Energy Industry Storage Solutions

QuantaStor Software Defined Storage for Energy Industry Workflows

Energy companies produce prodigious amounts of data from sources ranging from seismic geological surveys to the monitoring of transmission and distribution systems. This creates great challenges for IT organizations in the energy space both in terms of the scale of the systems and data being managed and the resulting complexity that often comes with it. At OSNEXUS we're dedicated to making hyper-scale storage management easier while also making it secure and compliant to the high regulatory requirements needed by the energy industry.

Storage Grid Technology

Just as the energy industry links power stations together to form the energy grid, OSNEXUS QuantaStor enables energy companies to combine storage appliances across sites and datacenters into a distributed storage grid. QuantaStor storage grids can be expanded using servers from any of the major server vendors so it brings new levels of flexibility and IT agility to the energy industry.

Security Enforcement

Grids also play an important role in security enforcement. Within QuantaStor the security policy is set for the entire grid within the Security Manager in just two clicks to make it compliant with NIST 800-53 & 800-171. This ensures proper password policy enforcement and other rules mandated by these government standards on the energy industry.

QuantaStor also includes one of the industry's most powerful role-based access control systems (RBAC) which enables IT organizations to create Roles for users which follow the security principle of least privilege. The patented security model in QuantaStor takes that a step further by enabling IT organizations to further scope permissions to specific groups of resources within a grid so that different IT administrators that are sharing a storage grid are not able to access or view another department's assets.

Unified File, Block & Object

The needs of the energy industry are wide-ranging with block storage requirements for iSCSI & FC being commonly used for virtualization and bare-metal servers as well as file and object storage for unstructured data, databases, and large-scale data warehousing and backups. With QuantaStor all the storage needs are met with a single platform which delivers file (NFS & SMB), block (iSCSI & FC), and object storage (S3 & SWIFT) in a single platform.
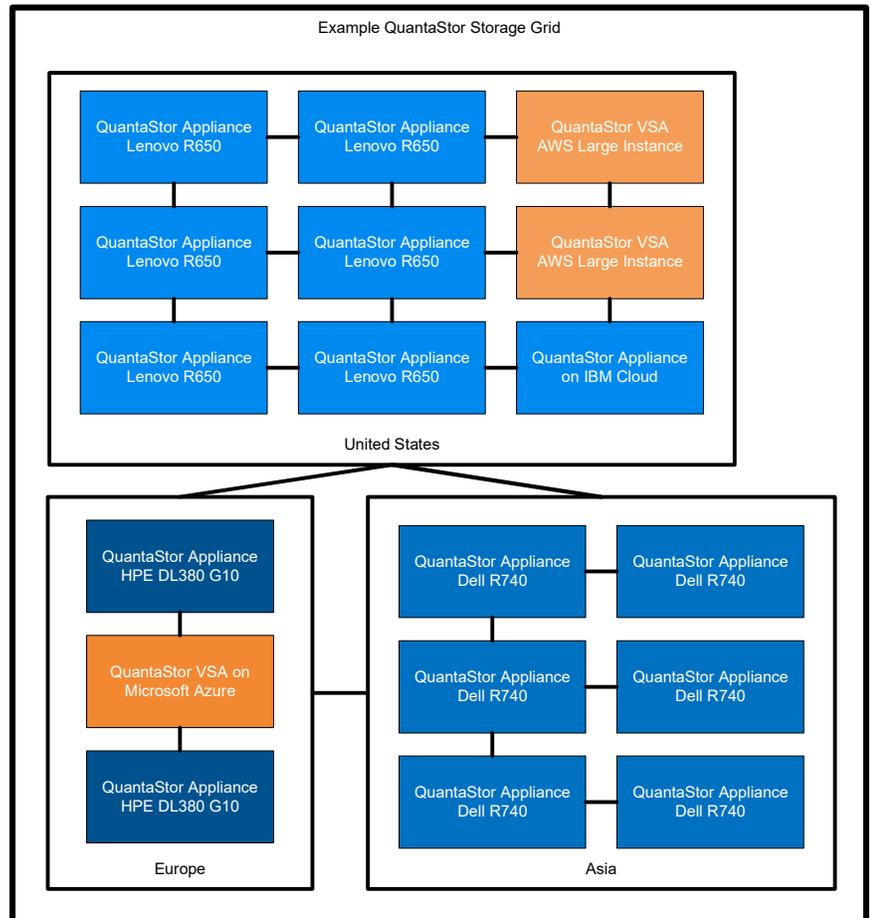

Figure 1. QuantaStor's control-plane technology combines systems into a federated storage grid which can span sites and datacenters. IT administrators can control the entire grid from any appliance using the web management interface, REST APIs or via the QuantaStor CLI.

Long-Term Innovation

OSNEXUS is also one of the largest commercial contributors to OpenZFS development and leverages open source enterprise storage technologies which ensure long-term innovation and longevity of the underlying data formats for decades to come. This is especially important for areas like nuclear reactor designs and other engineering content that must be kept for over 50 years to ensure the serviceability of designs and power-generation systems decades after their implementation.

Automation

With the great scale at which Energy companies must manage data comes a great need for automation technologies to help IT organizations simplify common tasks. To assist that effort QuantaStor was designed from the ground up as a Service Oriented Architecture which means that every feature that is available via the web interface is also available via the REST API and the CLI. Today QuantaStor has over 500 APIs and with a storage grid, the API calls can be directed to any appliance within the grid to manage the entirety of all appliances within the grid. This is transformative for IT organizations because it drastically reduces the complexity of automating operations because all appliances are managed as one unit, the grid, rather than disparate disconnected systems using different APIs, protocols, and various IP addresses to communicate with.

