MEGWARE, a leading supercomputing specialist, is helping to reshape the HPC industry in Germany and across Europe. For more than 25 years, the company has developed innovative products, including chassis, power distribution units (PDUs), direct liquid cooling, and management software for clustering applications. Their focus on progressive project design, breadth of in-house engineering capabilities, and long-standing expertise is responsible for a large number of highly successful hardware and software deployments. Many of these solutions are on the TOP500 List of the most powerful HPC systems in the world.

MEGWARE integrates Intel® Server Products for HPC Compute Blocks into their HPC solutions, taking advantage of the high-quality, cost-effective, semi-integrated server building blocks based on Intel's most advanced technologies. With Intel Server Products for HPC Compute Blocks, channel resellers such as MEGWARE can accelerate delivery of customized and highly optimized HPC solutions to their customers. These solutions meet the most demanding computing tasks in science and research, such as calculating the human genome, conducting research in atomic physics, and simulating crash tests without the costly manufacture of prototypes.

MEGWARE clusters are enabling fast performance for demanding HPC applications.

- Optimized, homogeneous, turnkey parallel computer systems customized to meet specific customer requirements
- Based on Intel® Server Products to enable fast time-to-market with low TCO, while streamlining system integration, validation, compatibility, certification, and support
MEGWARE Cluster Technologies Case Study

Improving Cluster Manageability
MEGWARE’s innovative ClustWare* appliance is a management, monitoring, and administration solution for compute clusters. The supervision of all systems and performance parameters is critical for detecting any faults in the hardware components. The management system consists of hardware and software modules, as well as a web-based administrative user interface, and provides centralized control and administration of both software and hardware.

ClustSafe* is a power-distribution unit developed by MEGWARE for use in universal applications. The PDU sequentially connects cluster nodes with the power supply system after power failure or when restarting the system. ClustSafe consists of a central control unit per rack and up to eight ClustSafe modules, each with space to connect 12 compute nodes. It can expand to support up to 96 power connections.

Supporting Advanced Research
A range of demanding workloads is taking advantage of MEGWARE’s cluster capabilities.

A deployment for the Ernst-Moritz-Arndt-Universität of Greifswald includes an efficient, direct liquid cooling SlideSX-LC server running on an Intel Server Board S2600KP and Intel Xeon processor E5-2623 v3. This cluster will be the central workhorse for HPC for the university. Major applications on the system will be used by physics, geosciences, and genome sequencing.

The universities of Heidelberg and Mannheim purchased a new high-performance computer, the bwForCluster MLS&WISO* (Molecular Life Science & Business and Social Sciences). The cluster is part of the state of Baden-Württemberg’s high performance computing (HPC)
strategy. The high performance compute clusters are designated for four university locations to support core research focus areas. The system includes both production and development environments. Scientists will use methods from computer science, computational biology, and statistics for research on cancer development, diagnosis, and therapy. Their goal is to translate bioinformatics insights into clinical practice to improve cancer care.

The MEGWARE system architecture uses compute nodes powered by Intel Server Products for HPC Compute Blocks with targeted, custom specifications. An InfiniBand* network communicates between the compute nodes and other elements of the operational infrastructure to further speed application performance. The MEGWARE cluster consists of more than 600 nodes and has processing capacity ranges up to 241.1 TFlop/s. The Intel Xeon processor E5-2600 v3 family provides approximately 10,000 cores for the data centers and is the basis for the high performance compute nodes. The majority of the nodes are fitted with the Intel Xeon processor E5-2630 v3, which comes with eight physical cores and a base clock speed of 2.4 GHz, as well as support for a 1866 MHz memory clock. The high-quality features of the server chassis provide ideal conditions for stable system operations.

