DATA CENTER SOLUTIONS
EXTENSIVE IN-HOUSE DESIGN CAPABILITIES

ASUS has substantial resources on tap to respond quickly to fulfill almost any customization requirement, employing top-tier components, fostering strong ecosystem partnerships, implementing feature-rich designs and utilizing superior in-house design expertise for tailored solutions.

WORLD-CLASS CUSTOMIZATION ABILITY

ASUS retains a dedicated global R&D team refining servers in 113 countries through 70+ branches, supported by 1,400+ customer assistance centers. Our talent pool includes hardware, thermal, testing engineers, and software specialists, ensuring top-quality products worldwide.

ASUS is dedicated to reducing the total cost of ownership (TCO) to business, through more environmentally sustainable and higher-performance designs. In 2020 alone, ASUS received 69,965 green certifications from leading global organizations.

TCO-OPTIMIZED DESIGNS

ASUS is part of the global RE100 initiative, and strives for 100% renewable energy for all that we do. We’re building on that ambition with our latest data center innovations, spearheading digital transformation across diverse applications from telecoms and finance to transportation and mission-critical medical systems.

Mission

EMBRACE THE INCREDIBLE FUTURE WITH ASUS DATA CENTER SOLUTIONS

ASUS stands at the forefront of the AI revolution. With seamlessly integrated solutions tailored for enterprises, we’re here to guide you on your AI journey with confidence, innovation and endless possibilities.

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1995 Tier 1 OEM/ODM
2000 Data center OEM/ODM
2005 ASUS white-label solution
2008 First delivery of server products to leading cloud-service provider
2010 Joined Open Compute Project 1.0 development
2011 Launched BMC solution – ASMB6-iKVM
2012 Released supercomputing, big data and storage server solutions
2013 Launched BMC solution – ASMB7-iKVM
2014 Achieved Green500 Top 1 with ESC4000-G2S
2015 Launched ASUS System Web-based Management (ASWM)
2016 Released GPU servers for deep learning, AI and VDI
2017 Won 2017 Taiwan Excellence Award for server products
2018 First delivery of server products to medical provider
2019 Joined RedHat technology partnership
2020 Joined Ubuntu technology partnership
2021 Launched BMC solution – ASMB8-iKVM
2022 World records on MLPerf training and inference
2023 Won project for FORERUNNER 1 supercomputer to accelerate AI 2.0 era

Milestone

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ASUS leads the AI revolution, powered by our partnership with NVIDIA®, a global AI computing leader. Leveraging NVIDIA’s groundbreaking technology, we maximize GPU acceleration, simplifying complex AI tasks. From AI data centers to seamless enterprise solutions, we’re innovating at every step. Engineered with an innovative modular architecture, ASUS NVIDIA MGX™ servers offer unparalleled flexibility and scalability to accommodate various server configurations, significantly enhancing AI-driven data centers, HPC and Omniverse applications with game-changing performance and memory capabilities.

Elevating AI Success with NVIDIA MGX™ Solutions

Make ASUS Your AI Supercomputing Partner

Ultimate Flexibility

MGX, an open, flexible and future compatible reference design provides a single, future-compatible architecture. Thanks to the modular architecture, offering 160 configurations, clients can tailor the AI solution to precise needs. MGX provides a new standard for modular server design by improving ROI and reducing time to market.

Toolless Design

ASUS offers an exclusive toolless M.2 design that ensures seamless operation with its screwless design featuring a latch-and-lock mechanism, allowing for quick installation in just three seconds, while also enabling easy dismantling of the fan bar either individually or as a whole group. This promotes effortless troubleshooting, ultimately streamlining maintenance tasks.

Easy Maintenance

The middle-plane board design facilitates easy maintenance by eliminating the need to remove fans or cables and providing clear visibility of each cable’s location, thus obviating the need to dismantle the fan bar. Unlike traditional maintenance methods, which often entail disassembling numerous structural parts before repair, the middle-plane design streamlines the process, resulting in reduced power-cable usage.

ESC NM1-E1

2U Single Grace Hopper CPU+GPU superchip MGX system

- Form Factor: 2U
- Superchip CPU Number: 1
- Memory Size: 480GB
- GPU Memory: 96GB
- NVMe: 4 x U.2 (by BF3 or Raid Card)
- Cooling: Air Cooled

ESC NM2-E1

2U Dual Grace Hopper CPU+GPU superchip MGX system

- Form Factor: 2U
- Superchip CPU Number: 2
- Memory Size: 960GB
- GPU Memory: 288GB
- NVMe: 4 x U.2 (by BF3 or Raid Card)
- Cooling: Air Cooled
ASUS meets global data center demands with accelerated computing by integrating 5th Gen Intel® Xeon® processors to provide a diverse array of workload-optimized servers and motherboards. Committed to AI technology growth, ASUS delivers quality server solutions for a sustainable future.

**RS720Q-E11-RS8U**

**Massive computing performance for diverse AI workloads**

- **CPU**: 4th Gen Intel® Xeon® Scalable processors
- **Memory Type**: Per node: 16 x DIMM slots
  - 4th: DDR5 4800 MHz RDIMM/3DS RDIMM (1DPC)
  - 5th: DDR5 5600/4800 MHz RDIMM/3DS RDIMM (1DPC)
- **Maximum Memory**: 4096GB
- **Drive bays**: 8
- **Networking**: Per Node: 2 x Intel X710-AT2 Gigabit LAN Controller, 1 x Management Port

**ESC N8-E11**

**Powerful AI server reduces data-center PUE**

- **CPU**: 4th Gen Intel® Xeon® Scalable Processor Family (up to 350W)
- **Memory Type**: Per node: 32 x DIMM, DDR5 4400 RDIMM
- **Drive bays**: 10
- **Networking**: Per Node: 2 x 10 Gigabit LAN ports (Intel X710-AF2 Controller), 1 x Management Port