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Common Use Cases

High-Performance Computing
OSNEXUS is used for a variety of use cases including High-Performance Computing at companies like TerraPower, a developer of new ultra-safe nuclear reactors. TerraPower has a large Windows-based HPC cluster which demands ultra-high performance and highly-available SMB storage. QuantaStor met this need with a tiered configuration using QuantaStor appliances combined with a layer of aggregated FC storage on the back-end to produce a high-performance hybrid storage solution which exceeded the performance of their previous system by 300% and at a lower cost.

Server Virtualization
Major energy companies like Exelon Energy use QuantaStor as back-end storage for VMware virtual machine workloads. With QuantaStor's grid technology Exelon was able to easily setup replication of storage to a DR site in just a few clicks to ensure quick and easy failover in the event of a site outage.

## Key Advantages of QuantaStor SDS for Energy and Utilities

Grid Technology
QuantaStor SDS was designed with an advanced storage grid technology which enables QuantaStor storage appliances to be linked together and remotely managed as a single unit. OSNEXUS storage grid technology eliminates the complexity that historically has burdened storage administrators of traditional storage solutions. Rather than having to manage the security, maintenance, and monitoring of storage systems one by one, the grid technology makes it easy to manage huge multi-site storage environments with a heterogeneous mix of hardware.

Encryption and Security
To counter cyber threats and ensure compliance, QuantaStor SDS includes end-to-end security coverage enabling multi-layer data protection "on the wire" and "at rest" for enterprise and cloud storage deployments. Combining protocol-level encryption with SMB, IPsec and HTTPS across any storage grid, hardware and software disk drive encryption with Intel AES-NI technology and advanced user security featuring role-based access controls, QuantaStor SDS end-to-end security is ideal for any energy or utility company use case.

High-Performance Computing
As High-Performance Computing (HPC) becomes critical for companies that need to get the most value out of their information assets, QuantaStor's HPC Storage Solution works alongside compute systems to meet both high-performance and high-availability storage requirements for applications including computational fluid dynamics, Monte Carlo simulations, Seismic Data Processing, and simulations. QuantaStor plays an important role in HPC deployments by providing IT architects with the latest in storage software and hardware compatibility so that the HPC solution can be designed specifically to meet any extreme workload need.
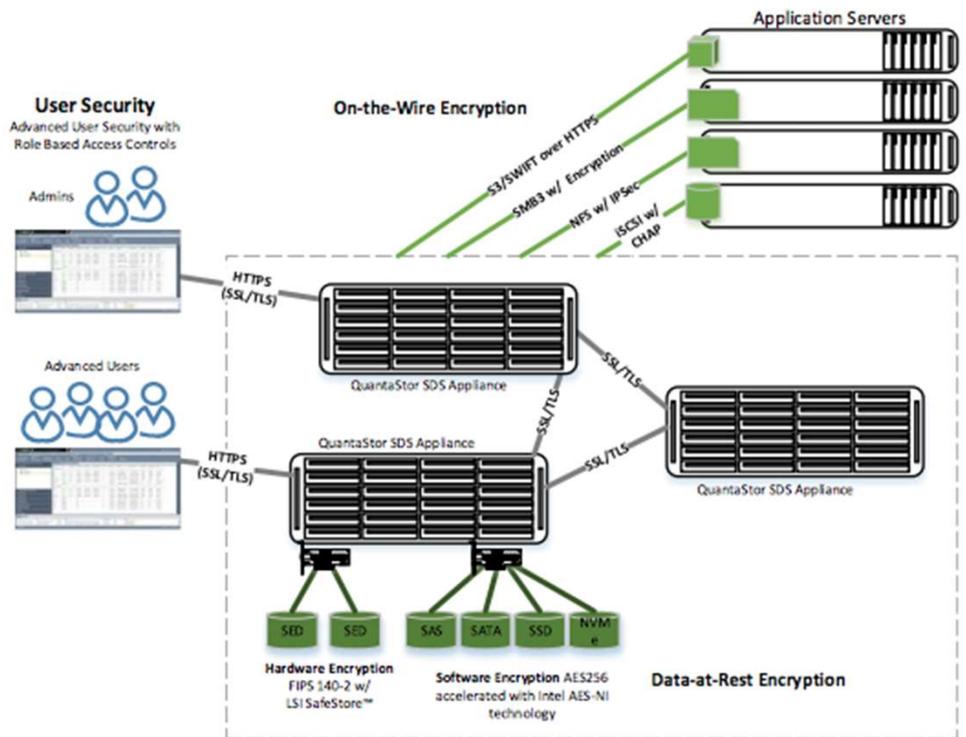
Data Migration Edition
QuantaStor SDS Data Migration Edition enables enterprises to easily migrate and transport multiple terabytes of file, block and object storage between datacenters and on-premises sites using mobile hardware and a custom licensed edition of QuantaStor SDS tailored for data migration needs. Use cases for QuantaStor SDS Data Migration Edition include cloud storage migration, datacenter consolidation, disaster recovery, content distribution, and workflows where today's WAN technologies are insufficient and too expensive for large data transfer.

Summary
OSNEXUS QuantaStor provides a broad spectrum of storage technologies and encryption features to meet the specific needs of energy industries. For more information on how QuantaStor and OSNEXUS can help bring new levels of IT agility to your organization please contact us at sales@osnexus.com.