IBM

IBM® System Storage™ N series Solution

IBM N series delivers powerful data center proven storage solutions which simplify complex IT environments. Designed to support storage needs across the enterprise, from large data centers to small workgroups or branch offices, N series industry-leading products make data center management scalable, flexible, and available.

Resources

For N series products, events, training, and contact information, please visit the N series community

www.netapp.com/ibmnseries

IBM

Proven. Adept. Efficient.

Storage Efficiency
- Server Virtualization
- Desktop Virtualization
- File Server Consolidation
- Integrated Data Protection

Proven IBM N series storage-efficiency software tools help you maximize storage resources within your existing infrastructure. Utilizing Deduplication, FlexVol, FlexClone, and other available features will greatly decrease physical demands on disk storage, power & cooling, and real-estate in any IT infrastructure.

Storage Efficiency Calculator for IBM® N series

Your Customized Results Here

1. Select features to compare production storage space savings.

- ☑ Thin provisioning
- ☑ Double disk failure protection
- ☑ Deduplication
- ☑ Snapshot copies
- ☑ Dev/Test clones

3. See your savings multiply across your storage tiers.
Click here for a full report on how your savings from production storage extend across DR and archival storage copies.

Total Storage Savings

59%
482 TB
$ 4,818,000

Get Full Report

2.
Production Storage
(does not include DR or Archival Data)

Production Storage Capacity Saving: **59% 219 TB**
Power & Cooling Savings: **$ 32,134**
Total Dollars Saved: **$ 2,190,00**

⚠ Performance Impact

Traditional Storage Requirements
370 TB

N series Requirements
151 TB

- ● Overprovisioned Storage
- ● Disk Failure Protection
- ● Application Storage
- ● Snapshot Copies
- ● Dev/Test Storage

Storage Efficiency

IBM N series solutions are easy to manage, quick to deploy, and offer increased availability with fewer IT resource requirements. N series solutions dramatically lower lifetime total cost of ownership (TCO). Where other solutions try to manage complexity, N series solutions simply eliminate it.

Data Growth is Inevitable.

IT budgets are flat but data storage demands are constantly growing. As this data grows often in storage 'islands', enterprises must have the ability to manage the growth and lower the costs associated with maintaining legacy storage equipment. While virtualized servers and applications reduce server use, they place greater demand on storage use.

IBM N series products are designed to reach never-before-seen levels of efficiency when storing this data. N series solutions offer Unified Storage Architecture. The term "unified" refers to a family of storage systems that simultaneously supports storage area network (SAN), network attached storage (NAS), and iSCSI (internet SCSI) across many operating environments including VMware,® Microsoft® Windows, and Unix. With IBM N series storage systems you can realize numerous benefits through this efficiency including:
- Store the maximum amount of data for the lowest possible cost
- Retain data on disk for longer periods of time
- Reduce data center power, cooling, and space costs

IBM N series simplifies enterprise storage environments, maximizes enterprise storage resources, scales to meet growth environments, and provides the best investment protection for the lowest overall cost. IBM offers a solution that is uniquely capable of matching and integrating the pieces of the storage puzzle to fully realize the potential of all enterprise data storage investments, assets, and people.

Key Features

Unified Storage Architecture: Create single, end-to-end foundation for dynamic data management. The IBM N series unified storage architecture enables the creation of a common storage pool that can be networked and shared across a diverse set of applications with a common set of management processes. This offers you the ability to scale from small to very large storage capacity without compromising application performance or service levels.

Primary and Secondary Storage Options: IBM N series offers scalable, high-performance, and highly available storage solutions (with 99.999% data availability*). A modular architecture and powerful virtualization capabilities provides a "right-sized" pay-as-you-grow advantage while promoting optimal hardware and management resource utilization and flexible provisioning yielding excellent ROI benefits.

Non-disruptive Storage Capacity Expansion: Because IBM N series efficiently integrates with RAID, disk optimization, and volume management, data volumes may be enlarged or shrunk dynamically without down time or any re-alignment of data as would be necessary in typical RAID environments.

Instant Backup & Recovery: N series systems enable you to instantly make a copy of an entire data volume. Snapshot™ technology provides you with automated, near-instantaneous backups with no impact to users, more recovery points, perform data recovery in seconds and verifiable backups. SnapRestore® provides administrators with the means to revert an entire data volume back to a previous point-in-time within seconds and therefore full-volume-level recovery.

