

## IBM System Storage N5000 Gateway for SAN Storage Environments



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### Highlights

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- **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) yet continue 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 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 N5000 Gateway

The IBM System Storage™ N5000 Gateway is a network-based solution designed to provide heterogeneous access to Fibre Channel attached storage arrays. The 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 N5000 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 N5000 Gateway features a comprehensive suite of advanced data management capabilities to help you consolidate, protect, and recover mission-critical data for enterprise applications and users.

The N5000 Gateway is designed to deliver terabytes of managed capacity to help address access requirements for enterprises of all sizes. N5000 Gateway systems can be configured for simultaneous active/active access with secure failover across two independent systems in a cluster. SAN and NAS consolidation is now a possibility, using multiple N5000 Gateway

systems and SAN storage systems configured in a scalable SAN infrastructure.

The N5000 Gateway also supports a wide range of IBM, including the IBM System Storage DS8000™ series and DS4000™ series, EMC, Hitachi, Fujitsu and HP StorageWorks XP series. These enterprise-class and modular storage systems support diverse business applications across the enterprise and provide highly scalable solutions. Customers with these storage subsystems in their SAN environments can now take advantage of the N5000 Gateway capabilities to dramatically improve business efficiency and reduce data management complexity.

### Bridging LAN and SAN

The N5000 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 allows IP clients to be directly interconnected 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.



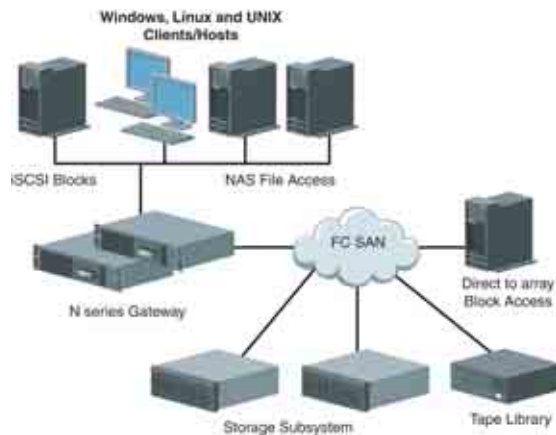


Figure 1) IBM System Storage N5000 Gateway  
 Designed to improve consolidation by extending SAN functionality with data access and data management functionality.

**Consolidating storage to help increase utilization**

The N5000 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 N5000 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 N5000 Gateway is designed to integrate into mission-critical, enterprise-class SAN infrastructures. This allows you to deliver NAS or file I/O as well as block I/O, while dramatically increasing utilization of your infrastructure. Companies can gain the advantages of enterprise Fibre Channel storage connectivity without the costs of physically connecting each host to

the SAN infrastructure. This can help you optimize storage usage and preserve future scalability.

**Helping to reduce TCO through proven data management**

IBM N5000 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 N5000 Gateway is a good value for those wishing to extend the reach of their SANs. The 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 gateway controllers is designed to help reduce system downtime.

**Helping to increase storage utilization by providing a unified storage architecture**

N5000 Gateways unify storage and provide heterogeneous access to SAN resources. The N5000 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 multi-domain server and storage consolidation with simplified tiered management by logically partitioning the network and N series Gateway storage resources.

N5000 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.

N5000 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.

**Storage Consolidation using**

**MultiStore Software**—Enables multi-domain server and storage consolidation with simplified tiered management by logically partitioning the network and N series Gateway storage resources.

**Optimized System Throughput using SnapMover Software**—

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.

**Optimized Resource Utilization using FlexClone Software**—Enables

near instantaneous no-copy cloning of flexible volumes for fast multiple-version data replication with substantial storage space savings.

**Enhancing enterprise data availability**

The N5000 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.

**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, 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 tapeless restores and lowering the cost of data protection.

**SnapLock® Enterprise Software**—Provides nonrewritable 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 N5000 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**—N5000 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.

