIe 4.0 x16
- 300W
- 48GB GDDR6

RTX 6000 ADA
- Graphics, Ray Tracing
- FHFL DW
- PCIe 4.0 x16
- 300W
- 48GB GDDR6
Omniverse Optimized Systems
Highest Performance, Tailored for NVIDIA Omniverse™

Benefits & Advantages

- New next-generation purpose-built system for NVIDIA Omniverse™ Enterprise
- Optimized for power immersive, photorealistic 3D models, simulations, and digital twins
- Flexible storage configurations
- Up to 2x more storage and I/O flexibility

Visualization and Omniverse Workloads

4U/5U 8 GPU (PCIe)
8 NVIDIA L40S/L40 PCIe
3 NVIDIA ConnectX-7
16 U.2 NVMe drives
SYS-421GE-TNRT / AS-4125GS-TNRT / SYS-521GE-TNRT

Key Features

- 8 NVIDIA L40S/L40 PCIe GPUs
- Dual 4th Gen Intel® Xeon® Scalable processors or AMD EPYC™ 9004 Series processors
- Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
- 3 NVIDIA ConnectX-7
- Optimized thermal capacity and airflow to support CPUs up to 350W and GPUs up to 700W with air cooling.
- 16 U.2 NVMe drive bays
2U Hyper Systems
Hyper - Flagship Performance Rackmount System
Designed for Ultimate Flexibility

Benefits & Advantages
• Highly flexible modular architecture
• Compute optimized design for maximum airflow
• Maximum availability of PCIe lanes for GPUs and networking
• Tool-less platform for ease of configuration and servicing

Key Features
• Up to 4 NVIDIA L40S/L40 GPUs
• Dual 4th Gen Intel® Xeon® Scalable processors or AMD EPYC™ 9004 Series processors
• Optimized thermal capacity and airflow to support CPUs up to 350W with GPUs up to 350W with air cooling
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
• Advanced I/O Module (AIOM) for flexible networking options - OCP 3.0 SFF compatible
AI Workstations
4-GPU 5U Full-Tower Rackmount Workstation

Benefits & Advantages
- Powerful, compact configuration optimized for Omniverse and AI development
- Rackmount data center server performance in portable tower form factor
- Ideal for office, school, lab or field deployment
- NVIDIA qualified system

Key Features
- 4 NVIDIA L40S/L40 PCIe GPUs
- Dual 4th Gen Intel Xeon Scalable processors
- Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
- 8 3.5" hot-swap NVMe/SATA/SAS and 2 M.2 slots
- 4 PCIe 5.0 x16 double-width slots (for GPUs) and 3x PCIe 5.0 x16 single-width slots for maximum flexibility
- On-board 10GbE LAN
Graphic Workstations
4-GPU 5U Full-Tower Rackmount Workstation

Benefits & Advantages

• Versatile and flexible configuration for a range of media, visualization and AI workloads
• High core count to support maximum I/O for PCIe expansion, M.2 storage and SATA drive bays
• NVIDIA Certified platform

Key Features

• 4 NVIDIA RTX™ 6000 Ada or A6000 GPUs
• Single AMD Ryzen Threadripper PRO processor up to 64 cores
• 4 PCIe 4.0 x4 M.2 slots + 6 SATA drive bays
• Onboard 10GbE LAN
• Optional CPU liquid cooling
5 Video Delivery Workloads

Content Delivery Networks (CDNs), Transcoding, Compression, Cloud Gaming/Streaming

Workload Sizes

Large

BigTwin® 2U 4-Node
Content Delivery Networks

Medium

CloudDC 2U UP
Streaming and Transcoding

Small

Hyper-E 2U DP
Edge Video
Use Cases

- Content delivery networks
- 8K, 4K streaming, livebroadcast
- High resolution, high framerate cloud gaming and streaming

Opportunities and Challenges

- Save data bandwidth and reduce delivery delays
- Faster, more efficient transcoding and compression
- Reduce power consumption and infrastructure cost

Key Technologies

- GPU media engines with transcoding acceleration including AV1 encoding and decoding
- NVIDIA L40, L4, and RTX GPUs
- NVIDIA BlueField®-2 or BlueField-3 (DPU)
- Dense, resource-saving multi-node, multi-GPU systems for space and power efficiency
- High-capacity, high-throughput hot-swap storage

Solution Stack

- Red Hat, VMWare
- Container orchestration and management
- SDKs to accelerate and optimize decoding, encoding and transcoding workloads
BigTwin® 2U 4-Node

