

Scalable File Services Solutions

Challenge

File-based data—audio, video, graphics—as well as standard file types such as .pdf and .ppt—continue to grow in size at an alarming rate. With the rapidly growing increase in this data, IT managers face enormous challenges in developing efficient file sharing solutions to meet the demands.

Storage companies have introduced a variety of products that promise more efficient file-sharing capabilities, but as file-based data continues to grow, it becomes clear that these current solutions are falling short. Robust and data-intensive applications can quickly overwhelm the capacity and performance limits of traditional storage systems. And until recently, the only solution was to add incremental “islands of storage,” which only added several layers of complexity and resulted in inefficient resource utilization.

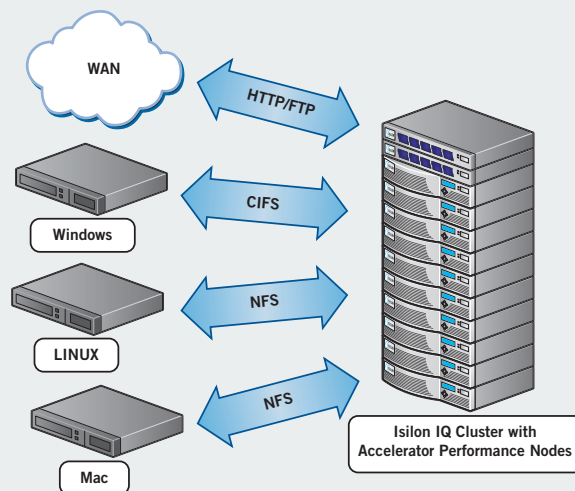
The ideal file serving solution, then, is one that supports growth tomorrow and provides flexibility in its deployment today. All file resources should be stored in a single, consolidated, highly scalable, highly available storage pool. The solution should also be flexible enough to match storage resources to changing requirements and disparate environments that enable enterprises to transform data into information—and information into breakthroughs.

Solution

Isilon IQ® was conceived from the ground up to establish a new class of storage—clustered storage—designed specifically to deliver file-based data to heterogeneous clients while providing the highest levels of reliability, performance, scalability and management simplicity.

Isilon’s OneFS® file system software, now in its fifth generation, provides the intelligence behind the award-winning Isilon IQ family of clustered storage systems. It combines the three layers of traditional storage architectures—file system, volume manager and RAID—into one unified software layer, creating a single intelligent symmetric file system that spans all nodes within a cluster. OneFS provides a single point of management for large data stores, faster access to large files, inherent high availability and the ability to easily scale a single cluster’s capacity—all from a single network file system.

Isilon IQ is a fully distributed architecture in which all nodes work together to form a unified file system that is tolerant of any component failure, including entire nodes. It goes beyond traditional RAID to protect against multiple failures in a cluster without losing data availability, and leverages the compute power of all nodes to deliver the fastest drive rebuild times in the industry. In addition, Isilon IQ clusters provide flexible protection levels on a file-by-file basis, ensuring that files are protected independently from the location they are stored in.



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Key Benefits

Increased Performance and Scalability For File Services

Each Isilon IQ node contains disk capacity, CPU, memory and network connectivity. As additional Isilon IQ nodes are added to a cluster, all aspects of the cluster scale symmetrically, including capacity, throughput, memory, CPU and network connectivity. Contrary to traditional designs, adding capacity does not create bottlenecks with other system resources. Isilon IQ offers unmatched aggregate throughput from a single file system of up to 20 GB/second, with up to 2.3 petabytes of storage. And Isilon's SmartConnect software detects NFS connection failures and automatically fails over clients to available cluster nodes.

In addition, Isilon IQ Accelerator-x platform extension nodes enable single stream performance of up to 400 MB/second, concurrent performance of up to 700 MB/second and delivery of over 26,000 transaction I/Os.

