IBM System Storage N7000 series, Filer and Gateway

Reliable, powerful, expandable modular storage for data center applications and consolidations

Highlights

- Meet growing business needs with a robust and expandable infrastructure designed for nondisruptive expansion to more than 5.7 PB (5,760 TB) storage capacity
- Gain management versatility with simultaneous file serving and block I/O over Ethernet and Fibre Channel storage-area network (SAN) infrastructures
- Help ensure that critical workloads get priority service using FlexShare
- Enable near-continuous operations with support for application-level recovery in minutes, not hours
- Scale SAN and network-attached storage (NAS) to tens of petabytes without disrupting running applications, using Clustered Data ONTAP

In an increasingly demanding and competitive business landscape, effective data management is essential to the success of your business. Employees, partners and customers need access to up-to-date information to work productively, make timely decisions and meet business goals. IT is under pressure to deliver more storage capacity at higher levels of service. Yet critical resources, including staffing, budget, power, cooling and floor space, are often constrained. Storage efficiency becomes the key to keeping pace with this growing environment.

These demands call for enterprise-class storage systems with the flexibility to support changing IT requirements, accommodate continuous data growth, satisfy the application-level service requirements of NAS environments and support SAN infrastructures—all at a low overall cost.

IBM® System Storage® N7000 series systems are designed to help you tackle the challenge of effective data management using virtualization technology and a multiprotocol storage architecture. N7000 series is designed to deliver high-end enterprise storage and data management capabilities with midrange affordability. Built-in serviceability and manageability features help support efforts to increase reliability, simplify and merge in a single-code storage infrastructure and maintenance, and deliver exceptional economy.

N7000 series, like all IBM System Storage N series systems, provides powerful virtualization and thin-provisioning capabilities to help you maximize storage utilization while minimizing the use of power, cooling and floor space. At the same time, you can improve staff productivity with an integrated suite of application-aware manageability software that offers policy-based automation to otherwise manual tasks, improving storage efficiency.

N7000 series can integrate Fibre Channel, SAN, iSCSI SAN, NAS, Fibre Channel over Ethernet (FCoE), primary, nearline, and regulatory compliance data retention and archival storage in a single-code architecture. N7000 series also offers massive expandability to support growth and consolidation. The combination of N series system versatility and simplicity is intended to help you respond quickly to changing business needs.

In addition, N7000 series, also available with a Gateway feature, can help you get the most from your existing storage equipment. You can improve your return on investment while continuing to support different access methods for different business solutions throughout the enterprise. With its Gateway feature, N7000 series is able to support attachment to a broad range of IBM, EMC, Hitachi, Fujitsu and HP storage subsystems, including IBM XIV® Storage System and IBM DS8000®.[1]

Expandability, flexibility and availability for outstanding value

Expandability

N7000 series is designed to meet the massive storage and I/O expandability needs that are critical in large data-center environments. The N7550T system can be configured with 4.8 PB of raw storage capacity using up to 1,200 disk drives. The N7950T system can be configured with 5.7 PB of raw storage capacity using up to 1,440 disk drives.

The N7550T system offers superscalar processor technology, high-bandwidth memory interconnection and high-bandwidth I/O controller designs in single- and dual-controller configurations. The N7950T system offers high-bandwidth controller designs, which can be in an active-active configuration. Each system offers 48 x 4 Gbps and 48 x 8 Gbps Fibre Channel ports, 52 Gigabit Ethernet (GbE) ports standard with the system, and 24 PCIe expansion slots that can accommodate quad-port 4 Gbps Fibre Channel adapter cards and 10 GbE adapter cards. For additional connectivity, N7000 series can expand to a maximum of 128 Fibre Channel ports, 100 Ethernet ports and 72 SAS ports.

