Easy as NAS solution guide

3rd edition

Simply StorageWorks

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Overview

Digital information is a critical component of business at present. It grows in volume every day, and needs to be efficiently managed, securely stored and constantly available. Yet it's not just large enterprises that face these pressures. Many smaller businesses are now seeking better ways to look after their growing data, and are investigating the advantages of storage-specific solutions.

HP's Network Attached Storage (NAS) provides a flexible, intelligent, simple to-manage solution for file-and-print and application-storage consolidation. It's the perfect technology for customers that want to deploy dedicated storage servers in their existing infrastructure, as it leverages familiar server and operating system concepts.

How can this guide help?

Implementing a new server and storage concept to your IT components may seem like a daunting prospect but, with this guide, HP makes it easy. We'll provide a basic introduction to what NAS technology is all about, explore its more advanced capabilities, and help you choose the right solution, based on HP ProLiant storage servers, for your specific business needs.

Part 1: Introducing Network Attached Storage
(pages 3–8)
Here we look at what a NAS solution consists of, how it integrates with other technologies and the security capabilities that HP offers.

Part 2: Identifying your needs
(pages 9–13)
In this section, we consider four specific NAS solutions, based on different end-user environments, that will help you identify your own particular storage server needs.

Part 3: Choosing your products and services
(pages 14–18)
This section of the guide will help you choose the right storage server solution for your needs.

Part 4: Complete your knowledge
(pages 19–23)
Complete your understanding of NAS technology with quick answers to commonly asked questions and simple definitions of the key technology terms. Plus, see how HP Services can complement your solution with compelling service offerings.

Part 1: Introducing Network Attached Storage

The challenges of DAS

Before we start looking at the advantages of Network Attached Storage (NAS), we need to consider what your existing environment looks like, and the challenges that your IT staff is likely facing every day.

The most common method of storing data – whether it be on desktops, workstations or servers – is using embedded hard drives or Direct Attached Storage (DAS). As your data volumes grow and you need more capacity, you simply add more hard drives, upgrade to higher capacity disks or purchase additional systems. However, this approach results in a number of challenges for your storage administrator:

Decentralised data

As the number of DAS systems grows, data becomes increasingly dispersed throughout the company, making it difficult for users to know what resources exist and where to find them.

Under-utilisation of storage resources

As more servers are added to your environment, you need to ensure efficient utilisation of their storage. Because DAS is local to each server, you may have space available on one server, but capacity exceeded on another. Anticipating data growth and managing storage utilisation is a key challenge.

Proliferation of storage devices

Adding servers and DAS devices may be an effective solution to coping with data growth. However, you must ensure that your IT staff have the capacity to manage and maintain them all, and that your budget can extend to add data protection to each server to perform data backup.

Backing up open files

Backing up a file that is in use on the network can result in data being corrupted. To avoid this, your backup process must be performed during evenings or weekends when users are not on the network. However, as data volumes grow, the time it takes to back up all your files can exceed your backup windows and run into normal business hours – risking data corruption.

What are HP ProLiant storage servers?

HP ProLiant storage servers leverage standard Ethernet-based networks to provide consolidated Network Attached Storage (NAS) for file-and-print serving, as well as iSCSI-based application data hosting.

As a preloaded and preconfigured solution, HP ProLiant storage servers can be deployed straight out of the box for "plug-and-play" connectivity, and are fully tested to ensure functionality, performance and compatibility.

For dedicated file serving – with the option of also using them for network printing – they combine simplified web interface management with an optimised Microsoft® operating system designed specifically for storage. This makes HP ProLiant storage servers the preferred solution over standard Microsoft Windows Server™ solutions (such as standard HP ProLiant servers) as they are storage centric, rather than application centric. They are also ideal companions for your standard application servers when consolidating your application data storage.

When are storage servers an option for new server deployments?

If you need to deploy new servers in your environment – and have any of the following requirements – then choosing a storage server will be of immediate benefit to your organisation.

