



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
- **Utilizing existing SAN infrastructure**—Designed to integrate into existing SAN storage environments, helping to optimize investment protection and ROI
- **Versatile**—Single, integrated architecture designed to support concurrent block I/O and file serving over Ethernet and Fibre Channel SAN infrastructures
- **Data management**—Designed to provide advanced data management solutions that maximize availability and can help to reduce operational cost significantly
- **Storage consolidation**—Designed to enable organizations to consolidate UNIX®, Linux®, Windows® and Web workloads with existing SAN storage, thereby helping to increase storage utilization
- **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—direct-attached storage (DAS), storage area network (SAN) and network-attached storage (NAS)—to support the different access methods required by business solutions. The result was often inefficient and underutilized storage environments. A critical IT management challenge is to optimize the use 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 use 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 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 requiring FCP, iSCSI or NAS 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 SAN attached heterogeneous storage arrays. The N7000 Gateway can help you make the most of 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.

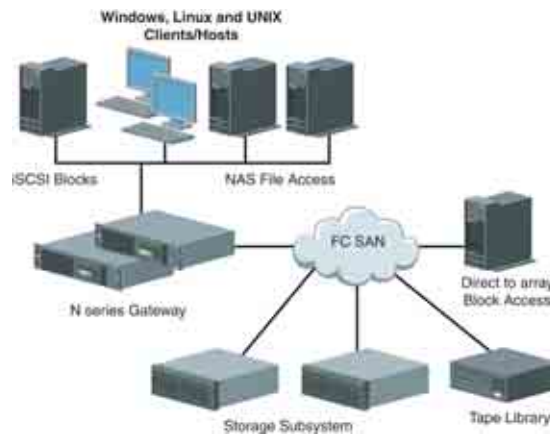


Figure 1) IBM System Storage N7000 Gateway

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 be configured for simultaneous active/active access with secure failover across two independent systems in a cluster. N7000 Gateways that can offer massive SAN and NAS consolidation are now a reality using multiple N7000 Gateway systems and SAN storage systems configured in a scalable SAN infrastructure.

The N7000 Gateway product line supports the attachment to both N series EXN1000 and EXN4000 disk storage expansion units, as well as a broad range of IBM, EMC, Hitachi, Fujitsu, 3PAR 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

An 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 offers 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 stand-alone 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 enables you to make the most of your SAN and storage investments by providing new SAN capacity while helping to reduce connectivity requirements.

You could 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-instant 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-instant, 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, semi-synchronous 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 tape-less 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-instant 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-instant, 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 enables an organization to rapidly deploy, provision and manage a complete enterprise storage network.

Specifications				
	N7700	N7700	N7900	N7900
	2866-G11	2866-G21	2867-G11	2867-G21
Machine type model	Single	Dual (active/active)	Single	Dual (active/active)
Controller configuration	2.6 GHz AMD™ dual-core	2.6 GHz AMD dual-core	2.6 GHz AMD dual-core	2.6 GHz AMD dual-core
Processors speed and type	2	4	4	8
Number of processors	16 GB	32 GB	32 GB	64 GB
Random access memory	Standard integrated I/O ports			
Fibre Channel ports/speed	8 (4-Gbps)	16 (4-Gbps)	8 (4-Gbps)	16 (4-Gbps)
Ethernet ports/speed	6 (1-Gbps)	12 (1-Gbps)	6 (1-Gbps)	12 (1-Gbps)
Storage scalability				
Maximum raw capacity ¹	840 TB	840 TB	1176 TB	1176 TB
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	840	840	1176	1176
I/O scalability				
PCI-Express (PCI-e) expansion slots	5	10	5	10
PCI-x expansion slots	3	6	3	6
Maximum number FC ports	28	56	28	56
Maximum number of Ethernet ports	26	52	26	52

Specifications				
	N7600	N7600	N7800	N7800
	2866-G10	2866-G20	2867-G10	2867-G20
Machine type model				
Controller configuration	Single	Dual (active/active)	Single	Dual (active/active)
Processors speed and type	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
Random access memory	16 GB	32 GB	32 GB	64 GB
Standard integrated I/O ports				
Fibre Channel ports/speed	8 (2-Gbps)	16 (2-Gbps)	8 (2-Gbps)	16 (2-Gbps)
Ethernet ports/speed	6 (1-Gbps)	12 (1-Gbps)	6 (1-Gbps)	12 (1-Gbps)
Storage scalability				
Maximum raw capacity ¹	840 TB	840 TB	1008 TB	1008 TB
Maximum volume size	16 TB	16 TB	16 TB	16 TB
Maximum number of volumes/LUNs	840	840	1008	1008
I/O scalability				
PCI-Express (PCI-e) expansion slots	5	10	5	10
PCI-x expansion slots	3	6	3	6
Maximum number FC ports	28	56	28	56
Maximum number of Ethernet ports	26	52	26	52
Disk Expansion Units Supported	EXN4000 - 4 Gbps Fibre Channel Disk Storage Expansion Unit EXN1000 - SATA Disk Storage Expansion EXN2000 - FC Storage Expansion Unit (Legacy)			

