



## CASE STUDY

# StorNext Scale-out Storage Provides a Powerful Platform for High-Performance Computing at Xinjiang Oilfield Company

Fueled by new demands for oil and gas exploration, the leading oilfield company in Western China outgrew its storage infrastructure. The answer was an integrated Quantum StorNext scale-out storage solution—with fast and easy deployment, and the performance and scalability to meet the company’s needs, now and in the future.



中国石油天然气集团公司  
CHINA NATIONAL PETROLEUM CORPORATION

FEATURED PRODUCTS



“The StorNext storage solution gives us the high performance and responsiveness we need. Combined with its ease-of-use and manageability, StorNext does a great job supporting our large-scale computational projects.”

**Zhang Feng**

Director of the Information Center, Xinjiang Oilfield Company



Quantum has provided us with a mature storage solution that has been proven in the oil industry, with a well-designed architecture that provides superior flexibility and scalability to meet the demands of our high-performance computing environment.

**Zhang Feng** - Director of the Information Center, Xinjiang Oilfield Company



## SOLUTION OVERVIEW

- StorNext Scale-out Storage
- StorNext QD6000 RAID arrays, 300TB
- StorNext Metadata Appliances
- StorNext Gateway Appliances

## KEY BENEFITS

- Exceptional performance, with sequential write speeds of up to 3.6GB/s, provides faster processing to shorten project timelines
- Support for InfiniBand and IP connectivity gives the Institute an optimal combination of performance and value
- Dual-controller and path-failover architecture provides reliability and ensures safety of data
- Quantum's experience in oil industry provides optimized performance and simplified deployment
- Scalability of both performance and capacity supports future growth

The Institute of Research, Exploration and Development, a department of the Xinjiang Oilfield Company, is a leader in applying science and technology to the most challenging work in the petrochemical industry: finding hidden oil reserves. Even in a resource-rich region like the Junggar Basin, finding the right locations that are likely to yield the most oil and gas is difficult, data-intensive work. The basic system relies on analyzing seismic reflection data—the results of setting off controlled seismic events, interpreting the results to construct detailed maps of the underground strata, and deciding which are likely to produce the best results.

### NEEDING HIGH-PERFORMANCE STORAGE FOR HIGH-PERFORMANCE COMPUTING

Using specialized software applications, multi-step parallel processes are run against the raw data, which requires a high-performance storage platform—and generates a huge amount of data. The Institute's data center dedicates about 640 nodes and 7,000 cores to

the computational analysis, and at each step in the process more and more data is generated. A typical project generates 30TB to 40TB. Multiple projects are carried out each year, requiring the addition of over 100TB of storage capacity per year.

### NEEDING TO MANAGE INCREASING OIL & GAS EXPLORATION ACTIVITIES

As Xinjiang Oilfield's parent company, PetroChina, placed greater emphasis on developing western resources, research and development activities increased. The Institute at Xinjiang Oilfield Company realized that its existing disk storage and network attached storage (NAS) infrastructure would not be able to handle the increased demand. The IT team needed a new storage solution to support higher speed parallel processing—both higher bandwidth and faster I/O connections between the compute clusters and storage. The team placed a premium on performance, including InfiniBand support for applications sensitive to network bandwidth.

The storage solution also needed to support their existing CGG applications, in addition to providing fast and easy installation, plus scalability for future growth.

### **ADOPTING A HIGH-PERFORMANCE STORAGE PLATFORM FROM QUANTUM**

To meet the I/O and throughput demands of the Institute's large-scale parallel computing environment, and to support the new InfiniBand network architecture, the Xinjiang Oil Field team selected a StorNext scale-out storage solution from Quantum. It includes StorNext QD6000 RAID disk storage, dual-redundant StorNext Metadata Appliances to manage the storage and provide high-performance parallel access to the data, and StorNext Gateway Appliances to provide high-speed access to clients and applications over Ethernet. The storage platform supports InfiniBand for jobs needing the highest processing speeds, but also provides IP connectivity for day-to-day operations. In addition, StorNext is fully compatible with all the standard applications used for oil and gas exploration, including CGG applications.