1. You need to deploy a shared storage solution quickly and easily
2. You want to consolidate the number of file and print servers you are using in order to optimise capacity utilisation and performance usage
3. You have to reduce the time and personnel required to manage and protect your data
4. You are looking at disk-based data-protection solutions as an interim step or alternative to tape backups
5. You run clients with a variety of operating systems (Microsoft Windows®, MAC OS, Linux®) and want a storage solution that can integrate with them all

The building blocks of a NAS solution

HP ProLiant storage servers combine integrated standard features with optional solution components to make up an overall NAS solution that easily adapts to your specific needs.

Standard components of NAS

The following four features power all HP NAS solutions:

The operating system

All HP ProLiant storage servers come pre-installed with Microsoft Windows Storage Server 2003, a special edition of the Microsoft Windows Server operating system, which is optimised for maximum storage performance and light-touch management.

Management

Following successful deployment comes efficient management. HP ProLiant storage servers are easily managed from any standard web browser, and offer additional remote options with terminal services and Integrated Lights-Out. Furthermore, they include tools for setting directory quotas* and reporting, as well as content filtering, which restricts users from storing undesired file types on a share.

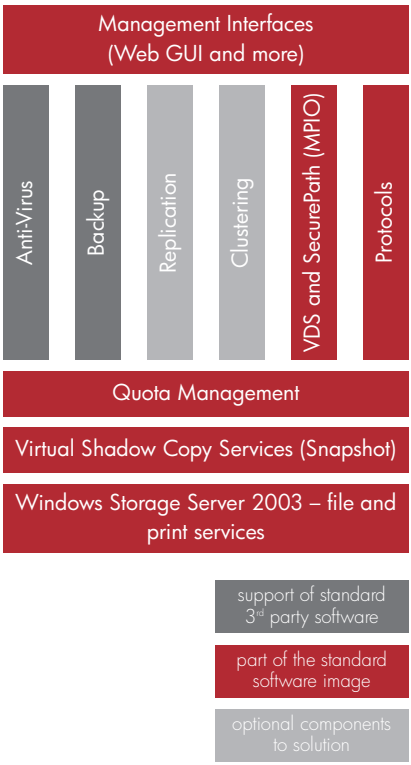
Universal connectivity

Pre-installed file protocols enable access from Windows, NetWare, Linux, UNIX® and Apple clients – plus native support for HTTP and FTP. No hidden software licences are required for protocol support, and no Microsoft Client Access licences (CALs) are needed.

Shadow copy snapshotting

With the shadow copy function, administrators can create scheduled data snapshots of shared folders. This allows clients to restore accidentally deleted or overwritten files by themselves, simply by looking up the 'previous versions' tab in their Windows Explorer properties. Restoring from tape is no longer needed.

NAS software architecture



*Note: the built-in quota management feature is only usable for non-clustered configurations.

Maximising security of your NAS solution

In addition to the optional anti-virus capabilities of HP ProLiant storage servers outlined on page 5, the following technologies and features will help ensure the highest level of security for your business and the data:

Network security and authentication

HP NAS solutions make it easy to authenticate your network users, services and devices, thanks to the centralised, secure network management of Active Directory Services (ADS) – an integrated feature of Microsoft Windows Storage Server 2003.

Auditing

Almost any task that's performed on your NAS server – logon, logoff, security modification, password changes, user creation, etc. – can be audited and logged, allowing administrators to track any suspicious activities.

Operating system patches

To ensure that your systems have the optimum level of protection at all times, critical security patches can be installed as soon as they are released by Microsoft – without separate qualification by HP. HP also recommends using the Automatic Update features within the operating system.

Access management

HP NAS solutions enable you to grant authenticated users and groups access to file and share levels with ease via the Access Control Lists feature of Microsoft Windows Storage Server 2003. This also includes a locking mechanism that allows safe concurrent access from all supported file-sharing protocols.

Integration in your existing UNIX environment

HP ProLiant storage servers do not only represent a file-serving solution for Microsoft Windows environments, they also allow for consolidation of heterogeneous environments featuring both Windows and UNIX.

With built-in support for NFSv2 and NFSv3 UNIX file-server protocols, HP ProLiant storage servers enable your NFS clients to access UNIX file systems in exactly the same way as a normal UNIX server – enabling you to migrate from your existing NFS file server to a new HP NAS solution with ease.