IBM N series Value
- Achieve up to 50% lower capacity requirements without sacrificing performance or resiliency
- Achieve significant improvement in storage utilization
- Obtain up to 50% or greater reduction in power, cooling, and space requirements
- Manage twice as much data without increasing personnel
- Maximize the value of existing storage systems

While N series delivers unparalleled Storage Efficiency across the data center, the benefits are most dramatic when deployed in the following environments: Server and Desktop Virtualization, File Server Consolidation, and Integrated Data Protection.

Server and Desktop Virtualization Solutions

Server Virtualization

IBM server virtualization solutions help improve IT resource utilization, increase availability of your mission-critical applications, and enable a faster response to business needs.

Using Virtualization to Provide End-to-End Storage Efficiencies.

Uncertain economic times can cause data center managers to reevaluate their budgets and reduce overall IT spending. At the same time, environmental responsibility seems to be top-of-mind for facilities managers, who are concerned with the cost and availability of power, cooling, and space required by today's IT infrastructure. Data proliferation is a serious concern with system administrators affecting both primary and secondary storage systems. IBM System Storage N series virtualization solutions can facilitate companies achieving significant storage efficiencies. Storage efficiency enables you to store the maximum amount of data in the smallest possible space (and at a low overall cost).

N series systems are designed to solve pain points at the storage layer to provide you with increased business-level value, including:
- Energy management can provide significant cost and space savings for both your servers and storage environments
- Consolidation with simplified integration and on-the-fly scalability effectively support your growing business needs
- System management tools help you to efficiently store, manage, protect, and retain your data
- Business continuity and HA help you stay up and running
- Data security helps keep your business safe and compliant

Key Features

Reduce Storage Costs: IBM N series Snapshot™ technology can be used as a storage efficiency feature available on disk-based open systems enterprise storage arrays. Snapshots help system administrators to create many point-in-time copies of entire data volumes that consume only a fraction of the space. The extensive suite of virtualization tools help effectively provision primary storage, manage test and development clone copies, reduce the size of point-in-time backup copies, replicate these copies across LANs and WANs, and reduce overall volume requirements by eliminating redundant data blocks.

Thin Provisioning to Combat the Inefficiencies of Over Provisioning: N series FlexVol® technology enables you to create flexible volumes that appear to be a certain size but are in reality much smaller physically. This creates substantial improvements in storage provisioning, utilization, and volume sizing. Bottom-line impact of using FlexVol is the reduction in physically allocated storage. Benefits include budget savings in data center space, power, heat, and cooling requirements.

Reducing Capacity Requirements for Test and Development Copies: With N series FlexClone® software you can improve storage efficiency in applications in which temporary, writable copies of data volumes are needed. FlexClone technology is designed to enable multiple, instant data set clones with reduced storage overhead.

Create a virtual copy of the primary dataset and store only the data changes between a parent volume and a clone! All unchanged data remains on primary storage and is utilized by both the primary application and the secondary clone copy.