INTEL SERVER BOARDS

Intel® Server Board S2600KP

Best Fit for HPC and Big Data Workloads

Designed for high performance and density in a small form factor (SFF) board, and optimized for memory performance (1DPC), this server board is a two-socket, half-width, eight-DIMM board for a 2U four-node chassis. Customizable as a 2U, four-node system, it features easy serviceability and high availability with hot-swappable compute modules, 2.5-inch or 3.5-inch drive bays, and redundant power supplies. It brings excellent I/O flexibility via support for Intel® I/O Expansion Modules and an onboard dedicated management port.

The board supports the Intel Xeon processor E5-2600 v3 family and is ideal for environments where highly demanding distributed processing and intensive application workloads rely on maximum compute density and performance.

Key Features

- Supports two Intel Xeon processors E5-2600 v3, 145 W maximum
- Eight memory sockets support LR/R-DIMMs, up to 512 GB maximum memory per node
- Custom half-width form factor (6.4" wide x 17.7" long), up to four nodes per 2U
- Three risers with 64 I/O lanes available per board
- Board models with or without integrated FDR InfiniBand
- Dual-integrated 1GbE network controller and an integrated management port
- All nodes, power supplies, and storage are hot-swappable
MEGWARE Cluster Technologies Case Study

Maximum Capacity Meets More Memory
This high-density performance server board is designed for data analytics, storage, and cloud configurations requiring large memory and maximum I/O capacity. It provides an ideal solution for highly demanding distributed processing, intensive application workloads, and high performance-per-dollar solutions requiring maximum compute density and performance to get results.

The Intel® Server Board S2600TP features 16 DIMMs per board, up to four riser slots exposing all 80 lanes of PCI Gen 3 available in the chipset, with optional FDR InfiniBand and Intel® Remote Management Module support.

Key Features
- Supports two Intel® Xeon processors E5-2600 v3, 145 W maximum
- 16 memory sockets support LR/R-DIMMs, up to 1024 GB maximum memory per node
- High-density, small, custom, half-width form factor, 6.8” wide x 18.9” long
- Four risers with 80 I/O lanes available per board
- Board models available with or without integrated FDR InfiniBand
- All nodes, power supplies, and storage are hot-swappable
- Dual-integrated 1GbE network controller and an integrated management port

Conclusion
MEGWARE’s primary aim is to give its customers innovative, workable, and flawless solutions. This demands fast, energy-efficient processors. The latest Intel Server Products for HPC Compute Blocks meet these requirements: they are flexible, easy to deliver and assemble, have more uptime, and need less maintenance time. This allows MEGWARE to focus more engineering resources on creating innovative solutions that will meet the complex and unique needs of their customers.

MEGWARE’s end customers are benefitting from sophisticated, customized HPC server solutions that integrate Intel Server Products for HPC Compute Blocks to meet their unique business needs. MEGWARE’s commitment to innovation makes it a natural partner for Intel’s future-forward roadmap and standardized, interoperable cluster and HPC technologies. Ongoing research based on supercomputing is just one demonstration of the powerful impact these systems can have for scientific research and industries, from healthcare to finance.
INTEL® CLUSTER READY

Intel® Cluster Ready makes it easier to gain the performance advantages of HPC clusters. Developed with hardware and software vendors, Intel Cluster Ready lets you match your HPC applications to today’s leading platforms and components. Preconfigured cluster solutions are delivered ready to run, so you can unleash more parallel performance faster. Intel Server Products for HPC Compute Blocks are optimized and certified for Intel Cluster Ready.

Match certified systems with registered applications and enjoy the freedom to focus on purchasing the configuration that best fits your application workload—without worrying if components will work together. Intel Cluster Ready solutions come with the Intel® Cluster Checker tool, to help you validate that the cluster remains within certification over time and troubleshoot any problems that occur. The result: greater productivity and higher return on your HPC investment.

clusterready.intel.com

Discover what Intel® Server Products for HPC Compute Blocks can do for your workloads, solutions, and innovation.

intelserveredge.com/HPC

Learn more about MEGWARE.

megware.com