

IBM System Storage N7000 Gateway for SAN Storage Environments



Highlights

- **Heterogeneous unified storage environment—Designed to provide unified storage access for multiprotocol, multivendor Storage environments**
- **Storage consolidation—Designed to enable organizations to consolidate UNIX®, Linux®, Windows® and Web workloads with existing SAN storage, thereby helping to increase storage utilization**
- **Utilizing existing SAN infrastructure—Designed to integrate into existing SAN storage environments, helping to optimize investment protection and ROI**
- **Data Management—Designed to provide advanced data management solutions that maximize availability and can help to significantly reduce operational cost**
- **Comprehensive software suite—Designed to provide robust system management, copy services, virtualization technologies and disaster recovery and backup capabilities across all SAN resources**

The challenge: Improving storage utilization and access

As enterprise storage requirements evolved from direct-attached to networked storage, many enterprises made significant investments in multiple storage architectures—DAS, SAN, and NAS—to support the different access methods required by business solutions. The result was often inefficient and under-utilized storage environments. A critical IT management challenge is to optimize the usage of existing storage to improve efficiency and return on investment (ROI) while continuing to support different access methods for different business solutions throughout the enterprise.

File-level usage and distributed enterprise usage of the SAN environment are ways to improve access and usage of storage resources. Many enterprises, however, are not ready to replace their existing storage systems with new, unified ones. Instead, companies with extensive SAN storage networks are

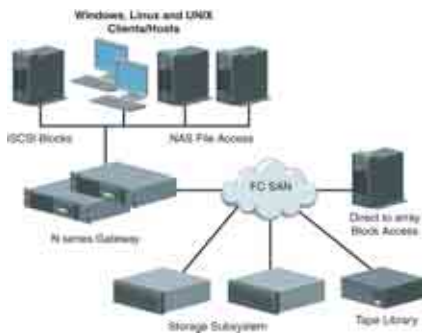


Figure 1) IBM System Storage N7000 Gateway

looking for ways to broaden the use of their infrastructures and achieve a greater return on investment by provisioning SAN capacity for new business solutions that require NAS-shared data access and remote access.

The solution: IBM System Storage N7000 Gateway

The IBM System Storage™ N7000 Gateway product line is a network-based unified storage solution designed to provide Internet Protocol (IP) and Fibre Channel (FC) protocol access to Storage Area Network (SAN) attached heterogeneous storage arrays. The N7000 Gateway can help you leverage the dynamic provisioning capabilities of Data ONTAP® software across your existing Fibre Channel SAN infrastructure to support an expanded set of business applications. The IBM N7000 Gateway is based on the Data ONTAP microkernel operating system, which is

designed to unify block and file storage networking paradigms under a common architecture. The N7000 Gateway is designed to provide a comprehensive suite of advanced data management capabilities to help you consolidate, protect and recover mission-critical data for enterprise applications and users.

The IBM N series Gateway is designed to deliver the performance and capacity to meet access requirements for enterprises of all sizes. N series Gateway systems are intended to deliver industry-leading performance, offer terabytes of managed capacity, and can be configured for simultaneous active/active access with secure failover across two independent systems in a cluster. N7000 Gateways can offer massive SAN and NAS consolidation is now a reality using multiple N7000 Gateway systems and SAN storage systems configured in a scalable SAN infrastructure.

The N7000 Gateway product line supports a broad range of IBM, EMC, Hitachi, Fujitsu and HP storage subsystems, including the IBM Enterprise Storage Server (ESS) series, IBM System Storage DS8000™ and DS4000™ series. Clients with these storage subsystems in their SAN environments can now take advantage of

the N7000 Gateway capabilities to help improve business efficiency and reduce data management complexity.

Bridging LAN and SAN

The N7000 Gateway can be an effective solution to help you increase efficiency and access to existing SAN storage. It can serve as a powerful addition to an existing or planned SAN installation as it acts as the gateway between Fibre Channel and IP networks. It supports the direct interconnection of IP clients with many Fibre Channel attached storage devices. In addition, it is designed to help reduce the amount of direct Fibre Channel connections to servers and clients that require SAN access, resulting in potential cost savings.

Consolidating storage to help increase utilization

The N7000 Gateway is designed to enable new business solutions that require NAS or SAN access to utilize SAN storage. The consolidation of storage enables improved utilization and greater flexibility in planning storage growth. You can use the N7000 Gateway to help you enhance existing SAN solutions through the creation of a consolidated storage infrastructure designed for a broad range of enterprise workloads and allows you the

flexibility to select and easily provision the optimal data access approach for current and future storage needs. The solution is also designed to facilitate your sharing of files by supporting simultaneous access among heterogeneous clients and servers throughout the enterprise while consolidating servers by eliminating the need for standalone or SAN-attached file servers.