Reduced Data Redundancy with N series Deduplication: N series deduplication divides newly stored data objects into small blocks. Each block of data has a digital "signature", which is compared to all other signatures in the data volume. If an exact block match exists, the deduplicate block is discarded and its disk space is reclaimed. Deduplication can be implemented across a wide variety of application and file types, including data backup, data archiving, and unstructured data volumes. By implementing deduplication, some customers have reclaimed up to 95% of their storage space.
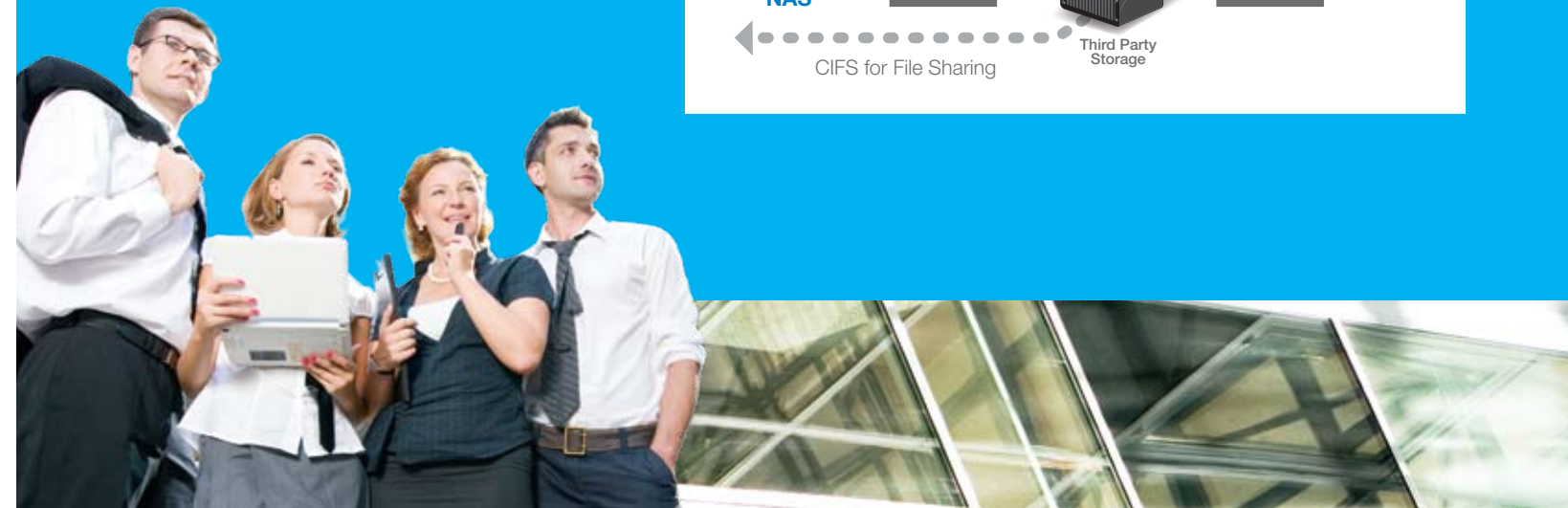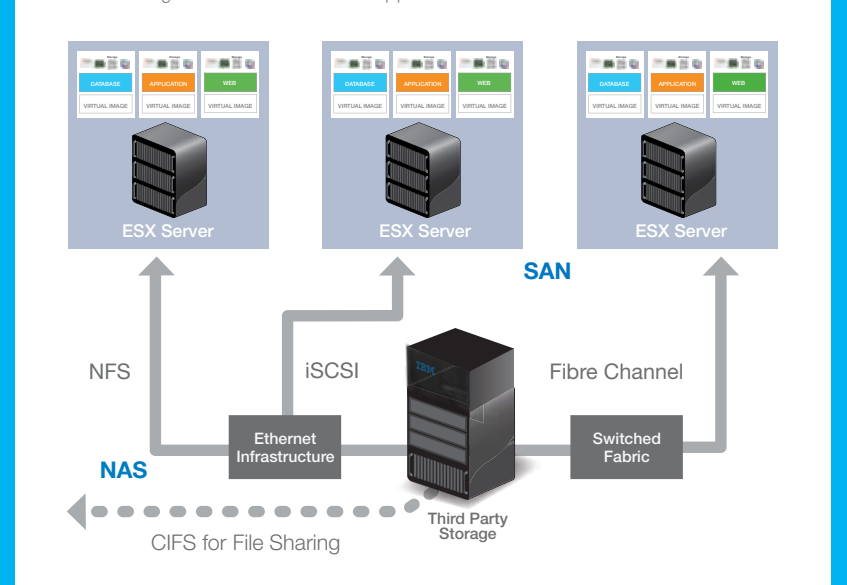
Virtualization on Third Party Storage via N series Gateways: IBM N series Gateway solutions are designed to help apply virtualization to non N series storage. The N series Gateway is intended to enable unification of block and file (NAS, FCP SAN, and IP SAN) storage networking paradigms under a common architecture and virtualization of an entire storage infrastructure under one interface. An IBM N series Gateway solution can help organizations:
- Transform existing heterogeneous multivendor storage systems into a single storage pool
- Simplify storage provisioning and management with FlexVol
- Snapshot and SnapVault software dramatically reduce backup time, space, and cost
- Use SnapMirror data replication for disaster recovery

With IBM System x, IBM N series storage, and virtualization software, you can manage your data center as a flexible environment to meet business needs, rather than as a collection of hardware and software entities. You can reduce the storage required in your production, backup, virtual desktop, and Disaster Recovery by at least 50% while scaling your virtualized environment to leverage your current IT infrastructure.

