PARPRO

Partners in Production and Design

Case Study

HPC DESIGN THAT MATCHES THE SPEED OF DATA STORAGE INNOVATION

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Established HPC Configuration Knowledge, Project Development Processes Help Take Storage System Capabilities to the Next Level

PARPRO expertise makes simple work of the most complex designs

PROBLEM:

- Proven design team capable of handling an extremely complex and cutting-edge high-performance computing design for large industrial data storage blade solution.
- Overcome first design team's communication, technical support and project organizational issues that jeopardized the integration of new system capabilities.

SOLUTION:

- PARPRO engineers revitalized project with proven ODM processes managed by knowledgeable teams that implemented the best Design for Manufacturability (DFM) techniques.
- Breakthrough HPEC design features 28 layers, more than 14,000 components and 51,000 connections – improved performance over previous generation in the same small footprint.

RESULTS:

- Met revolutionary performance metrics with virtually no latency for exceptionally-fast data access to fulfill massive data growth demands.
- With successful prototype tests, leading storage customer can meet customer commitments, budget and time-to-market goals.

PROBLEM:

More complex than the average HPC design, the project required proven knowledge of a far-reaching range of competencies including multi-core processor architectures, high-speed interfaces, seamless interconnect functionality supported by extensive and flexible I/O. Adding complexity and integration challenges, the design needed to be able to accommodate a considerable increase in memory channels over the previous generation platform. This had to be accomplished without increasing both the layer count and the cost of the board. It required computing engineering expertise to maximize the power of the latest processor architectures to work seamlessly with the customer's software allowing them to offer a significant leap forward in performance of any large-scale storage solution. Unprecedented support for more than 70 SAS drives and almost 50 PCIe Gen 3 NVMe drives had to be part of the HPC solution.

SOLUTION:

Using the company's vast experience, engineering talent, and knowledge of high-performance platforms, PARPRO got the project back on track. Armed with proven project organizational procedures and superior technical support, the team expertly managed the development process. Customized to the customer's strict requirements, PARPRO's HPC solution offers the next-generation features needed to handle enormous amounts of data, faster with the lowest latency by harnessing the power of today's advanced technologies and balancing them with the customer's leading storage capabilities.

The high-density computing platform delivered features supercharged computing technologies including the Intel® Dual Xeon® server-class processor. Providing a totally new and unique design based on a sophisticated new processor architecture allows this new large data storage blade to take advantage of operational efficiencies provided by isolated workloads configured to dynamically share common resources. For instance, it supports up to four tasks or software threads and can run both 64-bit and 32-bit applications allowing developers to powerfully consolidate numerous operating systems, applications, and workloads onto a single platform.

The PARPRO HPC provides the high-performance network connectivity with intelligent caching and full bandwidth infrastructure for multiple 65-lane, 17 port PCIe Gen3 switches capable of moving data at ultra-high speeds

Using the advanced Intel OPA fabric enabled the PARPRO HPC to support the extreme workload balancing this design required via a variety of routing methods, including defining alternate routes that disperse traffic flows for redundancy while maintaining performance. In addition, because many connected devices and systems today support native PCIe, PARPRO's HPEC can immediately use existing infrastructure further reducing latency, power and associated costs for discrete cards.

Also, this kind of intense workload design required optimizing thermal management for trusted reliability. The design incorporates an air guide and multiple active heat sinks expertly tested and validated. PARPRO used state-of-the-art thermal modeling tools and techniques to accurately measure temperature, airflow and heat transfer in components, boards and throughout the entire system.

BENEFITS:

The successful completion of the HPEC design presents mutual opportunities to open doors for PARPRO and their customer. For the customer, data intensive computing is what is propelling large storage system evolution offering the ability to leverage and manage huge data growth.

Innovative HPC design help to strategically satisfy pent-up demand for data storage with massive parallel computing capabilities.
Space-constrained data centers or those needing more cost-conscious additional high-performance capacity benefit from extremely dense storage platform.

The customer gains a competitive edge in offering an industry-leading storage solution that truly can handle immense amounts of data and the ability to analyze it fast. Through PARPRO's purpose-built design, the customer received a scalable solution that can be leveraged across its entire portfolio of high-capacity storage appliances.

"At PARPRO, we have earned our leadership position by solving complex design challenges while cost-effectively minimizing margin stacks throughout the value chain," said Thomas Sparrvik, CEO, PARPRO. "During our meetings with the storage customer, they commented on how they continue to be impressed by our extensive software, processor architecture, form factor and power envelope know-how that enabled them to meet the project's board layout limitations while satisfying their prototype timetable and cost goals."

This project also holds additional opportunities for PARPRO to extend its relationship with the customer. They are interested in the company's complete end-to-end ODM services to ensure manufacturing and after-market programs are managed and accomplished just as successfully.

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