Versatility

The N7000 series single-code storage architecture can help eliminate the need to manage separate NAS and SAN storage by providing concurrent support for block and file protocols via Ethernet and Fibre Channel interfaces. With support for Fibre Channel and SATA hard drives, the N7000 product line also has the flexibility to be used for primary and secondary tiered storage.

Storage provisioning can take hours on other storage systems, but with the N series system's thin-provisioning capabilities—provided by FlexVol technology—volumes can be expanded and contracted automatically without IT staff intervention or disruption to applications.

Another feature of the N series Data ONTAP operating system, FlexClone, enables the nearly instant creation of clones without requiring incremental storage. FlexClone can dramatically accelerate test and development cycles for IT projects.

Efficient consolidation

N7000 series is designed to consolidate and serve data for a wide variety of workloads, including mission-critical business applications, technical applications, databases, email, home directories, digital media, backup and recovery, regulatory-compliant data retention, and archiving. The N7550T and N7950T systems support Microsoft Windows, Microsoft Windows Server, Oracle Solaris, IBM AIX®, HP-UX, Macintosh OS and Linux host operating systems, as well as Microsoft Windows Server 2008 Hyper-V and VMware ESX for server virtualization.

Consolidation of dissimilar data workloads can cause poor response times during peak hours of operations. To help address this challenge, N series offers FlexShare quality-of-service software, which is intended to allow you to set and dynamically adjust workload priorities. FlexShare can help ensure that important applications get fast response times.

Continuous operations with application availability
N7000 systems combine hardware and software features to help meet the need for continuous availability. Complementing the high-availability hardware design is the proven reliability of the Data ONTAP operating system and RAID-DP (N series implementation of RAID-6), which provides double-level RAID data protection to help ensure that data is not lost in the event of multiple disk drive failures. In addition, RAID-DP has negligible performance impact. N7000 series also supports simple yet powerful synchronous, semi-synchronous and asynchronous mirroring that can be deployed in one-to-one, one-to-many and many-to-one mirroring configurations.

N7000 series can serve as the foundation for a comprehensive data management solution consisting of hardware, software and services. With an appliance architecture and built-in backup and recovery software, N7000 is designed to address the entire spectrum of data availability challenges while offering value in price, performance and expandability.

Ultimately, what matters is application-level availability, and this is where N series systems excel. Snapshot, a standard feature of Data ONTAP, makes it possible to instantly revert to a previous version of data upon failure or user error. N series Snapshot copies can be created frequently during production because they use only a small amount of incremental storage and have virtually no impact on performance. Host-based SnapManager software integrates Snapshot management with applications designed to help ensure consistent backup images and application-level recovery in just minutes.

Performance
High performance and massive storage capacity are characteristics that make N7000 systems ideal for massive applications and storage consolidation. An N7000 system is designed to complete jobs quickly and handle a large number of users via a powerful, high-bandwidth architecture with expandability to 1,440 disk drives capable of delivering up to 5.7 PB of raw storage capacity. With large cache memory configurations, expandable high-performance I/O, 8 Gbps Fibre Channel SAN support and support for 10 Gbps Ethernet, N7000 series delivers exceptional enterprise-class system performance.

Nearline storage capabilities

N7000 series is well suited for nearline storage configurations. An N7000 system populated with solid-state drive (SSD) flash storage or SAS disk drives that backs up to another N series system populated with nearline-SAS or SATA disk drives offers disk-to-disk backup capabilities that are designed to help fill the price/performance gap between fast but costly primary storage and less costly but slower archival (tape and optical) storage. Utilizing nearline-SAS and SATA disk drive technology, you could achieve near-primary storage performance at near-tape storage costs.

A disk-based, secondary storage device for enterprise applications, N7000 series provides a disk-to-disk environment designed to complement and dramatically improve existing tape backup, archiving and data protection schemes. N7000 accomplishes this by inserting economical and simple-to-use disk-based storage between application storage and tape libraries in a three-tier storage architecture.