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## IBM System Storage N5000 Gateway at a glance

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<b>Operating system</b>	Data ONTAP 7
<b>Standard software features</b>	Snapshot, Fast Boot, FlexVol®, telnet, e-mail alerts, NIS, DNS, SNMP, FilerView, FlexShare™, NDMP, antivirus, LDAP
<b>Network protocol support</b>	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
<b>SAN protocol support</b>	Fibre Channel Protocol (FCP), iSCSI; fabric-attached and direct-attached
<b>Data availability software</b>	Clustered failover, SyncMirror, MetroCluster
<b>Data protection software</b>	SnapRestore, SnapMirror, SnapVault, SnapLock Enterprise, LockVault™ Enterprise
<b>Data management software</b>	MultiStore, SnapMover, SnapDrive, SnapManager for Microsoft Exchange, SnapManager for Microsoft SQL Server™, SnapManager for SAP, Single Mailbox Recovery, SnapValidator®, FlexClone
<b>Storage management software</b>	Operations Manager, SecureAdmin, Protection Manager™
<b>Hardware features</b>	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.
<b>RAID support</b>	Dependent on attached storage subsystem
<b>Disk storage expansion units supported</b>	Refer to the IBM System Storage N series Gateway Interoperability Matrix at: <a href="http://ibm.com/servers/storage/nas/interophome.html">ibm.com/servers/storage/nas/interophome.html</a>

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## Specifications

	N5200	N5200	N5500	N5500
IBM machine types – models	2864-G10	2864-G20	2865-G10	2865-G20
Storage configuration	Single storage controller	Dual (active/active) storage controllers	Single storage controller	Dual (active/active) storage controllers
<b>Processors</b>				
Processors type	Intel® 2.8 GHz Xeon®	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon	Intel 2.8 GHz Xeon
Number of processors	1	2	2	4
<b>Memory</b>				
Random Access memory	2 GB	4 GB	4 GB	8 GB
Nonvolatile memory	512 MB	1 GB	512 MB	1 GB
<b>Integrated I/O</b>				
Onboard 10/100/1000 Ethernet ports	4	8	4	8
Onboard 2 Gbps Fibre Channel ports (configurable as storage-attached initiator or host-attached target)	4	8	4	8
Max. raw storage capacity	84 TB	84 TB	96 TB	96 TB
Max. number of – Logical Units (LUNs) on back-end disk storage array	168	168	336	336
Max. volume size	16 TB	16 TB	16 TB	16 TB

Note: The capacity limits specified here are as seen from N series Gateway system perspective. Use specific storage subsystem vendor definition for terabytes to determine corresponding raw storage.

## I/O expandability

	N5200-G10 Single storage controller	N5200-G20 Dual storage controller active/active configuration	N5500-G10 Single storage controller	N5500-G20 Dual storage controller active/active configuration
<b>PCI-X expansion slots</b>	3	6	3	6
<b>Maximum number of optional adapters</b>	3	6	3	6
<ul style="list-style-type: none"> <li>• Dual-port FC HBA for disk (only for A20 models)</li> <li>• Dual-port GbE iSCSI TOE (copper)</li> <li>• Dual-port GbE iSCSI TOE (fibre)</li> <li>• Single dual-channel SCSI LVD for tape</li> <li>• Dual-port MetroCluster HBA</li> <li>• Dual-port 4 Gbps FC HBA</li> <li>• Dual-port GbE (copper)</li> <li>• Dual-port 2 Gbps FC disk adapters</li> <li>• Single-Port 10 GbE TOE NIC</li> <li>• Quad-port 4 Gbps FC HBA for Disk</li> <li>• Dual-port FC HBA for SnapMirror over Fibre Channel</li> </ul>				

## Specifications

	N5300	N5300	N5600	N5600
IBM machine types – models	2869-G10	2869-G20	2868-G10	2868-G20
Storage configuration	Single storage controller	Dual (active/active) storage controllers	Single storage controller	Dual (active/active) storage controllers
<b>Processors</b>				
Processors type	AMD 1.8 GHz Single Core 64-bit Opteron	AMD 1.8 GHz Single Core 64-bit Opteron	AMD 1.8 GHz Dual Core 64-bit Opteron	AMD 1.8 GHz Dual Core 64-bit Opteron
Number of processors	2	4	2	4
<b>Memory</b>				
Random Access memory	4 GB	8 GB	8 GB	16 GB
Nonvolatile memory	512 MB	1 GB	512 MB	1 GB
<b>Integrated I/O</b>				
Onboard 10/100/1000 Ethernet ports	4	8	4	8
Onboard 4 Gbps Fibre Channel ports (configurable as storage-attached initiator or host-attached target)	4	8	4	8
Max. raw storage capacity	126 TB	126 TB	252 TB	252 TB
Max. number of – Logical Units (LUNs) on back-end disk storage array	252	252	504	504

Note: The capacity limits specified here are as seen from N series Gateway system perspective. Use specific storage subsystem vendor definition for terabytes to determine corresponding raw storage.