Helping to improve investment protection by leveraging existing infrastructure

The N7000 Gateway is designed to integrate into mission-critical, enterprise-class SAN infrastructures. This allows you to leverage your SAN and storage investments by providing new SAN capacity while helping to reduce connectivity requirements. You may gain the advantages of enterprise Fibre Channel storage connectivity without the costs of physically connecting each host to the SAN infrastructure. This helps you optimize storage usage and preserve future scalability.

Supporting low TCO through proven data management

IBM N7000 Gateway solutions are based on Data ONTAP, a highly optimized, scalable and flexible operating system that can integrate into UNIX,

Linux, Windows and Web environments. Data ONTAP is designed to deliver multiprotocol access, scalable performance and flexible data management capabilities while helping you achieve low management complexity and total cost of ownership.

Supporting business continuance through high system availability

The N7000 Gateway is ideal for those wishing to extend the reach of their SANs. The N7000 Gateway incorporates a variety of reliability and availability features designed to support high demand operations. It houses hot swappable, redundant power supplies and fans and supports multipath failover protection and host dual pathing between the unit and its SAN-attached storage device. In addition, the clustering feature between two controllers is designed to help reduce system downtime.

Helping to increase storage utilization with a unified storage architecture

N7000 Gateways unify storage and provide heterogeneous access to SAN resources. The N7000 Gateway supports transport-independent data access using standard network protocols such as CIFS, NFS, HTTP, FTP,

iSCSI and FCP and is intended to provide cost-effective heterogeneous data sharing without compromising security, compatibility or performance using SecureShare® cross-protocol locking.

Storage consolidation using MultiStore® Software enables multidomain server and storage consolidation with simplified tiered management by logically partitioning the network and N series Gateway storage resources.

N7000 Gateways can help optimize system throughput by using SnapMover® Software, which provides a no-copy data migration solution for workload distribution among N series Gateway systems sharing a RAID array, with no or minimal user disruption.

N7000 Gateways are designed to optimize resource utilization by using FlexClone® software to enable near-instantaneous no-copy cloning of flexible volumes for fast multiple-version data replication with substantial storage space savings.

Enhancing enterprise data availability

The N7000 Gateway, combined with Clustered Failover software, is designed to support continuous access to data

by automatically failing over to an additional Gateway appliance. Clustered Failover software can help provide protection against unplanned system outages.

In addition, the Gateway offers equivalent data protection and disaster recovery features and copy services that are also available in N series appliance models.

SyncMirror® software provides increased protection against multiple storage component failures by synchronously replicating mission-critical application data in a local data center environment.

MetroCluster software provides a highly available business continuance solution that enables the customer to quickly and easily resume mission-critical operation at a remote site within a campus or metropolitan area with no data loss and minimal downtime.

Helping to improve data protection

Snapshot™ Technology—Enables near instantaneous, transparent on-disk backup by storing multiple read-only

versions of each data volume. The Snapshot function uses minimal processing overhead, requires minimal disk space, and causes no disruption of service.

SnapRestore® Software—Allows any system to revert to a specified point in time for instant file system or file recovery. Terabytes can be recovered in minutes rather than hours, without going to tape.

SnapMirror® Software—Provides transport independent synchronous, semisynchronous and asynchronous remote heterogeneous replication at high speeds over a LAN, WAN, MAN or SAN for use across a range of solutions, including disaster recovery, replication, backup or testing on a nonproduction system.

SnapVault® Software—Enhances data protection by frequently backing up changed data from multiple IBM N series storage systems or other storage platforms to a common Snapshot file on a central online repository, thereby enabling faster tapeless restores and lowering the cost of data protection.

SnapLock® Enterprise Software—

Provides non-rewritable data permanence storage that enables compliance with government records retention and business records keeping best practices.

Helping to reduce enterprise data management complexity

SnapDrive® Software—Provides host based provisioning, Snapshot consistency and dynamic volume management for simplifying SAN management.

SnapManager® Software—

Provides a comprehensive data management solution for hosting and automating near-instantaneous hot backups and near-online restoration of Microsoft® Exchange and Microsoft SQL environments.

Single Mailbox Recovery

Software—Single mailbox recovery functionality, along with SnapManager for Exchange, enables near-instantaneous, accurate, cost-effective backups and the ability to recover Microsoft Exchange data at any level of granularity—storage group, database, folder, single mailbox, or single message.