### **DEPLOYING A PROVEN STORAGE SOLUTION PROVED TO BE QUICK AND EASY**

Deployment was fast and simple—due to the combination of Quantum's preconfigured and tested storage solution plus Quantum's experience with oil and gas exploration in other

regions. The entire project—which included preparing all the equipment required on the project site, installing of hardware, building the operating environment for various applications, deploying the network, testing, adjusting and optimization—was completed in just two months.

"The new InfiniBand network architecture enabled better performance and higher speed than the previous IP network. The overall speed of our operations was dramatically improved—and thanks to the adjustment and optimization process—the entire system operates smoothly," explains Zhang Feng, director of the Information Center at Xinjiang Oilfield Company. "The project was completed quite rapidly and drove our business growth effectively."

### **POWERFUL TECHNICAL SUPPORT & TRAINING FROM QUANTUM MEETS THE DEMANDS OF THE INSTITUTE'S HPC WORKFLOWS**

Quantum's support throughout the process was the key to its success. In addition to an end-to-end system and technical support, Quantum also provided in-depth training for the Institute's IT personnel throughout the project's implementation. Quantum's experience working with other oilfield exploration companies was also an advantage, allowing the technical team to deploy the system quickly and fine-tune it to improve performance with specific, critical applications.

"The new InfiniBand network architecture enabled better performance and higher speed than the IP network. The overall speed of our operations was dramatically improved—and with the aid of Quantum's experience implementing storage projects in other oilfields, we were able to further optimize performance of the entire system."

#### **Zhang Feng**

Director of the Information Center,  
Xinjiang Oilfield Company





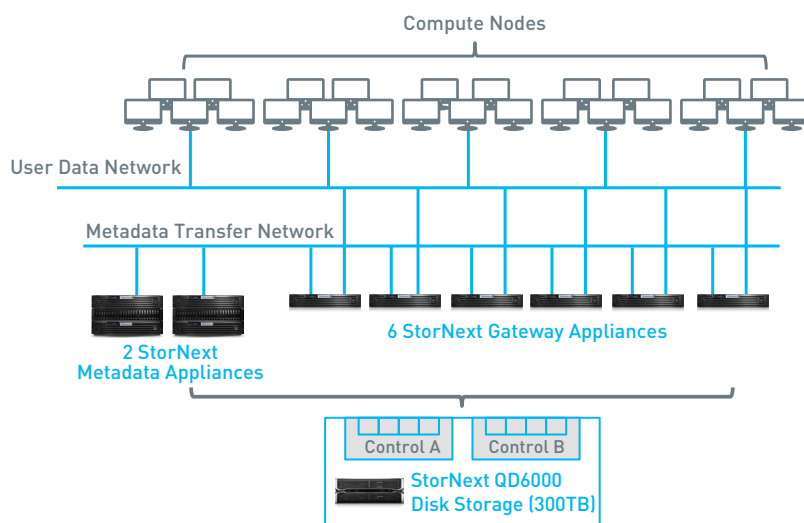
“Quantum has provided us with a mature storage solution that has been proven in the oil industry, with a well-designed architecture that provides superior flexibility and scalability to meet the demands of our high-performance computing environment,” says Feng. “In terms of actual application, the solution provides high performance and responsiveness as expected. Finally, with excellent usability and manageability, the solution provides great support for us.”

### LEVERAGING STORNEXT SCALE-OUT STORAGE AS A PLATFORM FOR GROWTH

The scalability of the StorNext solution provides the Institute with an effective path for growing its system in the future, in response to increased data needs. New storage arrays can be added easily to the existing environment, with the new capacity seamlessly becoming part of the existing storage pool, available to all existing users and applications.

### ABOUT XINJIANG OILFIELD COMPANY

Located in Karamay City, Xinjiang Province, the Xinjiang Oilfield Company—a part of PetroChina Company Limited—is the largest petroleum-producing enterprise in western China. The company is primarily engaged in oil and gas exploration and development, extraction and transportation, and scientific research. The company is one of the leading companies in China’s petroleum industry, with accumulated oil production of 200 million tons. The company’s Institute of Research, Exploration and Development is in charge of conducting the search for new deposits using high-performance computing techniques.



Quantum StorNext Scale-out Storage solution architecture for the Institute of Research, Exploration and Development at Xinjiang Oilfield Company

To contact your local sales office, please visit [www.quantum.com](http://www.quantum.com)

**Quantum**