This arrangement is designed to provide economical storage and rapid disk-based access to reference data in order to help address business and regulatory requirements. It can serve as a key component in an information lifecycle management process by storing less-critical data on a device where cost and performance fall between primary and tape storage.

Combined with SnapVault technology, N7000 series disk-to-disk backup environments are designed to serve as robust and fully integrated appliances that make backing up and restoring data more rapid and reliable. Backing up directly to an N7000 system in a nearline storage configuration and then to tape can help your organization enhance data protection management, improve primary storage and tape library performance, and reduce backup resource requirements and costs. Two N series systems operating in a disk-to-disk backup scenario are designed to be faster and to consume less application-server CPU processing power than direct backup to tape. SnapVault software can be used to help reduce network bandwidth consumption by supporting incremental block transfers to backup data across a local-area network (LAN) or a wide-area network (WAN). SnapMirror software, which replicates data at high speeds over a LAN or a WAN, is designed to provide high data availability and fast recovery for mission-critical applications.

N series systems using NearStore software can use the deduplication software feature for better storage utilization. Deduplication software enables N series systems to deduplicate stored data at the block level in order to conserve physical disk space when making disk-to-disk copies of primary data. Traditionally when copies of volumes are created, every duplicate data string is also copied, resulting in inefficient use of secondary storage. Deduplication helps eliminate this inefficiency.

Extended innovation using clustered architecture

The Clustered Data ONTAP operating system addresses the challenges of managing growing and dynamic businesses by further extending the innovation of Data ONTAP. This optional, clustered architecture introduced with Data ONTAP 8.2 scales and adapts to the environment's changing needs, reducing risk and cost. Clustered Data ONTAP is designed to help eliminate downtime, enabling operators to service their infrastructures without disrupting access to user data and applications—even during regular business hours.

Proven operational efficiency helps to simplify the overall storage environment and manage the storage infrastructure at scale by automating important processes and increasing productivity. You can add capacity as needed across both SAN and NAS environments—without the disruptive hardware upgrades required by some storage vendors.

Clustered Data ONTAP provides up to 24 storage controllers (or nodes) managed as a single logical pool, so your operations scale even more easily.

Software	
Operating system	Data ONTAP Clustered Data ONTAP*
Operating systems supported	Microsoft Windows, Microsoft Windows Server, Oracle Solaris, IBM AIX, HP-UX, Mac OS and Linux host operating systems, as well as Microsoft Windows Server 2008 Hyper-V, Citrix XenServer and VMware ESX for server virtualization
Software features	See **ibm.com**/systems/storage/network/software for a full list of software features.
Clustered Data ONTAP support	
Cluster nodes†	NAS: Up to 24 cluster nodes SAN: Up to 8 cluster nodes
Cluster data communication interconnect	10 GbE
Cluster capacity	Up to 69 PB
Storage protocols	Fibre Channel, iSCSI, Network File System (NFS), parallel NFS (pNFS), Common Internet File System (CIFS) or Server Message Block (SMB)