Storage servers also leverage their own underlying storage management features to provide NFS file-server services. This allows you to:

- Issue quotas on volume and directory levels
- Restore previous versions of volumes, folders or individual files easily via snapshots
- Ensure that failover of NFS shares within a clustered NAS environment will be transparent to the connected clients, just like for CIFS shares
- Handle all NFS-related management tasks easily through the NAS web-based user interface – reducing the need for administrators to have extensive NFS skills
- Share files concurrently through NFS and other protocol environments. System security and locking mechanisms ensure access to files without the risk of data corruption

Manage your UNIX user accounts simply

Users accessing an HP ProLiant storage server can be defined locally on the NAS server itself, or by using ADS (Active Directory Services) or NT domains. To integrate with NFS environments, any of these accounts can simply be mapped to UNIX user accounts, either with a NIS environment or with simple password files.

For customers looking to fully integrate and manage all UNIX and Windows users from a single Active Directory, Microsoft offers an Active Directory-integrated NIS server as part of Microsoft Services for UNIX.

Consolidating file and application storage with HP NAS and iSCSI Feature Pack

Consolidation of file data has always been the domain of NAS, while consolidation of block level application data has usually required investment into a separate fibre-channel SAN. However, with the HP ProLiant Storage Server iSCSI Feature Pack, you can now host application data on your storage server without investing in a SAN infrastructure.

This new, low-cost storage technology uses industry-standard hardware and software on existing Ethernet infrastructures – making it ideal for smaller environments that require simpler manageability, easy scalability and centralised backup, but need less performance or availability.

It may also be used in larger environments, for example, on a storage server deployed as a NAS/SAN gateway. Here it would act as a bridge between the iSCSI/Ethernet network and the standard fibre-channel SAN.

Simplified management for Microsoft Exchange data hosting

The iSCSI Feature Pack has been tested and qualified as a storage system for Microsoft Exchange 2000/2003 data. It allows the hosting of the databases and logs up to two Exchange servers on a single storage server.

Plus, for simplified management, the embedded HP ProLiant Application Storage Manager tool reduces process steps, setup training needs and knowledge requirements to monitor e-mail stores. It also ensures best-practice implementation through automation.

Hosting Microsoft SQL/Oracle data

You can also host Microsoft SQL 2000, SQL 2003 and Oracle®9i/10g database stores on a storage server running the iSCSI Feature Pack. For easy setup and management, use the storage server's standard management interface.

Benefits of iSCSI Feature Pack

The iSCSI Feature Pack helps you to consolidate multiple servers running their own direct attached storage (DAS) to a single, scalable storage server platform that enables centralised backup.

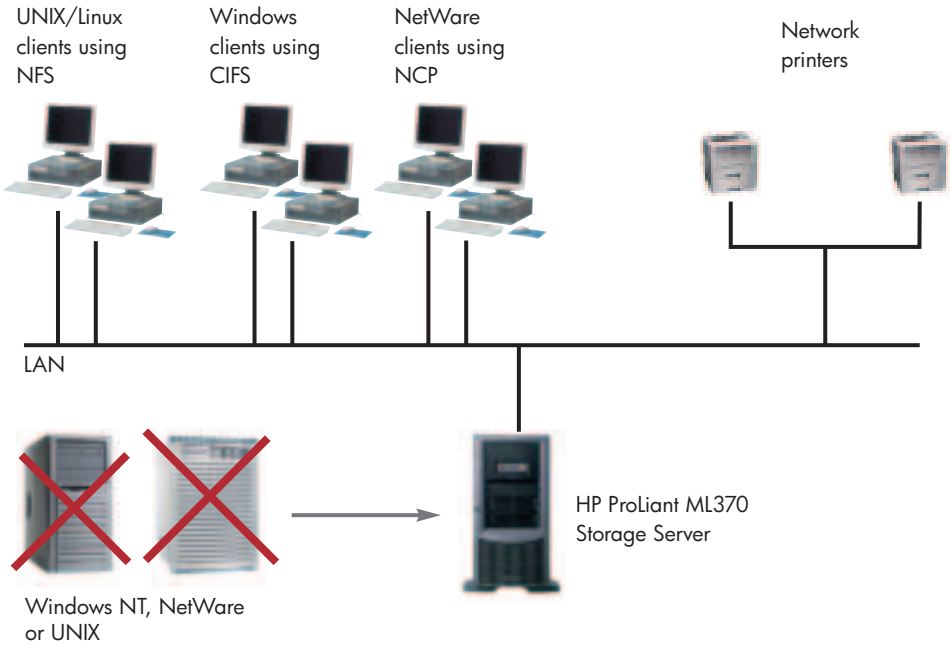
Furthermore, it works on standard Ethernet technology – so you don't have to invest in any new infrastructure – and it offers an easy and familiar management interface that's integrated with the web-based interface of Microsoft Windows Storage Server 2003.