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**HPC Data Center Solutions with 5th Gen Intel Xeon Scalable Processors**

**Superior Performance**
- Supports the highest-performance CPUs and GPUs and the latest PCIe 5.0, DDR5, CXL 1.1 technologies
- Extends I/O availability and high-bandwidth memory for more computing capability

**Scalable Storage Solutions**
- Locks SSD RAID performance with SupremeRAID™ technology, with support for up to 24 NVMe
- More scalable options in middle and rear bays

**Comprehensive Cooling Solutions**
- New HDD tray and independent airflow tunnel design deliver energy-efficient performance
- Immersion and direct-to-chip (D2C) liquid-cooling solutions for improved PUE and reduced operational costs

**Multiple GPU and FPGA Support**
- Flexible design to configure PCIe 5.0 x16 slots for specific workloads
- GPU servers designed with space optimization for liquid-cooling solutions
- Stand-out AI training and inference performance proved by MLPerf benchmark

**Boosted Performance**

- 21% average performance gain at the same TDP as 4th Gen Intel® Xeon® processors

**Supercharged Memory Speed**

- Up to 16% memory bandwidth improvement and 2.7X increased last-level cache vs. 4th Gen Intel® Xeon® processors

**Faster AI Deployment**

- Up to 14X better AI training and inference performance vs. 3rd Gen Intel® Xeon® processor

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1. Average performance gain as measured by the geomean of SPEC CPU rate, STREAM Triad, and LINPACK compared to 4th Gen Intel Xeon processor. See G1 at https://www.intel.com/ processorclaims: 5th Gen Intel Xeon Scalable processors. Results may vary.
4. Based on performance gains of 4.4x to 14.2x for training ResNet50V1.5, BERT Large, SSD-ResNet34, RNN-T, MaskRCNN, and DLRM and up to 2.7X for inference (BERTSmall/1.5, BERT Large, SSD-ResNet34, RNN-T BF16) compared to 3rd Gen Intel® Xeon® processor. See A15-A16 at https://www.intel.com/ processorclaims: 5th Gen Intel Xeon Scalable processors. Results may vary.

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1. LATEST SOLUTIONS
2. Form Factor
3. CPU Number
4. PCIe x16 slots
5. Form Factor
6. CPU Number
7. PCIe x16 slots
8. Form Factor
9. CPU Number
10. PCIe x16 slots
No.1 Benchmark World Records

Taking advantage of the AMD EPYC™ 9004 processors’ compute leadership performance, ASUS servers powered by EPYC™ 9004 achieved the No.1 result for performance – securing a top ranking across SPEC CPU 2017 benchmarks on SPEC.org. The results demonstrate that ASUS leadership with the new AMD EPYC processors, delivering outstanding performance for the server industry.

* ASUS RS720A-E12 AND RS520A-E12 servers are tested the highest scores on SPEC CPU 2017 multiple benchmarks. All results can be verified on November 8, 2023 at SPEC.org

ESC N8A-E12

NVIDIA HGX H100 eight-GPU server with dual AMD EPYC™ 9004 processors, designed for generative AI and HPC

CPU
2 x Socket SP5 (LGA 6096)   AMD EPYC™ 9004 series processors (Up to 400W)

Memory Type
24 x DDR5 8GB/16GB/32GB RDIMM/3DS RDIMM

Drive bays
10 x 2.5″, 2 x M.2

Networking
2 x 10GbE RJ45 port, 1 x Management port

RS720QA-E12-RS8U

Multi-node server with high core counts and memory bandwidth for compute-intensive workloads

CPU
AMD EPYC™ 9004 Series Processor

Chipset
SoC

Memory Type
For node
24 x DDR5 slots
SCR1 up to 4800 RDIMM/ 3DS RDIMM

Drive bays
8

Additional OS Drive
2

Networking
For node
2 x 10GBE LAN
1 x Management port

Custom-focused ASUS Design

ASUS servers are designed with our customers in mind, offering flexibility to enable easy scale-up of configurations to meet increasing data-center workloads.

- CPU-balanced Architecture
  - Offers reliable, optimal CPU performance efficiency between CPUs
  - Extends I/O availability for more computing capability

- Scalable Storage Solutions
  - Unlock SSD RAID performance with SupremeRAID™ Technology, with support for up to 24 NVMe
  - More scalable options in middle and rear bays

- Comprehensive Cooling Solutions
  - New HDD tray and independent airflow tunnel design deliver energy-efficient performance
  - Immersion and direct-to-chip (D2C) liquid-cooling solutions for improved PUE and reduced operational costs

- Multiple GPU and FPGA Support
  - Flexible design to configure PCIe 5.0 x16 slots for specific workloads
  - GPU servers designed with space optimization for liquid-cooling solutions
  - Stand-out AI training and inference performance proved by MLPerf benchmarks
NO.1 BENCHMARK
SPEC.CPU

ASUS holds the most amount of records on the SPEC CPU® 2017 benchmark in single-socket (1P) and dual-socket (2P). These world records are set by servers running across Intel and AMD platforms and workloads ranging from general business infrastructure, software-defined deployment, data analytics, AI, and HPC.

* SPEC is a corporation formed to establish and endorse standardized benchmarks and tools to evaluate performance and energy efficiency of computer systems.

Performance Boost

ASUS servers feature exclusive Performance Boost technology to achieve the best server performance and agility by tuning servers to match the requirements of workloads, letting you gain greater control of your server environment. This technology improves workload throughput by maximizing processor frequency and boost power, ideal for time-sensitive applications such as financial services or data center operations. In the BIOS you can choose from pre-configured server profiles optimized for specific workloads, maximizing overall performance and reducing server-configuration time.

