



FAIRFIELD INDUSTRIES

Fairfield Industries, headquartered in Sugar Land, Texas, is known worldwide for development and use of advanced technology for seismic data acquisition and data processing. They provide the oil and gas industry with risk-reducing solutions to solve challenging exploration and production problems. As part of their geophysical services offering, Fairfield produces both 2D and 3D seismic images based on compute-intensive, scientific calculations derived from field data.

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Richard Rowbatham, System Administrator, Fairfield Industries

In keeping with their agenda to deliver the highest quality geophysical services to their customers, on time and within budget, Fairfield was one of the early adopters of high-performance, parallel computing. They built one of the industry's first production-grade, Linux clusters for seismic data processing, designing and building their cluster from scratch. Fairfield called out the specifications, computing platforms, and microprocessors needed to do the job. This approach gave the company a business-competitive edge over other seismic imaging vendors because it allowed Fairfield to fine-tune processing operations to achieve the highest I/O performance, and tailor algorithms and software applications specifically to the requirements of its oil and gas customers.

The early Fairfield Linux cluster relied on small computer system interface (SCSI)-based, RAID systems that were attached to workstations with NFS-supported storage. According to Richard Rowbatham, Systems Administrator at Fairfield, "The storage was the size of a washing machine and only had 500 Gigabytes of capacity. Approximately 15 to 16 five and a quarter inch disk drives were used in each RAID system to read and write data. These data were then manipulated with custom algorithms and passed on to oil and gas customers to help them pinpoint oil reserves with accuracy."

But as the technology evolved, the SCSI disks reached the end of their life-cycle and Fairfield had no vendor support. "We had to move away from that system and on to newer technologies to keep abreast of client backlog and to remain competitive," said Rowbatham.

The Challenge

In building a custom HPC production environment, Fairfield also designed and built a custom NFS-based storage system. As more powerful computing hardware and software applications were added to the infrastructure, older end-of-life storage was replaced with newer and faster storage technologies. But the switchover began to uncover cracks in the previously robust production system. Problems surfaced in overall stability, management, and serviceability. In addition, Fairfield experienced challenges obtaining vendor management support for the company's HPC infrastructure. With no single

SUMMARY

Industry:
Oil and Gas exploration services

- **The Challenge:**
Unreliable storage architecture due to lack of stability, manageability, and serviceability severely impacted Fairfield's ability to deliver timely and accurate seismic images to waiting oil and gas customers.
- **The Solution:**
 - Panasas ActiveStor Parallel Storage with the patented PanFS™ object-based parallel file system and DirectFLOW client software
 - A world-class support team of Panasas experts providing a single point of contact in managing the Fairfield HPC and storage infrastructure
- **The Result:**
 - Enhanced reliability and ease of management
 - Superior service and support from Panasas support experts
 - Reduced storage footprint while increasing storage capacity
 - Reduced administration time, with increased IT productivity

point of management and support, Fairfield’s production system sputtered and struggled to keep pace with mounting seismic processing demands.

“Our applications were becoming increasingly more complex, so we had to make sure the storage technology was bullet-proof and capable of withstanding the processing demands that we knew would continue to grow. We had already designed our cluster to be 100 percent efficient, so reliability was becoming a critical issue. It was clear we needed enhanced reliability and management features in our data storage solution. The search was on,” said Rowbatham.

The Solution

Fairfield Industries has replaced its older NFS-based storage with Panasas parallel storage running in conjunction with existing storage that has not reached its end-of-life cycle. Unlike the existing storage systems, Panasas parallel storage has taken charge of the heavy-duty, processing operations that demand long-term reliability and stability. Fairfield evaluated Panasas parallel storage during a month-long evaluation period running it non-stop with benchmark data to test its reliability and performance. Although performance wasn’t the driving factor, the company experienced improved I/O performance in addition to enhanced ease of use, manageability, and improved vendor service with a dedicated service contact.

In addition, the Panasas parallel storage has replaced two racks of previous storage systems with a much smaller storage footprint. This will enable Fairfield to add more compute capacity when needed, without requiring more data center real estate or cooling requirements. “Before installing Panasas storage we had racks and racks of storage that we had to design a specific way to maintain an acceptable performance

ratio. Now, we’ve replaced two racks of existing storage with a half of a rack of Panasas parallel storage, and the performance is even better although it is more than we need at this time. We’ve been able to fit a lot more storage within a smaller space and will be able to accommodate all of the storage capacity needed as more customer jobs come online,” said Rowbatham.

The Result

After a rigorous month-long evaluation program, Panasas ActiveStor Parallel Storage was immediately deployed into Fairfield’s production system. Not only did the Panasas parallel storage deliver enhanced reliability and ease of management, the storage solution was also backed by a superior team of Panasas service experts who came in and brought the Panasas system online in less than one day. The Panasas team also provided a one-stop shop for keeping the system up and running, freeing up Fairfield administrative time for more customer work, and reducing overall operational costs.

Panasas ActiveStor Parallel Storage includes the patented DirectFLOW® protocol, a direct access path between Fairfield’s Linux cluster nodes and their storage, eliminating delays inherent in traditional SAN and NAS architectures. The additional benefits of this increased efficiency allow Fairfield to take on and complete more customer projects in a shorter amount of time, improve IT productivity, and further reduce the overall cost of ownership in their IT infrastructure investments.

The ActiveScale operating environment featuring PanFS™ parallel file system with its patented object-based architecture allows Fairfield to maximize application performance and eliminate storage system complexities. Also, the single global namespace and the parallel reconstruction capabilities of the solution contribute to superior ease of management.



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