BigTwin – Award Winning Multi-Node System with Resource Saving Architecture

Benefits & Advantages

• Multi-node form factors optimized for compute or storage density
• Dual processors per node
• Free-air cooling and liquid cooling options
• Front hot-swap storage drives and rear hot-swap server nodes

Key Features

• Up to 1 GPUs per node
• Dual 4th Gen Intel® Xeon® Scalable processors per node
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
• 2 PCIe 5.0 x16 (LP) slots
• 6 NVMe drives per node (2U4N) or 12 NVMe drives per node (2U2N)
• Networking via AIOM (OCP 3.0 compatible) per node
2U CloudDC UP
CloudDC - All-in-one Platform for Cloud Data Centers

Benefits & Advantages
• UP architecture for maximum performance with a single CPU
• Superior thermal design - Supports maximum power/performance CPUs and GPUs
• Flexible I/O and storage options supporting convenient serviceability with tool-less brackets and hot-swap drive bays

Key Features
• Up to 6 GPUs
• Single 4th Gen Intel® Xeon® Scalable processor or AMD EPYC™ 9004 Series processor
• Optimized thermal capacity and airflow to support CPUs up to 350W and GPUs up to 350W with air cooling
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1+
• 16 DIMM slots DDR5
• Advanced I/O Module (AIOM) for flexible networking options (OCP 3.0 compatible)
Video Delivery Workloads

2U Hyper-E
Hyper-E- High Performance and Flexibility at the Edge

Benefits & Advantages

• Short-depth chassis ideal for edge deployments
• Front I/O with rear storage access
• AC and DC power options

Key Features

• 3 NVIDIA L40S/L40 PCIe GPUs
• Dual 4\textsuperscript{th} Gen Intel\textsuperscript{®} Xeon\textsuperscript{®} Scalable processors
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1
• 32 DIMM slots DDR5.
• Networking via AIOM (OCP 3.0 compatible)
Video Delivery Optimized Storage

Highly Efficient Sustainable Flash
For read-intensive content delivery

Benefits & Advantages

• Maximum density design to support up to 1PB in 2U with next-generation drives
• CPUs with built-in Intel Accelerator Engines to offload storage functions and improve performance
• Flexible topology allows distribution of PCIe lanes based on performance and density requirements

Key Features

• Dual 4th Gen Intel® Xeon® Scalable processors or single AMD EPYC 9004 Series processors
• Supports PCIe 5.0, DDR5 and Compute Express Link (CXL) 1.1
• Up to 24 drives in 1U or 32 drives in 2U
• 2 PCIe 5.0 x16 slots + 2 PCIe 5.0 x16 AIOM slots
Video Delivery Optimized Storage

Scale-Out Origin Storage
For active archive, user-licensed content, copyright compliance

Benefits & Advantages
- Storage Bays divided between 2x nodes to create scale-out architectures with maximum density
- Optimal Configurations using 30 or 45 HDD per node
- Top-loading drawer with tool-less drive brackets for easy servicing and maintenance
- Designed to be maintained with minimal datacenter staff

Key Features
- Dual node twin design
- Dual 3rd Gen Intel® Xeon® Scalable processors per node
- 3 PCIe 4.0 x16 slots per node for I/O
- Designed to be maintained with minimal datacenter staff

4U 30/45-Bay Top-Loading
SSG-540P-E1CTR45L
AI Edge Workloads
Edge Video Transcoding, Edge Inference, Edge Training

Workload Sizes

Extra Large
Hyper-E
Multi-GPU Inferencing and Training

Large
Compact
Multi-GPU Inferencing

Medium
Short-Depth Multi-GPU Edge Server

Small
Embedded
CPU (or ASIC) based Inference
Use Cases

- Video processing: decode, encode, and transcode
- Edge inference: vision, speech, anomaly detection, etc.
- Markets: security and surveillance, retail, manufacturing, healthcare, and medical devices

Opportunities and Challenges

- Size, weight, and power constraints
- Data throughput for video and audio
- Cost of storage, bandwidth constraints
- Latency impacting decision response times
- Data security, privacy, and sovereignty laws
- Resiliency in face of network outages
- Long product lifecycle requirements

Key Technologies

- CPU or GPU-based AI edge Inferencing, GPU-based AI edge training, and video transcoding/encoding/decoding
- NVIDIA L4, L40S, L40, A30, A40, T4, A2 GPUs
- Short-depth chassis design for edge locations with AC or DC power supply options
- Front I/O with broad range of expansion and I/O port for flexibility and serviceability
- Ruggedized systems designed to be placed outside of the data center

Solution Stack

- NVIDIA® TensorRT™ and Triton Inference Server
- NVIDIA DeepStream, Clara, Merlin, Metropolis, Morpheus, Omniverse, and Riva
- NVIDIA Fleet Command
- Intel® OpenVINO