ASUS INNOVATION

Core Optimizer
Maximizes the processor frequency in multi-core operations, avoiding frequency shifting for reduced latency.

Engine Boost
Automatic power acceleration with an innovative voltage design to increase server overall performance.

Workload Presets
Preconfigured BIOS server profiles based on workloads and benchmarks for improved performance and efficiency.

TOP RECORDS
MLPerf

ASUS is focused on creating complete, optimized solutions and strives to cultivate strong industry partnerships to enhance AI developments in diverse fields to push technology to its limits. As an integrated-solutions partner, we deliver leading hardware for the fields of supercomputing and data centers, supported by an extensive AI portal and AI software stack.

* MLCommons is an open engineering consortium, built on a philosophy of open collaboration and accelerate machine learning innovation.

Top records on MLPerf training and inference

ESC N8-E11
ASUS 1st NVIDIA HGX Architecture: The Best Choice for Heavy AI Workloads

ESC8000A-E12
The AMD EPYC™ 9004 dual-processor 4U GPU server for HPC and AI workloads

ESC4000A-E12
This AMD EPYC™ 9004 single-processor powerhouse server with support for four double-slot GPUs for AI-related workloads

ESC4000-E11
Offers a wide array of graphics accelerators, plus support for the NVIDIA NVLink high-speed GPU interconnect, to unleash maximum AI performance

All results can be verified on SPEC.org on March, 2024

1772+

140+

MLPerf Training & Inference
**SERVER SOFTWARE**

**ASUS Control Center**

ASUS Control Center (ACC) is an enterprise-grade centralized management tool for servers and client devices. It is tailored for efficient IT management, including both hardware- and software-inventory management, and the remote dispatch of both software and firmware updates. It also allows for simple remote device configurations and health checks, plus rapid deployment of latest security policies and patches. In short, ACC is a one-stop portal for IT management, and has been embraced by industries and businesses globally to minimize administration and maximize uptime.

**Designed for Enterprise**

- **Modern**
  Graphical dashboard based on responsive HTML5, enabling fast, simple and intuitive navigation from almost any modern device.

- **Remote**
  Remote-management capabilities enhance work flexibility, reducing resources for minimized total cost of ownership (TCO).

- **Centralized**
  Single console-style interfaces allows IT managers to manage and configure devices collectively, from a central location.

--

**ASUS ASMB11-iKVM**

- **Friendly User Interface**
- **Redfish API**
- **Exclusive Auxiliary Tool**
- **KVM Support**
- **Serial and USB Interfaces**

**What does ASMB11-iKVM offer?**

ASMB11-iKVM is optimized firmware-management tool for server and data center operations equipped with IPMI and Redfish Protocols to access and monitor all hardware status, sensor, and update. Out-of-band management significantly reduces redundant IT operations and deployments remotely. Specifically, ASMB11-iKVM connects BIOS, BMC, server information and key parts collectively, offers multiple routes to satisfy customer preferences – making it quick and easy to improve IT operational efficiency.

ASMB11-iKVM is built upon the ASPEED 2600 chipset running on the latest AMI MegaRAC SP-X. The module provides various interfaces to enable out-of-band server management through WebGUI, Intelligent Platform Management Interface (IPMI) and Redfish® API.

ASUS INNOVATION

Additional Package

- **Platform**
  - Networking support
  - HBA and RAID support
  - NVMe support
  - CPLD support
  - PFR support

  - **Standard Protocols**
  - **Authentication and Security**
  - **Server Management**
  - **Redfish Support**
  - **Power Control**
  - **System Thermal and Fan Control**
  - **Security Management**
  - **Hardening**

**Modern**

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Single console-style interfaces allows IT managers to manage and configure devices collectively, from a central location.
LIQUID-COOLING SOLUTIONS
Unparalleled cooling performance for the modern data center

A comprehensive liquid-cooling solution
Deploying high-TDP CPU and GPU servers for demanding workloads poses challenges in building energy-efficient data centers. Liquid-cooling solutions offer optimized space design, reduced power-usage effectiveness (PUE) and lower operating expenditures (OpEx), addressing the need to balance power consumption with green energy initiatives. By working with our partners, we’re able to deliver a total solution — from liquid-cooling modules to ready-to-go servers, and even data center floor plans and suggested infrastructure.

The top four reasons to choose liquid cooling

**Denser Computational Power**
While a server rack with conventional air cooling can manage up to 30 kW of heat dissipation, direct liquid cooling can scale much more. This increase in thermal capacity allows more computational density for servers, upgrading the scale of a data center to accelerate and optimize complex workloads.

**Much-improved PUE**
The thermal efficiency of liquid cooling dramatically improves the PUE of a data center by reducing the demand for CRAC and cooling fans, and liquid coolant is a more efficient medium of heat exchange than air.

**Reduce long-term OpEX**
A data center with liquid cooling is customarily designed for heat recirculation. The hot coolant exiting a server is directed through a heat exchanger system that recycles heat into more energy, further reducing OpEx for utilities. Thanks to this system, the initial cost of most direct liquid-cooling servers can be recovered within the first 12 months of operation, providing potentially significant savings over time.

**A much-quieter environment**
In addition to saving energy through the reduction of CRAC systems and fans, liquid cooling can also reduce fan noise, leading to a healthier work environment for data center personnel. The average acoustic impact of air cooling is between 75 and 95 dBA, whereas liquid cooling averages below 75 dBA. Enterprise, office and military data centers can particularly benefit.

Direct-to-chip cooling solution
ASUS direct-to-chip (D2C) cooling is a quick, simple option that’s based on existing infrastructure. D2C can be deployed quickly, and lower power-usage effectiveness (PUE). ASUS servers can support manifolds and cool plates to enable diverse cooling solutions. Moreover, ASUS servers can support a rear-door heat exchanger that complies with standard rack-server designs, so there’s no need to replace all racks — just the rear door. This lowers the total cost of ownership, and increases data-center utilization ratio.