Heterogeneous Client Support

OneFS ships with native support for Windows®, Unix and Macintosh clients using NFS, CIFS, HTTP and FTP. It integrates seamlessly into the existing authentication and access control infrastructure using Active Directory, LDAP, NIS or a combination of all three, allowing different groups in an organization to easily share files and streamline workflows.

Protects Against Failures

Isilon's OneFS operating system ensures the integrity of the file system in the event of unexpected failures during any write operation. OneFS constantly monitors the health of all files and disks and maintains records of the smart statistics (e.g. recoverable read errors) available on each drive to anticipate when that drive will fail. When OneFS identifies at-risk components, it preemptively migrates the data from the suspect disk to available free space on the cluster in a manner that is both automatic and transparent.

Isilon SnapshotIQ™ provides unlimited point-in-time snapshots of entire file systems or selected portions, allowing nearly instantaneous end-user recovery of lost or corrupt files or directories, eliminating slow and costly tape restores. And Isilon IQ SmartConnect with failover detects NFS connection failures and automatically fails over clients to available cluster nodes without client-side drivers.

Management Simplicity

The unparalleled reliability and scalability of Isilon IQ brings a tremendous improvement in management overhead. Enterprises can administer over a petabyte of storage in a single fault-tolerant cluster instead of many small islands of storage with widespread single points of failure.

A Single File System

OneFS, now in its fifth generation, represents a significant advancement over the conventional approach of separate layers for RAID, volume management and file system. OneFS combines these three layers into one unified software layer, creating a single intelligent symmetric file system that spans all nodes within a cluster. OneFS provides a single point of management for large content stores, faster access to large content files, inherent high availability and the ability to easily scale a single cluster's capacity, all from a single network file system.

Additional Benefits to File Services

The Isilon IQ architecture delivers these benefits to large-scale file services environments:

- Simple management for scalable and reliable file services
- The highest levels of availability, with the ability to sustain multiple drive or node failures with no downtime or data loss
- Virtually unlimited scalability—up to 96 nodes in a single cluster and up to 2.3 petabytes in a single file system
- Maximum performance—unlike competitive offerings, adding disk capacity increases performance through additional CPU, cache (memory) and network connectivity
- Network bandwidth and disk capacity can be added independently with the IQ Accelerator-x and EX 6000, EX 9000 or EX 12000 storage expansion nodes
- OneFS operating system provides high performance, fault tolerance and a common management environment to reduce ongoing costs
- Native support for mixed client environments—Windows, UNIX, Linux and MAC
- Full Windows Active Directory Support and ACLs, LDAP and NIS for file, user and group authentication

Isilon Clustered Storage

- Reduces storage costs
- Increases IT operating leverage
- Speeds workflows
- Unlocks new revenues
- Complementary

Related Products

Isilon IQ Platform Nodes

The Isilon IQ 1920, 3000, 6000, 9000 and 12000 platform node systems use standard Gigabit Ethernet for front-end connections and offer the option of Gigabit Ethernet or high-performance, low-latency InfiniBand® for intracluster communication at no additional charge.

Isilon IQ Accelerator-x

The Isilon® IQ Accelerator-x extension node was designed to enable Isilon clustered storage customers with high-performance requirements to meet their specific workflow needs by modularly and cost-effectively scaling throughput. Powered by Isilon's OneFS® operating system software, Accelerator-x nodes can be seamlessly added to any Isilon IQ 1920, 3000, 6000, 9000 or 12000 storage cluster using InfiniBand® networking to independently scale aggregate throughput up to 20 GB/second.

EX 6000 / EX 9000 / EX 12000

Designed as an extremely low cost, high-capacity clustered storage product, each Isilon EX 6000 contains 6 terabytes of SATA-II disk capacity (9 terabytes for the EX 9000 and 12 terabytes for the EX 12000) in a 2U form factor and utilizes state-of-the-art Serial Attached SCSI (SAS) technology to connect to an Isilon IQ 6000, 9000 or 12000 platform node. By leveraging Isilon's OneFS operating system software with Isilon's unique clustered-storage architecture, the combined products create a high-density storage solution that can modularly scale to hundreds of terabytes of capacity in a single unified cluster and single file system.