Unified Storage with Multi Protocol Support

ESX Server   ESX Server   ESX Server

SAN

NFS   iSCSI   Fibre Channel

NAS

Ethernet Infrastructure   Switched Fabric

CIFS for File Sharing   Third Party Storage

Server and Desktop Virtualization Solutions

Server Virtualization *(cont.)*

IBM N series Value

Storage Efficiency: Reduce your data center footprint and significantly save on power, cooling, and space to streamline IT operations in virtualized environments

Infrastructure Flexibility: Embrace N series dynamic and flexible architecture for a variety of supported protocols as well as instant cloning and provisioning

Data Protection: Minimize the chance of data loss in virtualized environments by simplifying backup and delivering affordable disaster recovery

Desktop Virtualization

IBM Desktop Virtualization solution helps simplify desktop management, lowers staffing and data management costs, and improves security and compliance.

Cost Effective Desktop Storage.

The traditional enterprise desktop environment has proven to be challenging. According to Forrester Research, requirements of management, security, compliance, access, and business continuity are difficult to implement and expensive to deploy. Virtual Desktops promise to simplify desktop management, lower operational costs, reduce data loss, and improve security and compliance of your enterprise desktop environment.

Deploying desktop virtualization on N series storage fulfills the promise of virtualization with storage that makes virtual desktops affordable, scalable, and highly available. The end-to-end virtualization solutions from IBM deliver fully integrated virtualization solutions to help you focus less on your infrastructure and more on running your business through better storage utilization, scalability, flexibility, and centralized management.

To quickly adapt to unexpected storage demands with real-time scalability and flexibility IBM N series focuses on the following essentials for any virtual desktop solution:
- **Storage Efficiency:** Spend 50% less on storage
- **Operational Agility:** Provision 1000's of desktops and storage rapidly
- **Performance:** Maintain continuous access to desktops and applications
- **Compliance:** Ensure compliance of desktop data

Key Features

Reduce Storage Costs: VMware, Citrix, and Microsoft desktop virtualization solutions can benefit dramatically from IBM N series platforms. With the N series unified storage architecture and core storage virtualization features such as thin provisioning of virtual machine volumes, policy-based storage management, and primary storage deduplication of highly redundant OS data, reduce capacity needs and drive up storage utilization. Virtual Machine and file-level recoveries are enabled without the costs and headaches of traditional client server backup. The IBM N series' industry leading data replication products integrate with virtual infrastructures to simplify and automate site failure and data recovery.

The deduplication, for instance, provides space savings as much as 90% and the storage required for user data by 20%-50%. Only IBM N series can deduplicate primary data. Savings can be seen across all tiers; primary, backup and archival data.

Increase Infrastructure Agility:
IBM N series offers multiprotocol storage for virtual desktops and user data. Rapidly provision 1000's of virtual desktops in minutes. Instant thin clones of desktop Virtual Machines are offloaded to storage. This is done through "single pane of glass" management. You can also scale desktops in real-time. N series supports 1000's of desktops per system. System upgrades do not require data migration!

Provide Continuous User Access to Virtual Desktops: Eliminate downtime with a field-measured 99.999% uptime and the proven reliability of IBM N series storage systems. Now you can provide your users continuous access to their virtual desktops. Because N series storage efficiencies extend to the backup and DR environments, you can afford advanced replication and recovery capabilities for your virtual desktops. End users can recover their own data directly from desktops. You can maintain continuous availability of user desktops with transparent failover for component and system malfunctions. In the event of an unplanned site outage, you can recover to the DR site in minutes.

**Ensure Compliance of Desktop Data:** IBM N series provides centralized desktop and application backups resulting in consistency, archival for compliance, and immutable storage. Through SnapVault, SnapMirror, and Snapshot technologies, N series provides a full suite of data backup and disaster recovery solutions. Hourly and space-efficient backups are made possible with no load on servers and the daily user history is retained for months or years cost-efficiently. You can also secure user history in compliant read-only storage. Because of the transparent recovery from component failure and automatic failover for system and site failure, you can expect to achieve greater internal SLA goals.