Immersion-cooling solution
ASUS immersion cooling is another highly-effective solution from ASUS. This technique offers more advantages on PUE and encompasses higher-density servers. However, it also demands more space, and may require retouching of the data-center infrastructure. But immersion cooling can control temperatures more rapidly, efficiently and cost-effectively than traditional methods. For users of supercomputers in particular, immersion cooling is the preferred option.
SUCCESS STORIES

ASUS Establishes National-Level Supercomputing Center, FORERUNNER 1

Project background
The National Applied Research Laboratories (NARLabs) is working on upgrading and building the nation’s most advanced supercomputer center, offering fast computing power, ample storage, and secure networking. It's Taiwan’s largest domestic data and model market, featuring an AI cloud computing platform. This platform delivers real-time and convenient computing services to industries, universities, and research institutes.

The challenge
ASUS won the FORERUNNER 1 project to be responsible for this ambitious project, but starting from scratch presented numerous challenges. FORERUNNER 1 is designed as a replacement for TAIWANIA 1, and is intended to provide the resources needed by all walks of life for supercomputing workloads. These include research topics such as climate prediction, astrophysics simulation, molecular model simulation, engineering design and simulation – and many more applications besides.

Our solution
ASUS managed the construction of the supercomputing infrastructure, which involved data center construction, cabinet installation, testing and onboarding. Rigorous testing ensured optimal performance. Additionally, ASUS meticulously designed the HPC portal architecture. To create a greener FORERUNNER 1 supercomputing system, ASUS refined the liquid-cooling setup, achieving a remarkable PUE of 1.17, surpassing the 1.28 acceptance standard. Despite the hurdles, the project reached completion within a mere four months.

Why ASUS?
• ASUS has comprehensive technological capabilities from hardware servers to software platforms and shows how it is actively exploring and leveraging AI and computing power.
• The dedication and hard work of the ASUS team always response in real-time to provide valuable insights and support and ensure the successful realization of Taiwan’s most advanced supercomputer center.

FORERUNNER 1

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Recommend model
ESCC000-E11
• 2U4N high-density server powered by 5th Gen Intel Xeon Scalable processors
• 8 DIMMs, 2 PCIe 5.0 slots and 6 x storage

RS7200N-E11-RS24U
• NVIDIA Grace Superchip and MVAPICH-GCC technology
• ARM SystemReady-certified

RS723Q-E11-RS24
• ZURU high-density server powered by 5th Gen Intel Xeon Scalable processors
• 16 DIMMs, 2 PCIe 5.0 slots, 8 NVMe, and 1 x Management port per node

Multinational IT Center Construction: Tailored Solutions for Global Retail Group

Project background
Amidst the dynamic landscape of multinational retail, a leading company recognized the imperative to enhance its IT infrastructure to sustain expanding operations and deliver flawless customer service. Following thorough deliberation, the company selected ASUS as its reliable ally for this significant initiative.

The challenge
The client utilized its own robust management software to oversee the operations of its global chain-store systems. Seeking a data center solution, the client aimed for seamless integration with its existing software, avoiding the need for an additional layer of management interface.

Our solution
The choice to go with ASUS over industry leaders such as HPE and Dell stemmed from the adaptability of ASUS, allowing the company to connect the client’s existing management software with ASUS servers through an API. This integration ensured that customer-service logs and other crucial information could be seamlessly shared, enhancing operational efficiency.

Why ASUS?
• ASUS stood out with its flexibility in offering customized solution based on clients requirement.
• The ASU16 team worked closely with the company’s IT department to address design complexities and tailor the solution to their specific requirements. Through collaborative problem-solving, they created a robust and scalable infrastructure that would support the client’s growth for years to come.
• Despite the intricacies involved, the deployment of the new IT infrastructure was completed in an impressively short span of just a few months. The agility ASUS and prompt response to our client's needs played a pivotal role in this speedy implementation.

Recommend model
RS721Q-E11-RS6U
• ZURU high-density server powered by 5th Gen Intel Xeon Scalable processors
• 8 DIMMs, 2 PCIe 5.0 slots, 8 NVMe, and 1 x management port per node
### Arm Server

<table>
<thead>
<tr>
<th>Sample</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESC NM1-E1</td>
<td>2x AMD EPYC 9004 Series Processors Up to 24 PCIe Gen5 slots +1 x internal RAID slot</td>
</tr>
<tr>
<td>ESC NM2-E1</td>
<td>2x NVIDIA GH200 Grace Hopper 144GB co-packaged</td>
</tr>
<tr>
<td>R520QN-E11-R524U</td>
<td>2x AMD EPYC 9004 Series Processors Up to 24 PCIe Gen5 slots +1 x internal RAID slot</td>
</tr>
<tr>
<td>R520A-E12-R524U</td>
<td>2x AMD EPYC 9004 Series Processors Up to 24 PCIe Gen5 slots +1 x internal RAID slot</td>
</tr>
</tbody>
</table>

**Processors**
- AMD EPYC 9004 Series
- AMD EPYC 9004 Series
- AMD EPYC 9004 Series
- AMD EPYC 9004 Series

**Memory**
- 2x8GB slots (RDIMM 4400/5400 RDIMM/ LRDIMM)
- 2x8GB slots (RDIMM 4400/5400 RDIMM/ LRDIMM)
- 2x8GB slots (RDIMM 4400/5400 RDIMM/ LRDIMM)
- 2x8GB slots (RDIMM 4400/5400 RDIMM/ LRDIMM)

