Note: Archive Software coverage has been discontinued. The Quantum StorNext Product Brief is no longer receiving updates as of September, 2023.

Quantum StorNext

Overview

Quantum StorNext is a high-performance parallel file system that includes multiple elements for controlling movement of files between tiers of storage and to archive devices. **StorNext is more than an archiving solution but archive is a prime use case.**

The StorNext software is complemented by a variety of Quantum storage systems and appliances, including storage arrays, ActiveScale object storage, and StorNext AEL tape libraries.

The most recent version of StorNext, is StorNext 7 which containerizes the components of the StorNext architecture, making it available in converged appliances and in the public cloud.

StorNext is a software defined solution that can be deployed in several ways, and with different architectures. Quantum provides multiple StorNext appliance offerings including H Series (Converged), F Series (NVMe), QXS Series (General Purpose scale out), and XCellis systems. StorNext is also available as a software only solution, and can be deployed as a cloud service in AWS.

In general, StorNext is comprised by a number of components including the following:

- StorNext File System – An installable file system for clients connected to a SAN to access data that is managed in the StorNext system. Linux, UNIX, Windows, and MacOS (through Apple XSAN) are supported.
- StorNext Metadata Controllers – Software that is installed on Windows or Linux servers to manage access and location of data.
- StorNext Storage Manager – Software that runs on the MDCs and is a policy-based data mover that can transparently copy or move data between tiers of storage and archive data to another storage system while retaining direct access through the StorNext File System.

Highlights

- Data management software for archiving, tiering, and sharing of files
- High-performance file access with installable file systems
- Metadata Controller for access control
- Data movers managed by Metadata Controller
- Containerized architecture in StorNext 7
- Available as an AWS service
- Advanced features
  - QoS
  - Replication
  - File auditing
  - Cloud tiers
  - File system pools

- Distributed LAN Clients (DLC) – Clients without the high-performance transfer requirements can connect to the StorNext environment through StorNext DLC Gateway servers over a LAN.

In StorNext 7 on H series appliances, as well as StorNext deployed on the public cloud, these elements are virtualized and deployed in Docker containers.

The Xcellis arrays integrate the Metadata Controllers (MDCs) with primary storage, but the MDC software can be installed on separate servers. The MDC's provide both access control for files and the index to where they are stored. The StorNext File System (SNFS) installed on servers communicates with the MDCs.

The MDCs control movement of data between tiers and archiving to other storage systems based on policy settings from StorNext Storage Manager (SNSM). Replication of up to four copies of data is also done by the Storage Manager.

Quantum StorNext 7 provides advanced features for managing and protecting data, including the following:

- Archiving – StorNext Storage Manager supports policies to move data for the purposes of archiving other devices such as Quantum Lattis or LTO tape libraries. Policies are at the directory level for establishing rules on operations. Files may be stubbed (up to 2TB of aggregated stubs) to allow transparent, automatic recalls and views of file metadata information.
- Retrievals can redirect the storage location for performance purposes such as moving to primary storage based on the policy settings.
- Distributed Data Movers – Software data movers in the StorNext Storage Manager are used to move data between storage systems and archives. Multiple data movers may be instantiated based upon the amount of activity in movement between tiers.
- File System Pools – StorNext 7 supports pools to be created of NVMe, SSD, or HDD devices within a filesystem. Policies can then be set to assign and move files between pools to be placed on the appropriate media.
- Partial File Retrieval – StorNext supports Partial File Retrieval where the data transferred from a sequential file can start at an offset into the file. The offset is controlled by a timecode which is established by the application and communicated to StorNext through an associated XML file. The most common example of usage is with video files with production systems controlling the location for access.
- Flex Tier Cloud support – Public clouds from Amazon, Microsoft Azure, and Google; private clouds by NetApp, IBM, and Scality
- Client-based Quality of Service – Bandwidth limiting or guaranteed bandwidth by client.
- File system auditing – Activity trail for files and metadata

- Self-describing objects – User defined metadata fields

Usage

StorNext is used in environments with a very large number of files and large file sizes. Many deployments are seen in the Media & Entertainment industry, Oil & Gas, and usage such as genomic research.