Software

Operating system Data ONTAP

Operating systems supported Windows 2000, Windows Server® 2003, Windows XP, Linux, Sun Solaris, IBM AIX®, HP-UX, Mac OS, VMware ESX

Software features

Standard

Snapshot
Fast Boot
NIS
DNS
FileView
FlexVol®
FlexShare™
Disk Sanitization
SecureAdmin
Network Data Management Protocol (NDMP)

Licensed

CIFS
NFS
HTTP
FTP
iSCSI
FCP
FlexCache™
FlexClone
FlexScale
MultiStore
Clustered Failover
SnapMirror
SyncMirror
SnapRestore
Single Mailbox Recovery
SnapVault
SnapMover
NearStore®
Advanced Single Instance Storage
SnapValidator®
SnapLock
MetroCluster
Manageability Software
Application Suite
 SnapManager for Microsoft Exchange
 SnapManager for Microsoft SQL Server
 SnapManager for Microsoft Office SharePoint
 SnapManager for Oracle
 SnapManager for SAP
Server Suite
 SnapDrive
 Virtual File Manager™— Enterprise Edition
 Virtual File Manager—Migration Edition
Storage Suite
 Protection Manager
 Provisioning Manager
 File Storage Resource Manager
 Operations Manager

See ibm.com/storage/network/n7000/gateway/features.html for an overview of the N7000 series software features, functions and benefits

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 N7700 Gateway and N7900 Gateway
------------------------------------	--

Storage arrays supported	ibm.com/storage/network , refer to System Storage N series Gateway Interoperability Matrix
---------------------------------	---

Storage array SAN connectivity SAN vendor support	ibm.com/storage/network , refer to System Storage N series Gateway Interoperability Matrix
---	---

For more information

Contact your IBM representative or IBM Business Partner or visit:

ibm.com/storage/network

For N7000 series Gateway technical specifications and optional adapter cards available, please visit:

ibm.com/storage/network/n7000/gateway

For N7000 series interoperability and tape drive support visit:

ibm.com/systems/storage/network/interophome.html

IBM is not responsible for the performance or interoperability of any non-IBM products discussed herein. Performance data for IBM and non-IBM products and services contained in this document was derived under specific operating and environmental conditions. The actual results obtained by any party implementing such products or services will depend on a large number of factors specific to such party's operating environment and may vary significantly. IBM makes no representation that these results can be expected or obtained in any implementation of any such products or services.

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.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY, EITHER EXPRESSED OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements (e.g., IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided.

References in this document to IBM products, programs or services do not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM program or product in this document is not intended to state or imply that only that program may be used. Any functionally equivalent program or product that does not infringe IBM's intellectual property rights may be used instead. It is the user's responsibility to evaluate and verify the operation of any non-IBM product, program or service.

¹ Max. capacity is derived based on the type, size, and number of the drives. Max. capacity and volume size are calculated using Base 10 arithmetic (i.e., 1 TB = 1,000,000,000,000 bytes).



© Copyright IBM Corporation 2008

IBM Systems and Technology Group
Route 100
Somers, NY 10589

Produced in the United States
May 2008
All Rights Reserved

IBM, the IBM logo, AIX, DS4000, DS8000, Enterprise Storage Server and System Storage are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries or both.

Data ONTAP, FileView, FlexCache, FlexClone, FlexShare, FlexVol, MultiStore, NearStore, RAID-DP, SecureAdmin, SecureShare, SnapDrive, SnapLock, SnapManager, SnapMirror, SnapMover, SnapRestore, Snapshot, SnapValidator, SnapVault, SyncMirror and VFM Virtual File Manager are trademarks or registered trademarks of NetApp, Inc. in the U.S. and other countries.

Microsoft, Active Directory, SharePoint, SQL Server, Windows and Windows Server are trademarks or registered trademarks of Microsoft Corporation in the United States, other countries or both.

Sun and Solaris are trademarks of Sun Microsystems, Inc. in the United States, other countries or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries or both.

Other company, product and service names may be trademarks or service marks of others.

This document could include technical inaccuracies or typographical errors. IBM may make changes, improvements or alterations to the products, programs and services described in this document, including termination of such products, programs and services, at any time and without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. The information contained in this document is current as of the initial date of publication only and is subject to change without notice. IBM shall have no responsibility to update such information.