IBM N series Value

Cost-effective Desktop Storage: Deduplicate virtual desktops up to 95%, dedupe end-user storage by 20%-40%, thin provisioning increases utilization to over 70%, and RAID10 protection at half the cost

Flexible Storage for Virtual Desktops: Multiprotocol storage for virtual desktops, provision 1000's of Virtual Machines in minutes using instantaneous clones and scale capacity in real time

Desktop Business Continuity: System availability, transparent recovery from component failure, and automatic failover for system and site failures

Unified Storage for Virtual Desktops

SAN

NAS

User Storage

User Data

Supports 1000's of desktops per system
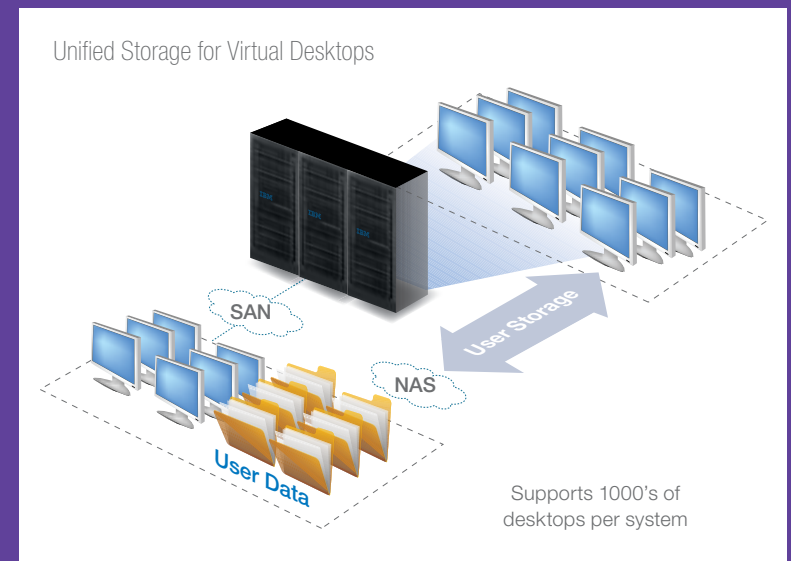
Customer Use Case Scenario

Diversified Chemical Company

Business Challenges
- **Sever consolidation:** Exchange and file services
- **Disk-backup:** No tape at remote site
- **VMware:** Shared-hosting environments for business critical applications

Solution Benefits

Do more with less:
- 5:1 reduced server counts, 80% reduction
- 92% lower energy consumption

Reduce complexity:
- Simplified storage backup management
- Automated backup processes
- User-recoverable data from Snapshots

Reduce risk:
- Higher service availability
- Data/files/mailbox recovery in minutes, not hours
- No storage-related incident calls

File Server Consolidation

IBM N series can help simplify your file server environment, improve user productivity, and lower costs. Achieve significant reductions in storage costs and administrative overhead by consolidating your existing Windows file servers.

Control Costs and Simplify Management.

With the dramatic growth of Windows data, many companies now have to manage infrastructures that span hundreds or even thousands of file servers. These complex, distributed environments unfortunately bring with them extremely high overhead costs, poorly utilized server and storage assets, difficult and time-consuming backup and restore processes, and reduced system availability. IBM N series storage solutions help organizations address the growing complexity of storing and managing files by enabling them to consolidate their storage on a single, scalable platform.

N series solutions deliver scalability, availability, and manageability while removing the traditional constraints of legacy storage environments. Consolidating Windows data onto a highly available N series platform results in valuable management, performance, and cost efficiencies. Enterprises can reduce storage expenses by up to 50% and overall TCO by more than 40% over competitive solutions while meeting current and future file storage needs.*

Key Features

Improved Storage Utilization and Time Savings: With FlexClone® you can quickly create file and file system clones using very minimal physical disk space. FlexVol® provides thin provisioning for fast storage provisioning and on-the-fly scalability, delivering the flexibility that is essential in a fast-changing, high-growth environment.