**Chipset**
- AMD ASX11-iKVM (on-board)
- AMD ASX11-iKVM (on-board)
- AMD ASX11-iKVM (on-board)
- AMD ASX11-iKVM (on-board)

**VGA**
- 80 PLUS Platinum Power Supply
- 80 PLUS Titanium Power Supply
- 80 PLUS Platinum Power Supply
- 80 PLUS Platinum Power Supply

**Storage Bays**
- 2x M.2 (Up to 22110, NVMe only)
- 2x M.2 (Up to 22110, NVMe only)
- 2x M.2 (Up to 22110, NVMe only)
- 2x M.2 (Up to 22110, NVMe only)

**Expansion Slots**
- 1x PCIe Gen5 x16 slots (LPHL) + 1 x OCP3.0
- 1x PCIe Gen5 x16 slots (LPHL) + 1 x OCP3.0
- 1x PCIe Gen5 x16 slots (LPHL) + 1 x OCP3.0
- 1x PCIe Gen5 x16 slots (LPHL) + 1 x OCP3.0

**Networking**
- 2x 1Gbe LAN port + 1 x Management Port
- 2x 1Gbe LAN port + 1 x Management Port
- 2x 1Gbe LAN port + 1 x Management Port
- 2x 1Gbe LAN port + 1 x Management Port

**Front I/O ports**
- 1x Power Button (w/ LED)
- 1x Power Button (w/ LED)
- 1x Power Button (w/ LED)
- 1x Power Button (w/ LED)

**Rear I/O ports**
- 1x VGA port
- 1x VGA port
- 1x VGA port
- 1x VGA port

**Security Options**
- Optional TRM module
- Optional TRM module
- Optional TRM module
- Optional TRM module

**Management Solution**
- AMD Control Center
- AMD Control Center
- AMD Control Center
- AMD Control Center

**Power Supply**
- 1+1 Redundant 600W (1U)
- 1+1 Redundant 600W (1U)
- 1+1 Redundant 600W (1U)
- 1+1 Redundant 600W (1U)

### Rack Server

<table>
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<th>Sample</th>
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<tr>
<td>R520A-E12-R524U</td>
<td>2x AMD EPYC 9004 Series Processors Up to 24 PCIe Gen5 slots +1 x internal RAID slot</td>
</tr>
<tr>
<td>R520A-E12-R512</td>
<td>2x AMD EPYC 9004 Series Processors Up to 24 PCIe Gen5 slots +1 x internal RAID slot</td>
</tr>
<tr>
<td>R5700A-E12-R512U</td>
<td>2x AMD EPYC 9004 Series Processors Up to 24 PCIe Gen5 slots +1 x internal RAID slot</td>
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<tr>
<td>R5700A-E12-R54U</td>
<td>2x AMD EPYC 9004 Series Processors Up to 24 PCIe Gen5 slots +1 x internal RAID slot</td>
</tr>
</tbody>
</table>

**Processors**
- AMD EPYC 9004 Series
- AMD EPYC 9004 Series
- AMD EPYC 9004 Series
- AMD EPYC 9004 Series

**Memory**
- 2x4DM80 slots (RDIMM 4400/5400 RDIMM/ LRDIMM)
- 2x4DM80 slots (RDIMM 4400/5400 RDIMM/ LRDIMM)
- 2x4DM80 slots (RDIMM 4400/5400 RDIMM/ LRDIMM)
- 2x4DM80 slots (RDIMM 4400/5400 RDIMM/ LRDIMM)

**Chipset**
- AMD ASX11-iKVM (on-board)
- AMD ASX11-iKVM (on-board)
- AMD ASX11-iKVM (on-board)
- AMD ASX11-iKVM (on-board)

**VGA**
- 80 PLUS Platinum Power Supply
- 80 PLUS Titanium Power Supply
- 80 PLUS Platinum Power Supply
- 80 PLUS Platinum Power Supply

**Storage Bays**
- 2x M.2 (Up to 22110, NVMe only)
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- 1x PCIe Gen5 x16 slots (LPHL) + 1 x OCP3.0

**Networking**
- 4x 1Gbe or 2x 10Gbe LAN port + 1x Management Port
- 4x 1Gbe or 2x 10Gbe LAN port + 1x Management Port
- 4x 1Gbe or 2x 10Gbe LAN port + 1x Management Port
- 4x 1Gbe or 2x 10Gbe LAN port + 1x Management Port

**Front I/O ports**
- 2x USB 3.2 Gen1 ports + 1x Power Button
- 2x USB 3.2 Gen1 ports + 1x Power Button
- 2x USB 3.2 Gen1 ports + 1x Power Button
- 2x USB 3.2 Gen1 ports + 1x Power Button

**Rear I/O ports**
- 1x 1Gbe port + 1x Management Port
- 1x 1Gbe port + 1x Management Port
- 1x 1Gbe port + 1x Management Port
- 1x 1Gbe port + 1x Management Port

**Security Options**
- Optional TRM module
- Optional TRM module
- Optional TRM module
- Optional TRM module

**Management Solution**
- AMD Control Center
- AMD Control Center
- AMD Control Center
- AMD Control Center

**Power Supply**
- 1+1 Redundant 600W (1U)
- 1+1 Redundant 600W (1U)
- 1+1 Redundant 600W (1U)
- 1+1 Redundant 600W (1U)
## SPECIFICATIONS