Part 2: Identifying your needs

Typical NAS solutions

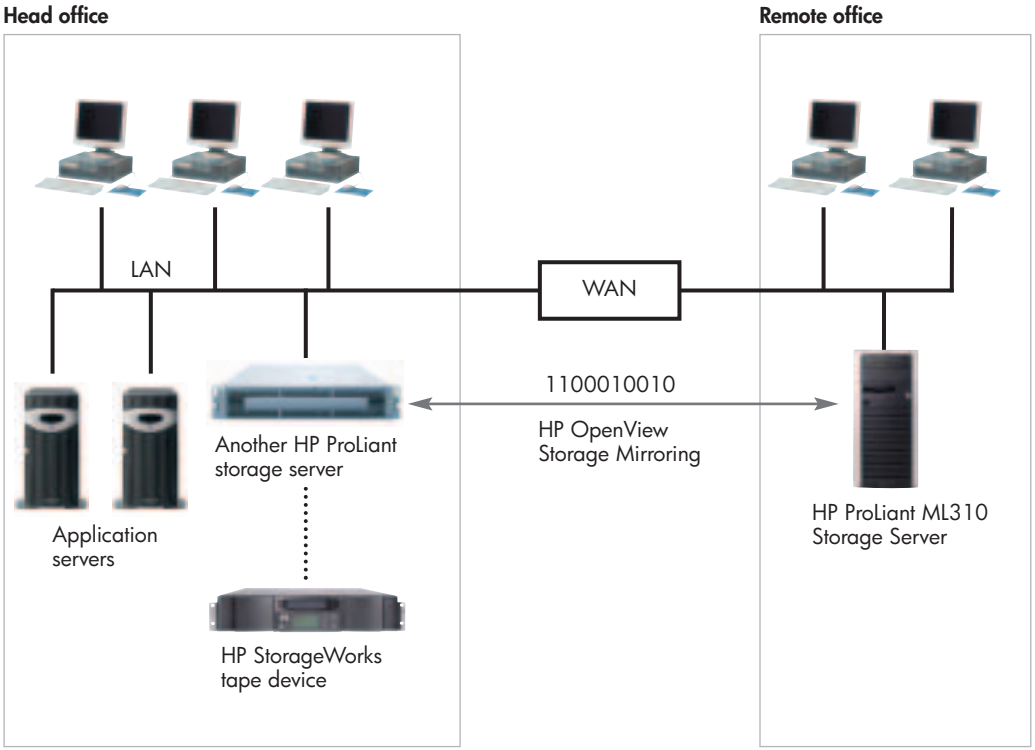
The following are examples of how you can use NAS solutions based around HP ProLiant storage servers to solve a range of business challenges or issues:

File and print server migration and consolidation



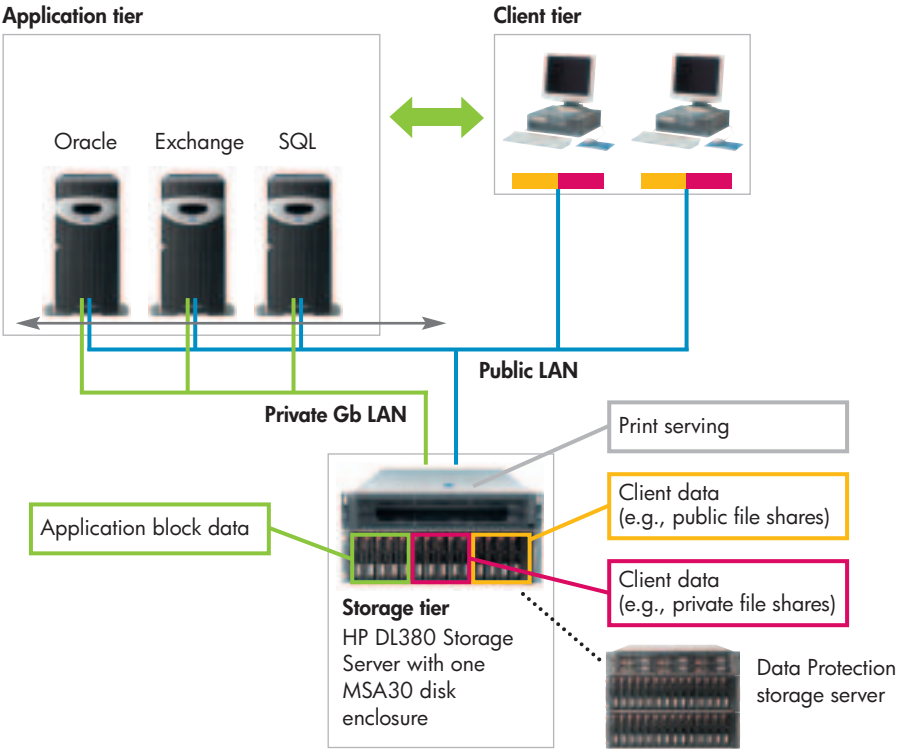
- Upgrade from your current file server platform (e.g., Windows NT 4.0) to a next-generation storage server with HP NAS.
- Migrate other file server platforms (e.g., UNIX and NetWare) and consolidate them on a single storage server.
- HP NAS technology is perfect for serving clients in heterogeneous environments (Windows, UNIX, NetWare, Apple, web staging, etc.) from one single platform.
- Migration of clients from one platform to another is simple (see previous page).
- Storage servers can also be used as print servers, giving you a true file and print solution.
- Consolidating on storage servers gives you maximum storage performance, combined with light-touch management.

Remote replication and backup consolidation – e.g., in branch offices



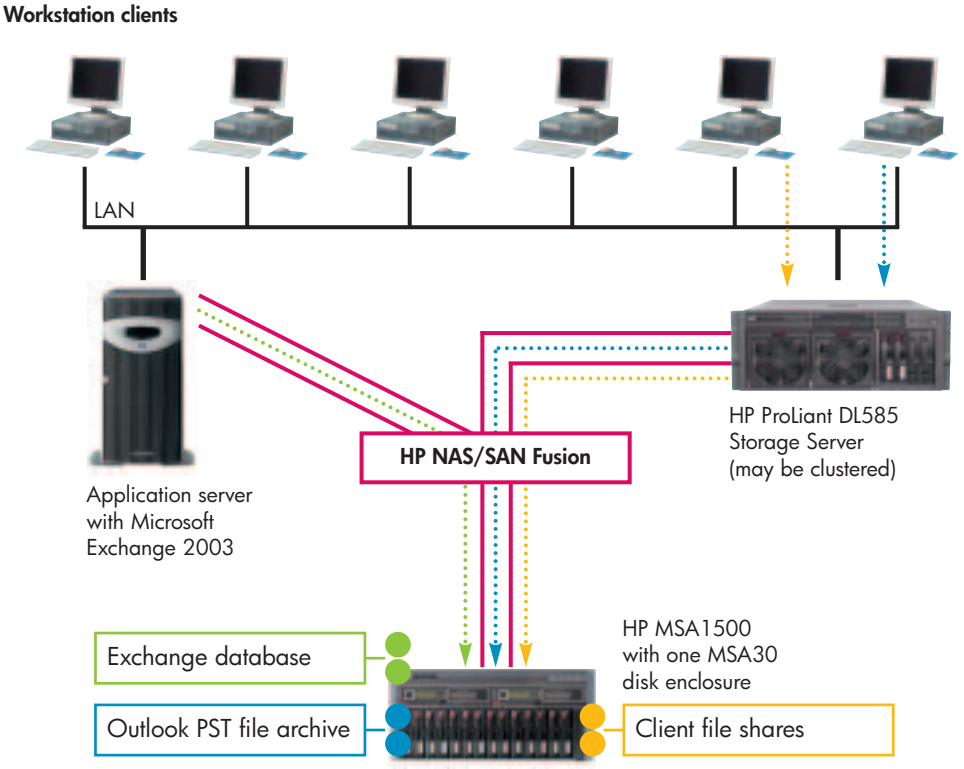
- Thanks to simple remote manageability, HP ProLiant storage servers can easily be used to deploy file serving at remote sites.
- You can replicate data between a central office and branch office locations with HP OpenView Storage Mirroring software, and thereby benefit from both centralised server administration and tape backup.
- File servers at your distributed locations no longer require onsite management and will receive maximum service from your central site.

