DATA SHEET

EMC Celerra NSX Series IP Storage

Reach new heights of availability and scalability with EMC Celerra NSX

Meeting the information-sharing challenge

Performance bottlenecks, security issues, and the high cost of data protection and management associated with deploying file servers using general-purpose operating systems become non-issues with the EMC® Celerra® NSX. NSX combines commodity CPUs with flexible and sophisticated Data Access in Real Time (DART) file-serving software into a purpose-built, scalable, clustered file server optimized for moving mission-critical data.

Unparalleled EMC Symmetrix® and CLARiiON® storage technologies, combined with Celerra's impressive I/O system architecture, offer industry-leading availability, scalability, performance, and ease of management.

With Celerra NSX, you get distributed file services in a centrally managed information storage system. You can dynamically grow, share, and cost-effectively manage file systems with multi-protocol file access capabilities. And you take advantage of simultaneous support for NFS, CIFS, and iSCSI protocols, concurrently, that allow UNIX and Windows clients to share read/write access to the same files.

Consolidate storage for all of your NAS and SAN applications

Celerra NSX helps drive down the total cost of ownership of server and storage assets by enabling the consolidation of file servers and applications onto a single, easily scaled, highly available storage infrastructure. And whether that storage system is based on EMC CLARiiON or Symmetrix arrays, you can be assured that your data will always be safe and available whenever and wherever it's needed.

Celerra NSX system elements

The Celerra NSX provides a highly available cluster of dedicated file server blades, called X-Blades, connected to a Fibre Channel SAN, and managed by a single point of control, the Control Station. Blades are autonomous file servers, providing clients with support for NFS, CIFS, and iSCSI over optical 10 Gigabit and multiple copper and optical Gigabit Ethernet connections. Celerra's X-Blade operating system, DART, is optimized for high-performance network file access. This realtime, embedded operating system runs on each X-Blade to increase performance, simplify management, and scale linearly to accommodate large user communities. The entry configuration for NSX is an advanced cluster consisting of three active X-Blades and a standby X-Blade, ready to take over should an active X-Blade encounter a fault. Over time, the user can non-disruptively add more X-Blades to scale the cluster as the client community expands.

Control Stations provide hardware and file system management, administration, configuration, service failover, and maintenance capabilities. EMC Symmetrix high-end storage systems offer advanced information protection and no-compromise business continuity capabilities, while EMC CLARiiON storage systems provide similar functionality in a cost-effective package. Both storage systems lead the industry in terms of price/performance, and offer support for high-performance Fibre Channel (FC) and high-capacity, lower-cost drives in the same array.

The Big Picture

- Ensure no-compromise availability through integrated advanced clustering, managed as a single device
- Receive advanced functionality at no extra cost with the most comprehensive suite of built-in features
- Leverage EMC Celerra's price/performance leadership to support large user communities with an intuitive, GUI-based, single point of management for up to eight file server nodes in an advanced clustering configuration
- See up to thirty times the performance over standard NAS, using EMC's patented Multi-Path File System (MPFS), which delivers accelerated performance without recoding applications
- Connect enterprise wide with concurrent multi-protocol support for NFSv2/v3/v4, CIFS, FTP, and iSCSI via scalable high-bandwidth optical Gigabit and 10 Gigabit Ethernet and 10/100/1000 BaseT client connectivity
- Concurrently leverage the power of your industry-leading EMC Symmetrix and CLARiiON storage infrastructure
- Centralize file management and backup, reducing operating costs by consolidating file and application data: Celerra NSX offers industry-leading capacity and performance scalability
- Support information lifecycle management (ILM) through tiered FC and ATA support, backup-to-disk, and industry-standard policy-based data migration
- Simplify administration of large Microsoft Windows file-serving requirements through native Windows 2000/2003 management support and features
- Built on EMC Celerra's industry-proven DART file serving software

Scalability: capacity, connectivity, performance

Maximize return on your initial investment. Use the same enclosure to start. Scale up as capacity and performance requirements grow. Increase functionality by adding network file service capabilities to an existing Symmetrix or CLARiiON system. Thus you can take advantage of Celerra's high capacity by consolidating large-scale, multi-server environments on a single system and support varied service levels by scaling IP Storage performance and capacity independently of the storage back end.

Celerra NSX handles peak workloads easily. You can configure up to eight X-Blades to increase capacity and performance.* NSX supports up to 32 TB of FC and/or ATA storage per X-Blade. Add network connections as you add X-Blades. There's no need to offload, reload, or copy data because Celerra NSX allows dynamic file system growth. And, Celerra NSX with either Symmetrix or CLARiiON storage scales non-disruptively to many terabytes of disk capacity. Plus, you can add X-Blades to directly scale performance. Take advantage of MPFS to accelerate file access up to four times over standard NAS without the need to recode applications.