Administrative and Cost Savings: IBM N series solutions significantly reduce backup administration overhead. The multiprotocol SAN solution can be easily managed by existing Windows server administration staff. In addition, N series platform makes cost-effective usage of an existing network (IP) infrastructure. Other savings come in the form of improved storage asset utilization. Slash your costs by up to 40% and lower administration costs by as much as 60% through consolidation, higher utilization, and reduced downtime.*

High Availability to Ensure Business Continuation: IBM N series solutions enable reliable data recovery in minutes instead of hours. Enterprise-class reliability, near-instantaneous backups, and affordable disaster recovery help keep business operations online.
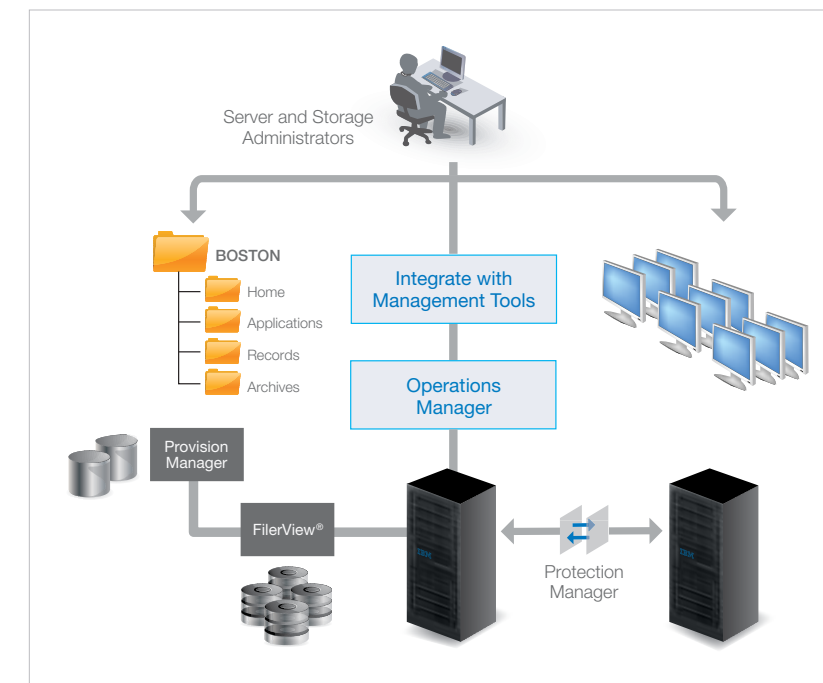
Flexibility and Investment Protection: IBM N series creates multiprotocol consideration opportunities. Simultaneous FCP, iSCSI, NFS, CIFS, and HTTP support ensures that storage can be deployed as needs change. Unify storage with simultaneous support for Windows and UNIX file serving and SAN!

IBM N series Value

Efficiency: Consolidation, flexibility, simplicity

Backup and Recovery: Reliability, automation, security, cost savings

Virtualization: Faster provisioning, better asset utilization, green savings

Server and Storage Administrators

BOSTON
- Home
- Applications
- Records
- Archives

Integrate with Management Tools

Operations Manager

Provision Manager

FilerView®

Protection Manager

*Source: Oliver Wyman study for NetApp, 2008. IBM branded systems are intended to obtain similar results.

Integrated Data Protection

IBM System Storage N series help to reduce costs associated with downtime and simplifies data protection, archive, and compliance across your applications and virtual infrastructure.

Integrated High Availability, Disaster Recovery, Backup and Compliance.

Enterprise administrators need to ensure data protection in increasingly complex environments. With so many different disk-to-disk data protection approaches to choose from, picking the right technology solution can be difficult. IBM N series data protection solutions overcome the cost and complexity barriers that have limited the widespread adoption of Disaster Recovery (DR) solutions, empowering you to better protect your applications from site and regional disasters. N series solutions are fast to deploy and easy to manage. With N series you can deliver exceptional data availability to all clients on the network with architectural simplicity, fast data recovery, storage efficiency, and affordable DR solutions that enable customers to protect more applications for less.

Key Features

Single Platform for Data Protection: Deploy and manage fewer products with data protection services embedded in Data ONTAP®. High availability disaster recovery, backup, and compliance services are all built into the storage platform and available on demand. This lets you quickly roll out new services or adjust the level of coverage you provide as recovery and compliance objectives change.