Easy to deploy—The N7000 Gateway is designed to integrate into existing UNIX, Linux and Windows environments by utilizing standard naming and authentication services, including native support for Microsoft Active Directory and Kerberos authentication.

Easy to manage and administer—N7000 Gateways with FilerView® technology offer a remote administration solution for open storage networks.

FilerView software can help IT administrators use Web browsers to access consistent, easy-to-use graphical user interfaces for administration tasks. For added security, the SecureAdmin™ software option offers strong encryption for command-line and HTTP-based administration and management sessions.

Operations Manager provides a simple, centralized administration tool that enables comprehensive management of the IBM N series enterprise storage and content delivery infrastructure. With a rich set of capabilities, Operations Manager allows an organization to rapidly deploy, provision and manage a complete enterprise storage network.

IBM System Storage N7000 Gateway at a glance

| | |
|---|--|
| Operating system | Data ONTAP 7 |
| Standard software features | Snapshot, Fast Boot, FlexVol®, telnet, e-mail alerts, NIS, DNS, SNMP, FilerView, FlexShare™, NDMP, antivirus, LDAP |
| Network protocol support | NFS V2/V3/V4 over UDP or TCP, PC NFSD V1/V2 for (PC) NFS client authentication, Microsoft® CIFS, HTTP 1.0, HTTP 1.1 virtual hosts, WebDAV |
| SAN protocol support | Fibre Channel Protocol (FCP), iSCSI; fabric-attached and direct-attached |
| Data availability software | Clustered failover, SyncMirror, MetroCluster |
| Data protection software | SnapRestore, SnapMirror, SnapVault, SnapLock Enterprise, LockVault™ Enterprise |
| Data management software | MultiStore, SnapMover, SnapDrive, SnapManager for Microsoft Exchange, SnapManager for Microsoft SQL Server™, SnapManager for SAP, Single Mailbox Recovery, SnapValidator®, FlexClone |
| Storage management software | Operations Manager, SecureAdmin, Protection Manager™ |
| Hardware features | Full-duplex 10/100/1000Base-T Ethernet onboard console, diagnostic LED/LCD, Remote Management Card standard, redundant hot-plug cooling fans, redundant hot-plug power supplies, Compact Flash, 19" rack-mount enclosure, optional 220 V version is available. |
| RAID support | Dependent on attached storage subsystem |
| Disk storage expansion units supported | Refer to the IBM System Storage N series Gateway Interoperability Matrix at: www-03.ibm.com/servers/storage/nas/interophome.html |

Specifications

| | N7600 | N7600 | N7800 | N7800 |
|--|---------------------------|--|---------------------------|--|
| IBM machine types – models | 2866-G10 | 2866-G20 | 2867-G10 | 2867-G20 |
| Storage configuration | Single storage controller | Dual (active/active) storage controllers | Single storage controller | Dual (active/active) storage controllers |
| Processors | | | | |
| Processor Types | 2.6 GHz AMD Opteron | 2.6 GHz AMD Opteron | 2.6 GHz AMD Opteron | 2.6 GHz AMD Opteron |
| Number of Processors | 2 | 4 | 4 | 8 |
| Max. raw capacity ^a | 420 TB | 420 TB | 504 TB | 504 TB |
| Max. number of LUNs | 672 | 840 | 672 | 1008 |
| Storage array LUN size | 1 to 500 GB | 1 to 500 GB | 1 to 500 GB | 1 to 500 GB |
| Volumes (min./max.) | 2/200 | 2/200 | 2/200 | 2/200 |
| Max. volume size ^a | 16 TB | 16 TB | 16 TB | 16 TB |
| Memory | | | | |
| Random Access memory | 16 GB | 32 GB | 32 GB | 64 GB |
| Nonvolatile memory | 512 MB | 1 GB | 2 GB | 4 GB |
| Integrated I/O | | | | |
| Onboard 2 Gb Fibre Channel ports (fiber) | 8 | 16 | 8 | 16 |
| Onboard GbE ports (copper) | 6 | 12 | 6 | 12 |

I/O expandability

| | N7600-G10 Single storage controller | N7600-G20 Dual storage controller active/active configuration | N7800-G10 Single storage controller | N7800-G20 Dual storage controller active/active configuration |
|--|-------------------------------------|---|-------------------------------------|---|
| PCI Express Expansion Slots | 5 | 10 | 5 | 10 |
| PCI-X Expansion Slots | 3 | 6 | 3 | 6 |
| Maximum number of optional adapters | Not to exceed 8 | Not to exceed 16 | Not to exceed 8 | Not to exceed 16 |
| Quad GbE TOE (copper) adapter | 2 | 4 | 2 | 4 |
| Single 10 GbE TOE (fibre) adapter | 2 | 4 | 2 | 4 |
| Dual GbE (copper or fibre) adapter | 5 | 10 | 5 | 10 |
| Dual iSCSI (copper or fiber) host adapter | 3 | 6 | 3 | 6 |
| Dual 4 Gbps FC Target adapters | 4 | 8 | 4 | 8 |
| Single dual-channel SCSI LVD for tape | 3 | 6 | 3 | 6 |
| Dual 4 Gbps FC HBA for disk | 4 | 8 | 4 | 8 |
| Dual 4 Gbps FC HBA for tape | 3 | 6 | 3 | 6 |