Unified application data storage and file serving with iSCSI Feature Pack



- Use HP ProLiant storage servers with the iSCSI Feature Pack for true storage consolidation in small to medium environments.
- Store the data of your application server on a storage server (which can also be deployed as a file and print server).
- No need to invest in a fibre-channel infrastructure; this storage solution is based on very affordable standard Ethernet infrastructure technologies.
- Application data and storage data is separated into different tiers to provide optimised performance for each.
- In this scenario, three application servers (that could be clustered) are connected via a private Ethernet network to the storage server, which is also serving files to end-user clients.

Integrate storage servers into a SAN with NAS/SAN fusion



- Just as application servers can store their data in a SAN, a storage server can be set up as a gateway for clients to leverage the advantages of a SAN: pooled storage capacity, central management, high availability and integrated backup and recovery procedures.
- This unique fusion eliminates storage islands and reduces overall management complexity and costs.
- The example here shows a Microsoft Exchange server (red line) sharing the same storage source as its clients which are using it as a client data share (blue line) or personal drive (yellow line).

Specific configuration examples

These configurations demonstrate the types of systems and flexibility available from HP. Below is a sample bill of materials – including hardware and software – recommended for customers ordering their first NAS solution. The standard warranty for each configuration can be enhanced with the optional HP Care Pack Services listed at: **www.hp.com/hps/carepack**

File and print: 50 users who require 2 GB per user, print support and single tape backup

Description	Part number	QTY
HP ProLiant DL100 G2 Storage Server – model 640-GB	397587-B21	1
HP StorageWorks Ultrium 215i Tape Drive	Q1543A	1

File and print and Exchange data hosting:
300 users who each require a 3 GB file share and a 300-MB mailbox

Description	Part number	QTY
HP ProLiant DL380 Storage Server – External SCSI model (incl. 4 x 300-GB disks)	371225-B21	1
300-GB 10k rpm SCSI universal disk drive	371224-B21	4
NC6170 1-GB dual port network interface card	313879-B21	1
HP ProLiant Storage Server iSCSI Feature Pack incl. HP ProLiant Application Storage Manager	T3669A	1

500 users who require 10 GB per user
No single point of failure solution

Description	Part number	QTY
HP ProLiant DL380 Storage Server – SAN Model	371227-B21	2
NAS cluster kit	331474-B21	2
MSA1000 starter kit	313879-B21	1
MSA1000 HA kit	353804-B21	1
MSA30 dual bus disk enclosure	302970-B21	1
300-GB 10k rpm SCSI universal disk drive	371224-B21	15

Optional NAS software

Description	Part number
HP OpenView Storage Mirroring MS media kit	T2558AA
HP OpenView Storage Mirroring Workgroup NAS Edition LTU 1	T3841AA

Note: All configurations here use RAID 5 volumes for user data. 72-GB and 146-GB drive variants are also available. Solutions from HP typically require rack-mounting hardware not outlined in this guide. All Storage Mirroring licences require a media kit; one licence per server node required. LTU = licence to use.

Part 3: Exploring advanced NAS capabilities

We will now consider the more advanced capabilities of NAS, and how these can help larger organisations solve their growing storage challenges.

Creating an integrated storage environment with NAS/SAN fusion

Businesses that require mission-critical levels of performance, scalability and availability will naturally choose a Storage Area Network (SAN) as their primary storage concept. However, by integrating NAS to the SAN environment as well, you'll benefit from the advantages of both storage concepts:

- **NAS solutions** combine optimised storage performance with light-touch management – providing network file storage that can be accessed directly by all users over the corporate network.
- **SAN solutions** provide highest availability of larger storage capacities, combined with integrated management and optimised efficiency. SAN storage is traditionally accessed by application servers.