Lower Costs and a Smaller Footprint: Reduce costs and the total size of your data protection environment by using fewer storage, network, and server resources. Deduplication and Snapshot copies can minimize capacity needs by 90% or more.

Thin replication reduces network consumption by up to 70%. Embedded services drive additional efficiency because fewer external systems need to be purchased and maintained.

Fast and Reliable Protection: Increase the speed and reliability of protection with high-speed Snapshot copies. Snapshot copies are captured in less than a second and can be created several times a day for maximum protection against data loss. For long-term protection, you can replicate Snapshot copies and retain them offsite for years. In each case, they are constantly monitored to identify potential issues before a restore is needed.

Management Simplicity: Simplify the process of protecting and restoring business operations with a management framework that tightly integrates with mission-critical applications and virtual infrastructures. IBM N series data protection can reduce management overhead by 40% or more and deliver advanced recovery for Exchange, Oracle®, SQL Server®, and virtualization software to simplify the process of recovering mission-critical operations.
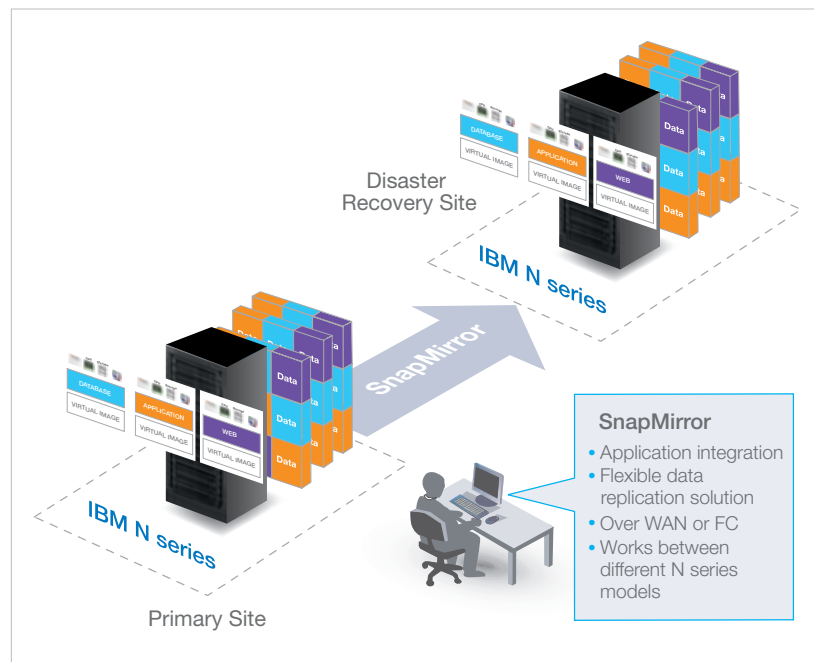
Superior Disk-to-Disk Backup: Complete backups in minutes and increase overall reliability with IBM N series disk-to-disk backup. The incremental backups minimize both network traffic and storage usage for lower costs and significantly faster recovery. And with the increased reliability of disk-to-disk data protection, you can achieve 100% success rates while reducing or even eliminating the need for tape.

IBM N series Value

Simplicity: Provides simple setup and recovery, plus the benefit of leveraging a single replication solution across all storage systems

Flexibility: Choose between MetroCluster and SnapMirror for DR

Cost Effective: Customers can afford to protect more of their data using N series disk-based solution, mirror to inexpensive SATA target for increased storage efficiency, network efficiency, and flexibility

Disaster Recovery Site

IBM N series

SnapMirror

IBM N series

Primary Site

SnapMirror
- Application integration
- Flexible data replication solution
- Over WAN or FC
- Works between different N series models

IBM Global Technology Services

IBM's broad portfolio of technology services, with IBM's N series and NetApp's industry-leading storage products, provides comprehensive, innovative infrastructure solutions addressing storage efficiency, server virtualization, desktop virtualization, file server consolidation and data protection. IBM's Global Technology Services solutions provide insight into your storage environment as well as recommendations based on best practices. Through these solutions IBM can help you reduce IT complexity and business risks, control costs and realize the benefits of a more efficient storage, server and desktop environment.

With the combined IBM and NetApp technologies, you will benefit from proven expertise in addressing your specific storage challenges. For more information: **www.ibm.com/services**