### Rack Server

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor</strong></td>
<td>1 x Socket SP3 (SGA-6600) AMD EPYC™ 9004 Series Processors (Up to 400W)</td>
<td>1 x Socket SP3 (SGA-6600) AMD EPYC™ 9004 Series Processors (Up to 400W)</td>
<td>1 x Socket SP3 (SGA-6600) AMD EPYC™ 9004 Series Processors (Up to 400W)</td>
<td>1 x Socket SP3 (SGA-6600) AMD EPYC™ 9004 Series Processors (Up to 400W)</td>
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<tr>
<td><strong>Chipset</strong></td>
<td>System on Chip (SoC)</td>
<td>System on Chip (SoC)</td>
<td>System on Chip (SoC)</td>
<td>System on Chip (SoC)</td>
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<td><strong>Memory</strong></td>
<td>24 x DIMM slots</td>
<td>24 x DIMM slots</td>
<td>24 x DIMM slots</td>
<td>24 x DIMM slots</td>
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<tr>
<td></td>
<td>DDR5 (4800/5200): 2x2/2x4</td>
<td>DDR5 (4800/5200): 2x2/2x4</td>
<td>DDR5 (4800/5200): 2x2/2x4</td>
<td>DDR5 (4800/5200): 2x2/2x4</td>
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<tr>
<td></td>
<td>16x2</td>
<td>16x2</td>
<td>16x2</td>
<td>16x2</td>
</tr>
<tr>
<td><strong>VGA</strong></td>
<td>Optional ASUS E2600-4HMB</td>
<td>Optional ASUS E2600-4HMB</td>
<td>Optional ASUS E2600-4HMB</td>
<td>Optional ASUS E2600-4HMB</td>
</tr>
<tr>
<td><strong>Graphic</strong></td>
<td>4 x single-width GPU (PHL) or 2 x double-width GPU (PHL)</td>
<td>4 x single-width GPU (PHL) or 2 x double-width GPU (PHL)</td>
<td>4 x single-width GPU (PHL) or 2 x double-width GPU (PHL)</td>
<td>4 x single-width GPU (PHL) or 2 x double-width GPU (PHL)</td>
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<tr>
<td><strong>Expansion Slots</strong></td>
<td>Up to 2 single-slot or 2 double-slot GPU cards</td>
<td>Up to 2 single-slot or 2 double-slot GPU cards</td>
<td>Up to 2 single-slot or 2 double-slot GPU cards</td>
<td>Up to 2 single-slot or 2 double-slot GPU cards</td>
</tr>
<tr>
<td><strong>Front I/O ports</strong></td>
<td>1 x Power Button</td>
<td>1 x Management port</td>
<td>2 x USB 3.2 Gen1 ports</td>
<td>2 x USB 3.2 Gen1 ports</td>
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<tr>
<td><strong>Rear I/O ports</strong></td>
<td>2 x USB 3.2 Gen1 ports</td>
<td>2 x USB 3.2 Gen1 ports</td>
<td>2 x USB 3.2 Gen1 ports</td>
<td>2 x USB 3.2 Gen1 ports</td>
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<td><strong>Security Options</strong></td>
<td>Optional TPM module</td>
<td>Optional TPM module</td>
<td>Optional TPM module</td>
<td>Optional TPM module</td>
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<tr>
<td><strong>Management Solution</strong></td>
<td>ASUS Control Center</td>
<td>ASUS Control Center</td>
<td>ASUS Control Center</td>
<td>ASUS Control Center</td>
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<tr>
<td><strong>Dimension</strong></td>
<td>844mm x 449mm x 88.1mm (2U)</td>
<td>844mm x 449mm x 88.1mm (2U)</td>
<td>844mm x 449mm x 88.1mm (2U)</td>
<td>844mm x 449mm x 88.1mm (2U)</td>
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<tr>
<td><strong>Power Supply</strong></td>
<td>N/A</td>
<td>N/A</td>
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### Sample

<table>
<thead>
<tr>
<th>Sample</th>
<th>RS720-E11-RS24U</th>
<th>RS720-E11-RS12U</th>
<th>RS700-E11-RS12U</th>
<th>RS700-E11-RS4U</th>
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<tbody>
<tr>
<td><strong>Processor</strong></td>
<td>2 x Socket E (SGA477) 4th Gen Intel® Xeon® Scalable processors</td>
<td>2 x Socket E (SGA477) 4th Gen Intel® Xeon® Scalable processors</td>
<td>2 x Socket E (SGA477) 4th Gen Intel® Xeon® Scalable processors</td>
<td>2 x Socket E (GA477) 4th Gen Intel® Xeon® Scalable processors</td>
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<tr>
<td><strong>Chipset</strong></td>
<td>Intel® C424</td>
<td>Intel® C424</td>
<td>Intel® C424</td>
<td>Intel® C424</td>
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<td><strong>Memory</strong></td>
<td>32 x DIMM slots</td>
<td>32 x DIMM slots</td>
<td>32 x DIMM slots</td>
<td>32 x DIMM slots</td>
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<tr>
<td></td>
<td>DDR5 (4800/5600/6400 MHz)</td>
<td>DDR5 (4800/5600/6400 MHz)</td>
<td>DDR5 (4800/5600/6400 MHz)</td>
<td>DDR5 (4800/5600/6400 MHz)</td>
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<tr>
<td></td>
<td>16x2</td>
<td>16x2</td>
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<tr>
<td><strong>VGA</strong></td>
<td>Optional ASUS E2600-4HMB</td>
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<td>Optional ASUS E2600-4HMB</td>
</tr>
<tr>
<td><strong>Graphic</strong></td>
<td>Up to 4 single-width GPUs or 2 double-width GPUs</td>
<td>Up to 4 single-width GPUs or 2 double-width GPUs</td>
<td>Up to 4 single-width GPUs or 2 double-width GPUs</td>
<td>Up to 4 single-width GPUs or 2 double-width GPUs</td>
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<tr>
<td><strong>Expansion Slots</strong></td>
<td>Up to 8 slots</td>
<td>Up to 8 slots</td>
<td>Up to 8 slots</td>
<td>Up to 8 slots</td>
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<tr>
<td></td>
<td>PCI-E x16 Gen5 or 2xPCI-E x8 Gen5</td>
<td>PCI-E x16 Gen5 or 2xPCI-E x8 Gen5</td>
<td>PCI-E x16 Gen5 or 2xPCI-E x8 Gen5</td>
<td>PCI-E x16 Gen5 or 2xPCI-E x8 Gen5</td>
</tr>
<tr>
<td><strong>Front I/O ports</strong></td>
<td>4 x 1GbE or 2 x 10GbE LAN ports</td>
<td>4 x 1GbE or 2 x 10GbE LAN ports</td>
<td>4 x 1GbE or 2 x 10GbE LAN ports</td>
<td>4 x 1GbE or 2 x 10GbE LAN ports</td>
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<tr>
<td><strong>Rear I/O ports</strong></td>
<td>1 x Power Button</td>
<td>1 x Management port</td>
<td>2 x USB 3.2 Gen1 ports</td>
<td>2 x USB 3.2 Gen1 ports</td>
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<tr>
<td><strong>Security Options</strong></td>
<td>Optional TPM module</td>
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<tr>
<td><strong>Management Solution</strong></td>
<td>ASUS Control Center</td>
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**SPECIFICATIONS**