SnapshotIQ™

SnapshotIQ represents a significant advancement over traditional snapshot technology. Isilon snapshots are highly scalable and typically take less than one second to create, incurring little to no performance overhead, regardless of the size of the file system or directory being snapshot or the level of production activity on the cluster. Moreover, only changes to blocks that make up a file are reflected in updates to the current version of snapshots, thereby ensuring highly efficient snapshot storage utilization.

SmartConnect™

SmartConnect, a licensable software module of Isilon's OneFS operating system software, greatly simplifies client management across the enterprise. Through a single host name, SmartConnect enables client connection load balancing and dynamic NFS failover and fallback of client connections across storage nodes to provide optimal utilization of the cluster resources.

Customer Success



Pratt & Whitney, a United Technologies Company (NYSE: UTX), is a global leader in the design, manufacture and support of aircraft engines, gas turbines and space propulsion systems and uses Isilon IQ clustered storage as the primary storage system for its gas turbine engine test facilities.

“The use of clustered storage produces meaningful improvements in our jet engine testing. Isilon IQ has enabled us to streamline our testing analysis and appreciably reduce costs while maintaining our uncompromising commitment to safety and quality.”

—Dr. Zbigniew Grabowski, Engineering Information Technology Program Manager for Pratt & Whitney



The Incorporated Research Institution for Seismology (IRIS) made an initial 60 terabyte purchase of the Isilon IQ 6000 to accelerate the collection and delivery of its seismology data stores. IRIS, supported by the National Science Foundation, other federal agencies, universities and private foundations, is dedicated to exploring the Earth's interior through the collection and distribution of seismographic data.

“The IRIS Data Management Center receives several tens of terabytes of new seismic data annually on a continuous and uninterrupted basis from more than 1,000 seismic stations around the globe. We needed a storage solution that would minimize the administrative burden and allow us to expand the system capacity with a minimum amount of interruption. The intelligence built into the Isilon IQ 6000 product allows us to do exactly that and we will be able to reduce our operating costs and greatly simplify our storage management. Most of our future storage growth will be directed toward the Isilon storage solution.”

—Tim Ahern, IRIS Data Management System

Isilon IQ Clustered Storage

The Isilon IQ family of clustered storage systems was designed from the ground up to meet the needs of data-intensive enterprises and high-performance computing environments. By combining Isilon's OneFS® operating system software with the latest advances in industry-standard hardware, Isilon delivers modular, pay-as-you-grow, enterprise-class clustered storage systems.

- Powered by OneFS operating system software, distributed file system creates a single, shared global namespace
- First and only truly symmetrical clustered storage architecture
- System can scale from 4TB–2.3PB in a single file system
- Single stream performance of more than 400 MB/second, concurrent performance of 700 MB/second and over 26,000 transaction I/Ops
- Unmatched aggregate throughput from a single file system with up to 20 GB/second
- Industry leading, high availability for clustered storage systems
- Powerful, easy-to-use Web-based management
- 60-second scaling of both capacity and performance
- Built-in, automatic application/client connection load balancing
- Industry-standard protocol support (NFS, CIFS, HTTP, FTP, NDMP, SNMP, LDAP, ADS, NIS)



About Isilon Systems

Isilon Systems is the worldwide leader in clustered storage systems and software for file-based data, enabling enterprises to transform data into information—and information into breakthroughs. Isilon's award-winning family of IQ clustered storage systems combines Isilon's OneFS operating system software with the latest advances in industry-standard hardware to deliver modular, pay-as-you-grow, enterprise-class storage systems. Isilon's clustered storage solutions speed access to critical business information while dramatically reducing the cost and complexity of storing it.

The evolution of storage is clustered storage built on a powerful, open operating system with unique software that lets you pay-as-you-grow. Visit www.isilon.com/contact to get started—and see why clustered storage is paying off for some of the biggest and most respected names in the world.

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