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## I/O expandability

	N5300-G10 Single storage controller	N5300-G20 Dual storage controller active/active configuration	N5600-G10 Single storage controller	N5600-G20 Dual storage controller active/active configuration
<b>PCI-e expansion slots</b>	3	6	3	6
<b>Maximum number of optional adapters</b>	3	6	3	6
<ul style="list-style-type: none"><li>• Dual-port 4 Gbps FC HBA for disk attachment</li><li>• Dual-port 4 Gbps FCP Target adapter</li><li>• Dual-port 4 Gbps FC HBA—Tape</li><li>• Dual-port Gigabit Ethernet (GbE) adapter (copper)</li><li>• Dual-port GbE adapter (fibre)</li><li>• Dual-port GbE iSCSI Target adapter (copper)</li><li>• Dual-port GbE iSCSI Target adapter (fibre)</li><li>• Quad-port GbE TOE NIC (copper)</li><li>• Quad-port GbE NIC (copper)</li><li>• Dual-port 10 Gbps NIC Fiber</li><li>• Dual-Port FC HBA for SnapMirror over Fibre Channel</li></ul>				

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## Storage Subsystem Support Specifications

<b>Storage Interface/Data Rate</b>	PCI-Based Fibre Channel Fabric and Fibre Channel-Arbitrated Loop (FC-AL)/1 to 4 Gb/sec
<b>Storage Arrays</b>	Refer to the IBM System Storage N series Gateway Interoperability Matrix at: <a href="http://ibm.com/servers/storage/nas/interophome.html">ibm.com/servers/storage/nas/interophome.html</a>

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## Environmental specifications

	Dual storage controller Active/active configuration (2864-G20, 2865-G20, 2868-G20, and 2869-G20)	Single storage controller (2864-G10, 2865-G10, 2868-G10, and 2869-G10)
<b>AC power/max. current</b>	88 to 246/19 to 6.4A	88 to 246VAC/9.5 to 3.2A
<b>Thermal rating</b>	1706 Btu/hr	853 Btu/hr
<b>Weight (max.)</b>	68 kg (150 lb)	34 kg (75 lb)
<b>Height</b>	26 cm (10.6") 6U EIA	13 cm (5.12") 3U EIA
<b>Width</b>	44.9 cm (17.7")	
<b>Depth</b>	61 cm (24") without cable management tray 76.2 cm (30") with cable management tray	
<b>Operating temperature maximum range</b>	10°C to 40°C (50°F to 104°F)	
<b>Recommended operating temperature range</b>	20°C to 25°C (68°F to 77°F)	
<b>Non-operating temperature range</b>	-40°C to 65°C (-40°F to 149°F)	
<b>Non-operating relative humidity</b>	5% to 95% relative humidity non-condensing	
<b>Recommended operating temperature relative humidity range</b>	40% to 55% non-condensing	
<b>Operating acoustic noise</b>	56.4 dBA @ 1m at 23°C, 5.64 bels @ 23°C	
<b>Min. cabinet clearances</b>	25.4 cm (10") in front, 30.5 cm (12") in rear	
<b>Min. service clearances</b>	76.2 cm (30") in front, 76.2 cm (30") in rear	
<b>Maximum altitude</b>	3050 m (10,000 ft.)	

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## Regulations

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

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N5000 series tape drive support refer to interoperability matrix at:

[ibm.com/servers/storage/nas/interophome.html](http://ibm.com/servers/storage/nas/interophome.html)

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### **N5000 series supported backup methods**

<b>Disk-based backup</b>	SnapVault, SnapMirror
<b>Host-based backup</b>	NDMP/NFS/CIFS/iSCSI
<b>GbE-attached tape support</b>	<a href="http://ibm.com/storage/nas">ibm.com/storage/nas</a> , refer to System Storage N series interoperability matrix
<b>Direct-attached tape support</b>	<a href="http://ibm.com/storage/nas">ibm.com/storage/nas</a> , refer to System Storage N series interoperability matrix
<b>SAN-attached tape support</b>	<a href="http://ibm.com/storage/nas">ibm.com/storage/nas</a> , refer to System Storage N series interoperability matrix
<b>iSCSI initiator, IP fabric and host-attached support</b>	<a href="http://ibm.com/storage/nas">ibm.com/storage/nas</a> , refer to System Storage N series interoperability matrix

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## For more information

Contact your IBM representative or IBM Business Partner or visit:

[ibm.com/storage/nas/](http://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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