### Rack Server

**Processor**
- 1 x Socket (LGA 1700) Intel® Corei3-12400 (Up to 85W)

**Chipset**
- Intel® C62 Series

**Memory**
- 4 x DIMM slots DDR4 4800/4900/5000 ECC/Non-ECC (UDIMM)
- Maximum 128GB

**VGA**
- Aspeed AST2600 64MB

**Graphic**
- N/A

**Expansion Slots**
- Up to 2 x PCIe (x16 gen 5)
- Up to 2 x PCIe (x16 gen 4)
- Up to 2 x PCIe (x8 gen 3)

**Storage Bays**
- 10 x 2.5" Hot Swap drive bays (backplane supports up to 8 x NVMe/SATA/SAS)
- 1 x M.2 support (Gen 3 x4 link) PCIe switch directly

**Networking**
- 1 x Management Port

**Rear I/O ports**
- 1 x VGA port
- 2 x USB 3.2 Gen 2 ports

**Security Options**
- N/A

**Management Solution**
- ASUS Control Center

**Power Supply**
- 1 x Redundant 450W/80 PLUS PLATINUM Power Supply

### GPU Server

**Processor**
- 1 x Socket (LGA 4967) 4th Gen Intel® Xeon® Scalable Family

**Chipset**
- Intel® C611

**Memory**
- 24 x DIMM slots DDR4 4800/4900/5000 ECC/Non-ECC (UDIMM)
- Maximum 128GB

**VGA**
- Aspeed AST2600 64MB

**Graphic**
- N/A

**Expansion Slots**
- Up to 3 x PCIe (x16 gen 5)
- Up to 3 x PCIe (x16 gen 4)
- Up to 2 x PCIe (x16 gen 3)

**Storage Bays**
- 10 x 2.5" Hot Swap drive bays (backplane supports up to 8 x NVMe/SATA/SAS)
- 1 x M.2 support (Gen 3 x4 link) PCIe switch directly

**Networking**
- 1 x Management Port

**Rear I/O ports**
- 1 x VGA port
- 4 x USB 3.2 Gen 2 ports

**Security Options**
- N/A

**Management Solution**
- ASUS Control Center

**Power Supply**
- 1 x Redundant 3000W 80 PLUS Titanium Power Supply
## SPECIFICATIONS

### GPU Server

<table>
<thead>
<tr>
<th>Sample</th>
<th>ESC8000-E11P</th>
<th>ESC4000-E11</th>
<th>RS720QA-E12-RS8U</th>
<th>RS720Q-E11-RS8U</th>
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</thead>
<tbody>
<tr>
<td><strong>Processor</strong></td>
<td>2 x Socket E-2487</td>
<td>4 x Intel® Xeon® Scalable Family</td>
<td>2 x Socket E-4277</td>
<td>4 x Intel® Xeon® Scalable Family</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>Intel® C241</td>
<td>Intel® C241</td>
<td>Intel® C241</td>
<td>Intel® C241</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>32 x DDR4 slots</td>
<td>64 x DDR4 slots</td>
<td>24 x DDR4 slots</td>
<td>16 x DDR4 slots</td>
</tr>
<tr>
<td><strong>VGA</strong></td>
<td>Asus EVA 1200</td>
<td>Asus EVA 1200</td>
<td>Asus EVA 1200</td>
<td>Asus EVA 1200</td>
</tr>
<tr>
<td><strong>Graphic</strong></td>
<td>Up to 8 double-slot GPU cards</td>
<td>Up to 8 double-slot GPU cards</td>
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<td>N/A</td>
</tr>
<tr>
<td><strong>Expansion Slots</strong></td>
<td>Front: 4 x PCIe 8/16 slot (Gen 4, FHHL)</td>
<td>Rear: 4 x PCIe 8/16 slot (Gen 4, FHHL)</td>
<td>Rear: 2 x PCIe x16 slot (Gen 3, FHHL)</td>
<td>Rear: 6 x PCIe x16 slot (Gen 4, FHHL)</td>
</tr>
<tr>
<td><strong>Storage Bays</strong></td>
<td>1 x 5.25” Front Hot-swap drive bays</td>
<td>2 x 3.5&quot; Front Hot-swap drive bays</td>
<td>2 x 2.5&quot; Front Hot-swap drive bays</td>
<td>2 x 2.5&quot; Front Hot-swap drive bays</td>
</tr>
<tr>
<td><strong>Networking</strong></td>
<td>1 x RJ-45 Console port</td>
<td>2 x RJ-45 LAN port</td>
<td>1 x RJ-45 LAN port</td>
<td>1 x RJ-45 LAN port</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>1+1 Redundant 3000W PSU</td>
<td>1+1 Redundant 6500W PSU</td>
<td>1+1 Redundant 6500W PSU</td>
<td>1+1 Redundant 3000W PSU</td>
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### High Density Server