- Characteristics
  - Performance – The combination of LAN clients and parallel block SAN access optimizes overall system performance. Partial File Retrieval increases performance by not transferring unwanted data.
  - Availability – MDCs are configured in high availability pairs. Multiple pairs may be installed for greater availability and functionality.
  - Replication for BC/DR – Up to four copies may be remotely replication using asynchronous replication.
  - Cross protocol locking allows shared files across SAN, NFS and SMB.
- Applications
  - StorNext can work in any file-based environment.
  - Integration with Media Asset Managers include CatDV, Cinegy, Dalet, NOA, OpenText, Primestream, Reach Engine, Sony, and Vizrt
  - Support of S3 included for object access by applications.
- System environments
  - SNFS installs on Windows, Red Hat, CentOS, SUSE, and MacOS. Vendor documentation should be consulted for the latest information.
- Deployment and Administration
  - StorNext has its own management software.
  - Use of metadata controller appliances reduces the complexity.
  - Professional services are available.
  - StorNext 7 available in the public cloud, or as converged appliances with containerized services

Evaluator Group EvaluScale™: Quantum StorNext

Evaluator Group product review methodology "EvaluScale" assesses each product within a specific technology area. The explanation of how products are reviewed can be found in the **Evaluation Guides**.

	Criteria	Description	Requirement	EG View of Quantum StorNext	Explanation for Quantum StorNext
1	File archiving capability with Archive Functions	Ability to archive files and manage the deletion or stubbing actions: archive & delete, archive & leave, archive & stub	Archiving of files with the set of archive functions is the basic requirement. Additional email archiving or SharePoint are additive.	Meets requirements	StorNext has a full set of choices for archiving actions
2	Detailed criteria for selection of data to archive	Set of criteria for administrator to create policies for data selection.	Criteria such as last time accessed, owner, last time modified, etc. are necessary for selection and a requirement. Must also have an exclude capability.	Exceeds requirements	Full set of criteria for selection and exclusion.
3	Support for target systems for archive	Target systems: NAS, object storage, archive systems, cloud	Archiving targets are often NAS systems. A target could also be an object storage system using a native object protocol. There are archive systems that manage access that may be targets as well.	Exceeds requirements	Supports NAS, object storage, and public and private clouds.
4	Access protocols supported – CIFS/SMB, NFS, S3	Support for file or object protocols to target device.	The requirement is to support access to the target device through file and object protocols.	Exceeds requirements	File and object protocols supported at the same time.
5	Compliance capabilities	Features to support regulatory compliance	Much of data has either regulatory compliance or business governance rules. The compliance features to meet this requirement include WORM setting, retention controls, audit trails, security access, and permissions.	Meets requirements	Many compliance features included.
6	Leave symbolic link/stub in NAS or filesystem	Support transparent access by leaving link or	Automatic retrieval of an archived file requires a link or stub to replace the file	Meets requirements	Windows filesystem, NetApp, and Dell EMC Unity/VNX/Celerra

		stub in place of file.	and then cause the retrieve action. Transparent access through this method is the basic requirement.		systems have transparent access.
7	Operating systems supported	Usage environments include Windows, Linux and other OS's	The primary requirement is to support both Windows and Linux environments. Other types of Unix systems would be a positive as well.	Meets requirements	Windows, MacOS, and Linux/Unix supported.
8	Versioning support	Store duplicate copies as unique versions and manage version access.	As part of support for WORM mode and self-protecting storage, versioning capability is required. Assigning trimming controls by groups is an advantage as well.	Meets requirements	Included versioning feature as part of compliance.
9	Data reduction	Techniques to reduce the amount of duplicate data stored.	The requirement is for data reduction, which could be any of compression, single instancing, or deduplication.	Meets requirements	Deduplication of data is supported.
10	Encryption	Encryption of data at rest with internal and external key management. In flight encryption.	The minimum requirement is to encrypt data as it is archived and provide the keys for key management. Additional function of encrypting data during transfer add advantage.	Area for development	Encryption is not currently supported.

Evaluator Group Opinion: Differentiating elements for Quantum StorNext

StorNext is a mature product for high performance distributed file systems. It is a much broader storage management solution than only file archiving. StorNext should also be considered in the context of overall storage management.

To maximize coverage and optimize bandwidth usage, StorNext implements the concept of LAN Clients that allow protected sources to connect to StorNext Gateway Servers to achieve the same functionality as native StorNext Clients.

Quantum has complemented its software with integration into its storage systems and appliances. StorNext Connect provides comprehensive discovery, management, and monitoring of StorNext environments. Containerization of StorNext 7 and the ability to run StorNext in the AWS public cloud increases the flexibility of deployment and modernizes the StorNext architecture. Evaluator Group expects to see additional StorNext public cloud offerings available in the future.