DART's sophisticated feature set

Robust enterprise functionality

DART is the difference that permits Celerra NSX to solve enterprise-wide, mission-critical file-serving demands with support for industry-standard network protocols, data access protocols, networks, and clients. DART addresses performance challenges with optimized NFS, CIFS, and iSCSI system throughput, low latency, and efficient file-locking mechanisms for resolving user contention of shared files. DART offers a virtual provisioning capability to further improve capacity utilization. File systems and iSCSI LUNs can be logically sized to required capacities, and physically provisioned with less so storage does not sit idly in a file system or LUN until it is used.

Automatic file system extension and dynamic iSCSI LUN extension allow the physical allocation to be increased "on the fly," as needed. File Level Retention provides disk-based WORM functionality. FileMover API allows automated policy-based movement of files between tiers of storage. DART's extensible architecture simplifies the incorporation of additional protocols as user requirements change. In addition to rapid, easy upgrades with EMC's modular architecture, the Celerra NSX supports:

- NFSv2, NFSv3, NFSv4, CIFS, FTP concurrently over TCP/IP, UDP/IP, and iSCSI over TCP/IP
- NDMP v1, v2, v3, v4
- Group, user, and directory tree quotas for UNIX and NT file systems**
- And many more function-specific protocols

Network capabilities

Celerra NSX supports Gigabit Ethernet, 10 Gigabit Ethernet, and 10/100/1000 BaseT for client LAN infrastructure connections. DART's VLAN support allows network administrators more flexibility in creating logical workgroups which, in turn, benefits overall network efficiency by localizing broadcast traffic at the workgroup level. DART also includes EMC Celerra Multi-Path File System (MPFS) which provides the benefits of both NAS file sharing and the performance of block access through Fibre Channel/iSCSI SAN. Its advanced software can accelerate NAS application bandwidth up to thirty times that of native NAS without application changes.

Celerra NSX can be configured to survive external failures, such as the failure of a switch or router. Failsafe Networking allows X-Blade network ports to have a dedicated backup port on a separate network card take over in the event of a failure in either the primary adapter or an external switch or router. To increase network link or port availability without having to designate a port as a backup (i.e., idle), Celerra NSX offers IEEE 802.3ad Link Aggregation and Ethernet Port Trunking.

*www.spec.org contains information about Celerra's industry-leading performance levels.

**These provide both hard and soft quotas, user-based quotas based on User IDs (UIDs), and group quotas based on Group IDs (GIDs). Directory-tree quotas are independent of user and group quotas.

Celerra NSX defines high availability

With the Celerra NSX, availability means no-compromise file and block access. You get transparent dynamic failover to a hot standby X-Blade—if an X-Blade encounters a fault, DART uses a metadata logging facility to recover within seconds to minutes. The advanced clustering capabilities allow the hot spare to take over the full workload, running at the same performance and service levels as before the failure. Hardware-based RAID controllers means there is no performance degradation during a rebuild. Other high-end file servers can take hours to reboot and recover large-capacity file systems and will run at reduced performance and service levels until the failing component is replaced and during a RAID rebuild. With dual highly available Control Stations, continuous monitoring and management of the cluster is assured.

To eliminate any single points of failure, Celerra NSX offers redundant load-sharing power supplies, environmental controls, Auto-Call remote maintenance parameter monitoring, and redundant storage and network components. Furthermore, Celerra NSX employs dual integrated uninterruptible power systems, which in conjunction with Symmetrix and its battery-backup facility, will continue to provide file services to clients for an AC power loss of up to 40 seconds.

Availability via replication

In conjunction with Symmetrix, Celerra NSX uses EMC TimeFinder®/FS and Symmetrix Remote Data Facility (SRDF®) software to create consistent disaster recovery copies at distances up to sixty (60) kilometers over Fibre Channel. Alternatively, SRDF/Asynchronous (SRDF/A) can be used over standard wide area network IP connections to implement lower-cost disaster recovery or to support greater distances than synchronous SRDF (SRDF/S).

For customers who prefer to utilize existing IP network infrastructures for file system or iSCSI replication between Celerra-based systems, EMC offers Celerra Replicator™. Both Symmetrix and CLARiiON storage is supported by Celerra Replicator, creating asynchronous point-in-time copies of production file systems or iSCSI LUNs on either a local or remote Celerra system, and maintaining consistent replicas between the sites. Celerra Replicator provides multi-site protection and simplifies administration with easy-to-define business policies including recovery-point objectives (RPOs). The production file system/LUN remains available during replication and the remote copy is available read-only or read-write during the replication. After the initial synchronization, only changed data is sent over the line.

Fast and easy snap copies

Celerra NSX offers EMC Celerra SnapSure™ software for creating read-only/read-write copies of file systems and iSCSI LUNs. The snap copy enables backups and quick recovery of deleted files, and since the snap is not a mirror operation, you also save disk space and time. It even eases the burden on the system administrator by enabling users to recover their own files and directories.