Specifications

	N7550T	**N7950T**
Machine type model	2867-C20	2867-E22
Gateway machine type model	2867-C20 (with feature code 9551)	2867-E22 (with feature code 9551)
Controller configuration	Dual (active/active) (CC)	Dual (active/active)
Processors speed and type	2.26 GHz Nehalem quad-core	2.93 GHz Intel 6-core
Number of processors	4	24
Random access memory	96 GB	192 GB‡
Nonvolatile memory	4 GB	8 GB
Integrated I/O ports		
Fibre Channel ports/speed	8 (8 Gbps)	8 (8 Gbps)
SAS ports/speed (requires Fibre Channel 1080)	0 – 8 (6 Gbps)	0 – 24 (6 Gbps)
Ethernet ports/speed	8 (10 Gbps), 4 (1 Gbps)	8 (10 Gbps), 4 (1 Gbps)
Storage scalability		
Maximum number of Fibre Channel loops	10	14
Maximum number of SAS stacks	10	10
Maximum raw capacity§	4,800 TB	5,760 TB
Maximum number of disk drives	1,200	1,440
Maximum volume size	70 TB	100 TB
Maximum number of logical unit numbers (LUNs)	4,096	4,096
Maximum number of SAN hosts	Up to 512 hosts per high-availability pair Up to 24 directly connected servers per high-availability pair	Up to 512 hosts per high-availability pair Up to 24 directly connected servers per high-availability pair
Maximum number of storage enclosures	72	84
Disk expansion units supported	**EXN4000—**Fibre Channel disk storage expansion unit—4 Gbps Fibre Channel: 300 GB, 450 GB, 600 GB hard disk drive (HDD) (15k rpm) **EXN3500****—SAS disk storage (small form factor [SFF]) expansion unit—SAS: 450 GB, 600 GB, 900 GB, 1.2 TB HDD (10k rpm); 200 GB, 400 GB, 800 GB, 1.6 TB solid-state drive (SSD) **EXN3200—**SATA disk storage (HDD) expansion unit—3 TB, 4 TB HDD (7.2k rpm) **EXN3000**††—SAS disk storage expansion unit—SAS: 300 GB, 450 GB, 600 GB HDD (15k rpm); 4 TB nearline SAS, 4 TB nearline SAS self-encryption disk (SED) HDD (7.2k rpm); SATA: 1 TB, 2 TB, 3 TB, 3 TB SED HDD (7.2k rpm); 100 GB SSD, 200 GB SSD **EXN1000**—SATA disk storage expansion unit—SATA: 1 TB, 2 TB HDD (7.2k rpm)	
I/O scalability		
PCIe expansion slots	8	24
PCI-X expansion slots	0	0
Maximum number of Fibre Channel ports	48	128
Maximum number of Ethernet ports	36	100
Maximum number of SAS ports	40	72
Warranty	3 years for hardware and licensed software, customer-replaceable unit (CRU) and onsite service, next business day 9×5, service upgrades available	3 years for hardware and licensed software, CRU and onsite service, next business day 9×5, service upgrades available

Why IBM?

IBM has the proven experience and storage technology to help you improve the efficiency and reliability of your storage infrastructure. Innovative technology, open standards, excellent performance, and a broad portfolio of storage-proven software, hardware and solutions offerings—all backed by IBM with its recognized leadership—are just a few of the reasons why you should consider IBM storage offerings.

For more information

To learn more about IBM System Storage N7000 series systems, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/systems/storage/network

For N7000 series technical specifications, optional I/O expandability and software features, functions and benefits, visit: **ibm.com**/systems/storage/network

For N7000 series interoperability, visit: **ibm.com**/systems/storage/network/interophome.html

Additionally, IBM Global Financing can help you acquire the IT solutions that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize an IT financing solution to suit your business goals, enable effective cash management, and improve your total cost of ownership. IBM Global Financing is your smartest choice to fund critical IT investments and propel your business forward. For more information, visit: **ibm.com**/financing

§ Maximum capacity is derived based on the type, size and number of drives. Maximum capacity and volume size are calculated using Base10 arithmetic (e.g., 1 TB = 1,000,000,000,000 bytes).

** Mixed drive shelves available: 200 GB SSD with 900 GB SAS HDD.

†† Mixed drive shelves available: 200 GB SSD with 2 TB SATA HDD.

[1] Review the IBM N series Interoperability Matrix for storage subsystems supported.

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Actual available storage capacity may be reported for both uncompressed and compressed data and will vary and may be less than stated.

* Clustered Data ONTAP is available as an option. Clustered Data ONTAP only supports dual-node systems.

† A cluster can mix controllers of different models from N7000 series or multiple series (that is, N7000 series and N6000 series)

‡ 192 GB of physical memory; actual memory allocated depends on the Data ONTAP release in use.

Please Recycle

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