AI Edge Workloads

L40S
- FHFL DW
- PCIe 4.0 x16
- 350W
- 48GB GDDR6

L40
- FHFL DW
- PCIe 4.0 x16
- 300W
- 48GB GDDR6

L4
- HHHL SW
- PCIe 4.0 x16
- 72W
- 24GB GDDR6
Short-Depth 5G/Edge & Hyper E

Compute and AI Performance at the Edge

Benefits & Advantages

• High-density systems for data center level performance at the Edge
• Flexible configurations with broad AI accelerator and AOC options
• Front I/O for easier serviceability in space-constrained environments
• Short-depth chassis design for easy deployment at edge locations
• Redundant AC or DC power supply options

SYS-111E-FWTR
1U Compact Edge/5G Server
2 NVIDIA L4
2 Internal Drive Bays
8 DIMMs DDR5-4800

2U Hyper-E
3 NVIDIA H100 PCIe
6 NVMe drives
32 DIMMs DDR5-4800

Key Features (SYS-111E-FWTR)

• Single 4th Gen Intel® Xeon® Scalable processor
• Dual 10 GbE connectivity
• Flexible configuration with 3 PCIe 5.0 x16 slots (2x FHFL and 1x LP)
• NEBS Level 3 design
• AC and DC power options available

Key Features (Hyper-E)

• Dual 4th Gen Intel® Xeon® Scalable processors
• Flexible network options with 2 AIOM slots
• 3 PCIe 5.0 x16 FHFL double-width slots or 6 single-width slots 2 PCIe 5.0 single width FHHL slots
Fanless and Wallmount Edge
Compact Systems for the Intelligent Edge

Benefits & Advantages
- Compact form factors for deployments at the edge and remote edge
- Designed for ruggedized environments outside the data center
- Deliver low-latency AI inferencing for intelligent edge applications
- Broad range of expansion and I/O port options

SYS-E100-13AD
Ultra-compact Fanless Edge Server
CPU (or ASIC) based Inference

Key Features (SYS-E100-13AD)
- 12th Gen Intel® Core™ processors
- Fanless design for best durability and silent operations
- 3 M.2 expansion slots (NVME, Wi-Fi, LTE/5G)
- USB, HDMI, DP, COM and GPIO ports

SYS-E403-13E
Powerful expandable Server for the Edge
1 NVIDIA L40S OR 2 NVIDIA L4
8 DIMM slots DDR5-4800
4 NVMe Drives

Key Features (SYS-E403-13E)
- 4th Gen Intel® Xeon® Scalable processor
- 3 PCIe 5.0 x16 FHFL slots
- Dual 10 GbE Ethernet
- Optional wall-mounted installation
AI GPU WORKLOADS

LARGE SCALE AI TRAINING

HPC

ENTERPRISE AI INFERENCING & TRAINING

VISUALIZATION AND OMNIVERSE

VIDEO DELIVERY

EDGE

CPU OPTIMIZED

MULTI-NODE BUILDING BLOCKS

RACKMOUNT BUILDING BLOCKS

EDGE OPTIMIZED
NVIDIA GPUs

**LARGE SCALE AI TRAINING & HPC**

- **H100 SXM5**
  - 4 or 8 H100 GPU Board
  - NVLink & NVSwitch Fabric
  - PCIe 5.0
  - 700W per GPU
  - 80GB HBM3 per GPU

- **H100 NVL**
  - 2 FHFL
  - H100 GPU with NVLink Bridge
  - (4x faster than PCIe)
  - PCIe 5.0
  - 400W per GPU
  - 94GB HBM3 per GPU

**TRAINING & INFEERENCE**

- **H100 PCIe**
  - FHFL DW
  - PCIe 5.0 x16
  - 350W
  - 80GB HBM2e

- **L405**
  - FHFL DW
  - PCIe 4.0 x16
  - 350W
  - 48GB GDDR6

- **L40**
  - FHFL DW
  - PCIe 4.0 x16
  - 300W
  - 48GB GDDR6

- **RTX 6000 ADA**
  - FHFL DW
  - PCIe 4.0 x16
  - 300W
  - 48GB GDDR6

**OMNIVERSE**

- **L4**
  - HHHL SW
  - PCIe 4.0 x16
  - 72W
  - 24GB GDDR6

**VIDEO DELIVERY**

**EDGE**
# Supermicro System GPU Compatibility

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<th>H100 (PCIe)</th>
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Better Performance Per Watt and Per Dollar

First-to-Market Innovation with the Highest Performance Server Designs

Reduced Environmental Impact and Lower TCO

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