TimeFinder/FS, available with Symmetrix storage, creates independent copies of the file systems to facilitate backups, application testing, and other site-specific functions. These are full data copies and not simply pointers to the actual data.

Flexible, fast backup and disaster recovery

DART provides multiple backup options, such as:

- Industry-standard Network Data Management Protocol (NDMP v1, v2, v3, and v4) to support NAS-based backup products from the leading vendors for better-than-network speeds with no multi-protocol attribute concerns and no impact on existing network traffic. The EMC-developed NDMP volume backup option provides rapid backups for small file environments.
- High-speed backup and recovery is facilitated via backup-to-disk support over the LAN for remote servers as well as for NDMP clients.
- EMC OnCourse™ facilitates automated policy-driven file transfers that can be used to back up remote files from installed UNIX and Windows servers to a central Celerra repository. OnCourse also permits automatic one-to-many distribution of content from Celerra to distributed servers.

Management flexibility to meet your operational needs

Management and performance monitoring of Celerra NSX is accomplished in a variety of ways, depending on the preference and skill level of the administrator.

1. **Celerra Manager Basic Edition** is a Web-based graphical user interface with extensive availability of wizards that enables an administrator to manage the most common daily administrative tasks, including snapshot scheduling, network and hardware configuration and management of X-Blades, file systems, shares, and call-home configuration.

2. **Celerra Manager Advanced Edition** extends the Basic Edition capabilities as follows:

   - Adds sophisticated monitoring facilities that let you closely monitor specific performance characteristics of the NSX X-Blades and attached Symmetrix or CLARiiON storage; performance, configuration, statistics, logs, and summaries of past configurations of either system can be monitored
   - Permits the management of multiple Celerra NSX clusters
   - Allows manual volume management
   - Provides a GUI to assist in migrating data to Celerra

3. **Microsoft Management Console (MMC)** snap-ins provide a Windows "look and feel" in managing Celerra; for example, a snap-in for managing Celerra user mapping and anti-virus checking.

4. A **command-line interface (CLI)** is present for administrators preferring to work with UNIX-like commands and scripts.

5. The **EMC ControlCenter® management software suite** can discover, monitor, and launch Celerra Manager as part of an enterprise management infrastructure; ControlCenter is also used to manage the back-end storage devices and the interconnecting SAN.

6. Celerra NSX can also be monitored via **Network Management Frameworks** such as CA Unicenter, Tivoli, and HP OpenView via an SNMP Management Information Base (MIB) II interface.

7. **EMC Replication Manager** provides application integration with Exchange and SQL Server and leverages Microsoft Volume Shadowcopy Service for iSCSI snapshots and replicas.

8. **Celerra File Level Retention** provides disk-based WORM functionality.

9. **Celerra FileMover API** allows automated policy-based movement of files between tiers of storage.

10. **Celerra Multi-Path File System (MPFS)** accelerates file access up to thirty times over standard NAS without the need to recode applications.

11. **Celerra Anti-Virus Agent (CAVA)** provides on-demand anti-virus support through tight integration with industry-leading anti-virus vendors, such as Symantec, McAfee, Computer Associates, Trend Micro, and Sophos.

12. **Celerra Event Publishing Agent (CEPA)** provides on-demand, event-driven functionality via tight integration with industry-leading quota management vendors, such as Northern Parklife and NTP Software.

13. **Celerra Quotas** let system administrators allocate disk space on a per-user, per-group, and per-directory tree basis leveraging DART's extensive support for byte, block-level, and directory quotas.

14. **Celerra Automated Volume Management** lets you quickly and painlessly provision file systems by workload in only four clicks.

15. **Celerra Virtual Provisioning** allows file systems and iSCSI LUNs to be logically sized to required capacities, and physically provisioned with less, so storage does not sit idly in a file system or LUN until it is used. Automatic File system Extension and Dynamic iSCSI LUN extension allow the physical allocation to be increased on the fly, as needed.

EMC Global Services delivers results

EMC Global Services delivers results to our customers throughout the IT lifecycle. Strategic storage consulting services delivered by Information Solutions Consulting help companies leverage their information for direct bottom-line impact. In addition to point solutions like the implementation of your Celerra NSX system, EMC Global Services delivers comprehensive storage services for EMC technology—everything from consolidation of your current resources to a strategic shift to EMC networked storage.

EMC Services, winner of the coveted STAR award for mission-critical support for five years, keeps your information available 24/7 with our proactive, pre-emptive customer support. And EMC Global Education drives the value of your investment with a comprehensive portfolio of customer courses. Ask your EMC sales representative about the full spectrum of services from EMC that can benefit your organization.

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Take the next step

For more information on the industry-leading EMC Celerra NSX and how it can transform how your business uses its information assets, contact your EMC sales representative or authorized EMC value-added systems integrator. Or visit our website at www.EMC.com.

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