Storage Subsystem Support Specifications

| | |
|------------------------------------|---|
| Storage interface/data rate | PCI-Based Fibre Channel Fabric and Fibre Channel-Arbitrated Loop (FC-AL)/1 to 4 Gb/sec |
| Storage arrays | Please refer to the interoperability matrix for the latest list of storage systems supported at: ibm.com/systems/storage/nas/interophome.html |

Environmental specifications

| | | |
|--|--|--|
| | Dual storage controller Active/active configuration (2866-G20 and 2867-G20) | Single storage controller (2866-G10 and 2867-G10) |
| AC power / max. current | 100 to 240VAC, 22 to 10A (typical)/24A (max.) at 100VAC | 100 to 240VAC, 11 to 5A (typical)/12A (max.) at 100VAC |
| Thermal rating | 6,142 Btu/hr | 3,071 Btu/hr |
| Dimensions | | |
| Weight (max.) | 242 lb (110 kg) | 121 lb (55 kg) |
| Height | 20.8" (52.8 cm) Fits into 12U space | 10.3" (26.2 cm) Fits into 6U space |
| Width | 19" IEC rack-compliant (17", 43.2 cm) | |
| Depth | 23.5" (59.7 cm) without cable management bracket; 29.05" (73.8 cm) with cable management bracket | |
| Operating temperature & relative humidity | 10°C to 40°C (50°F to 104°F) <2,100 m (<7,000') elevation; 10°C to 35°C (50°F to 95°F) <3,000 m (<10,000') elevation; 20% to 80% relative humidity, non-condensing | |
| Non-operating temperature & relative humidity | 20°C to 25°C (68°F to 77°F) -20°C to 65°C (-4°F to 149°F); 8% to 95% relative humidity, non-condensing, in original container | |
| Operating acoustic noise | 56.5 dBA sound pressure (LpA) at normal operating conditions (at 22°C and at sea level) | |
| Minimum cabinet clearances | 1.85" (4.7 cm) for bezel; 3" (7.6 cm) for cable radius | |
| Minimum service clearances | 25" (63.5 cm) front; 30" (76 cm) rear | |
| Maximum altitude | 3050 m (10,000 ft.) | |

Regulations

| | |
|--------------------------|---|
| Filer safety | EN 60950:2002, CE, CSA 60950 and NRTL (UL) CB (all national deviations), EN60825-1:1994, IRAM, GOST-R |
| Disk shelf safety | UL/C-UL; CE |
| Emissions | FCC Class A, EN 55022:1998, EN 61000-3-2, EN 61000-3-3, CE, BSMI, AS/NZ 3548, VCCI |
| Immunity | EN 55024:1998 |

N7000 series tape drive support (refer to interoperability matrix on IBM website)

N7000 Gateway supported backup methods

| | |
|---|---|
| Disk-based backup | SnapVault, SnapMirror |
| Host-based backup | NDMP/NFS/CIFS/iSCSI |
| GbE-attached tape support | ibm.com /storage/nas, refer to System Storage N series interoperability matrix |
| Direct-attached tape support | ibm.com /storage/nas, refer to System Storage N series interoperability matrix |
| SAN-attached tape support | ibm.com /storage/nas, refer to System Storage N series interoperability matrix |
| iSCSI initiator, IP fabric and host-attached support | ibm.com /storage/nas, refer to System Storage N series interoperability matrix |

Storage Subsystem Specifications

| | |
|---|---|
| Storage interface/Data rate | PCI-Based Fibre Channel Fabric and Fibre Channel-Arbitrated Loop (FC-AL)/1 to 2 Gbps. 4 Gbps available on V6030 and V6070. |
| Storage arrays supported | ibm.com /storage/nas, refer to System Storage N7000 Gateway Interoperability Matrix |
| Storage array SAN connectivity SAN vendor support | ibm.com /storage/nas, refer to System Storage N7000 Gateway Interoperability Matrix |

For more information

Contact your IBM representative or
IBM Business Partner or visit:

ibm.com/storage/nas/



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MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.

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