<table>
<thead>
<tr>
<th>Sample</th>
<th>RS720E-Q11-RS24</th>
<th>EG520-E11-RS6-R</th>
<th>EG520-E11-RS6-F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor</strong></td>
<td>2 x Socket E-4277</td>
<td>1 Socket E-4277</td>
<td>1 Socket E-4277</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>Intel® C241</td>
<td>Intel® C241</td>
<td>Intel® C241</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>32 x DDR4 slots</td>
<td>16 x DDR4 slots</td>
<td>8 x DDR4 slots</td>
</tr>
<tr>
<td><strong>VGA</strong></td>
<td>Asus EVA 1200</td>
<td>Asus EVA 1200</td>
<td>Asus EVA 1200</td>
</tr>
<tr>
<td><strong>Graphic</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Expansion Slots</strong></td>
<td>1 x mini Display port</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Storage Bays</strong></td>
<td>2 x 2.5&quot; Front Hot-swap drive bays</td>
<td>2 x 3.5&quot; Front Hot-swap drive bays</td>
<td>2 x 3.5&quot; Front Hot-swap drive bays</td>
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<tr>
<td><strong>Networking</strong></td>
<td>1 x 1GbE LAN port</td>
<td>2 x 1GbE LAN ports</td>
<td>2 x 1GbE LAN ports</td>
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<tr>
<td><strong>Power Supply</strong></td>
<td>1+1 Redundant 3000W PSU</td>
<td>1+1 Redundant 3000W PSU</td>
<td>1+1 Redundant 3000W PSU</td>
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### Edge Server

<table>
<thead>
<tr>
<th>Sample</th>
<th>RS720E-Q11-RS24</th>
<th>EG520-E11-RS6-R</th>
<th>EG520-E11-RS6-F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor</strong></td>
<td>2 x Socket E-4277</td>
<td>1 Socket E-4277</td>
<td>1 Socket E-4277</td>
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<tr>
<td><strong>Chipset</strong></td>
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<td>Intel® C241</td>
<td>Intel® C241</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>32 x DDR4 slots</td>
<td>16 x DDR4 slots</td>
<td>8 x DDR4 slots</td>
</tr>
<tr>
<td><strong>VGA</strong></td>
<td>Asus EVA 1200</td>
<td>Asus EVA 1200</td>
<td>Asus EVA 1200</td>
</tr>
<tr>
<td><strong>Graphic</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Expansion Slots</strong></td>
<td>1 x mini Display port</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Storage Bays</strong></td>
<td>2 x 2.5&quot; Front Hot-swap drive bays</td>
<td>2 x 3.5&quot; Front Hot-swap drive bays</td>
<td>2 x 3.5&quot; Front Hot-swap drive bays</td>
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<tr>
<td><strong>Networking</strong></td>
<td>1 x 1GbE LAN port</td>
<td>2 x 1GbE LAN ports</td>
<td>2 x 1GbE LAN ports</td>
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<tr>
<td><strong>Power Supply</strong></td>
<td>1+1 Redundant 3000W PSU</td>
<td>1+1 Redundant 3000W PSU</td>
<td>1+1 Redundant 3000W PSU</td>
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**SPECIFICATIONS**

### Processor
- Intel® Xeon® 64-bit 4-core
- Up to 2 single-slot GPU cards
- Up to 2 single-slot GPU cards
- Aspeed AST2600 64MB

### Memory
- DDR4 up to 3200 ECC RDIMM
- Maximum 256GB

### VGA
- Aspeed AST2600 64MB
- Optional PFR module

### Graphics
- 2 x USB 3.2 Gen1 ports
- Optional TPM module

### Storage
- Internal Drive Interface: SAS 12Gb/s
- Maximum Drive Bays with Expansion Units: 16,773 TB (calculate 36.77TB)

### Expansion Slots
- 2 x PCIe Gen4 slots
- 2 x PCIe GS x16 (FHL)

### Storage Bays
- 2x E1.S + 2x 2.5'' Int. SATA for 650W/
  - (Up to 205W or 225W EE SKUs)
- 2x E1.S + 2x 2.5'' Int. SATA for 650W/
  - (Up to 350W)

### Network:
- Up to 2 PCIe Gen5 slots
- Up to 2 single-slot GPU cards
- Up to 2 single-slot GPU cards

### Connectivity Port:
- Optional (per controller):
  - 4 x 10GbE SFP+ LAN Port
  - 2 x 32Gb SFP+/Fibre Channel
  - 2 x 32Gb SFP+/Fibre Channel

### Expansions and External Port:
- 2 x 10GbE LAN port
- 1x Management port (onboard per controller)
- 1x Service Port (UPS)
- 1x Service Port (UPS)

### Power Supply
- 1+1 Redundant 650W 50.5MM SLIM Platinum Power Supply
- 1+1 Redundant 650W 50.5MM SLIM Platinum Power Supply

### Dimensions:
- 870mm x 438.5mm x 515mm (2U)
- 438.5mm x 438.5mm x 399mm (1U)

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Achieved 1,772+ world-record benchmarks with SPEC CPU® 2017, and still growing

World's most power-efficient servers on SPECpower

2P server on SPECjbb-Composite and SPECjbb-Multi-JVM performance

Ranked Top 20 on the Top 500 list of the world's most powerful supercomputers and Top 10 on the Green500 list in 2018 by supporting TAIWANIA 2

Ranked No.1 on the Green500 list of energy-efficient supercomputers in 2014I thin