With HP NAS/SAN fusion technology, you can enhance your existing investment in SAN technology by combining it with the added benefits of NAS. Alternatively, an entry-level solution is provided by the iSCSI Feature Pack (see page 8), which enables you to achieve SAN capabilities on a standard Ethernet infrastructure.

Comparing NAS with SAN

	NAS	iSCSI NAS	SAN
Type of data	Shared files	Block data (databases)	
Cabling used	Ethernet LAN		Fibre channel
Consumer	PCs and workstations	Application servers	
Disk access	Through NAS appliance	Direct access	
Management	Simplified		

Achieving even higher availability

HP NAS solutions are designed to enhance the availability of your data. However, when you combine NAS with SAN, there are even more options to ensure your data is always up and available.

Clustering

To enhance the performance and redundancy of a single system, both the HP ProLiant DL380 Storage Server (SAN model) and DL585 Storage Server can be joined in a cluster of up to eight systems. This shared storage arrangement is achieved via HP NAS/SAN fusion technology. Working in parallel, the clustered systems give you additional performance. They also monitor each other so that, if one fails, its workload is instantly picked up by another cluster node.

SAN-based data replication

Data replication keeps an up-to-date copy of your critical data in a separate location, online and ready to be used at any time – enabling fast disk-based disaster recovery. As we have seen earlier in the guide, solutions based around HP OpenView Storage Mirroring allow you to achieve cost-effective data replication.

However, the highest availability and performance requirements are usually met by replicating data between two arrays, such as HP StorageWorks EVA or XP arrays, using HP StorageWorks Continuous Access software. You can achieve SAN-based data replication on your HP ProLiant storage servers by integrating them into a NAS/SAN fusion solution.

System recovery

Effective recovery from disaster requires a quick and simple system-recovery procedure. All HP NAS servers are shipped with an instant-recovery CD, which quickly recovers your system back to factory status. And with ASR (Automated Server Recovery) you can go even further. By backing up your server system disk – including configuration data such as server name, IP address and user mapping – it enables you to restore a full previous configuration following system disaster.

Integrated NAS monitoring

Integrated server monitoring

HP NAS solutions provide excellent integration to your existing system-monitoring tools. This is especially true if you run HP Systems Insight Manager, because all the required agents are pre-installed and become activated instantly after setup. Your NAS server can then be monitored by the Systems Insight Manager console just like any other ProLiant server.

HP Systems Insight Manager provides easy-to-use, centralised monitoring of your entire server environment – including all system components such as the network interface, memory, processors and disks. When integrated with HP OpenView it allows comprehensive, service-level-based management of your enterprise.
For more information, please visit:
www.hp.com/eur/hpsim

Integrated server management

In addition to server configuration, integrating NAS into Systems Insight Manager allows you to analyse your system and initiate management tasks remotely with tools such as a web-based user interface, Terminal Services, Command Line, Microsoft Management Console (MMC) and Integrated Lights-Out management (iLO). HP iLO technology allows you to cold boot or troubleshoot your NAS server before the operating system is even running.

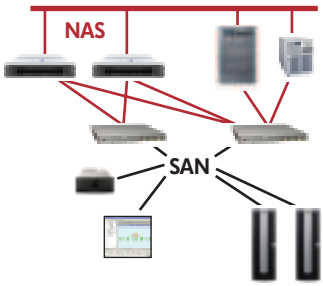
Integrated SAN monitoring and management

NAS/SAN fusion environments – based on MSA1000 or MSA1500 arrays – leverage HP Smart Array technology and offer full monitoring and management integration into HP Systems Insight Manager. This enables both your NAS server and SAN storage to be managed in one single tool.

Larger SAN environments, especially those with EVA and XP storage arrays, utilise specialised storage management tools for enhanced monitoring capabilities. For example, HP OpenView Storage Area Manager (SAM) can monitor the entire storage infrastructure, from logical volumes, HBAs and the fabric infrastructure, to the storage hardware within the array.

The HP product portfolio

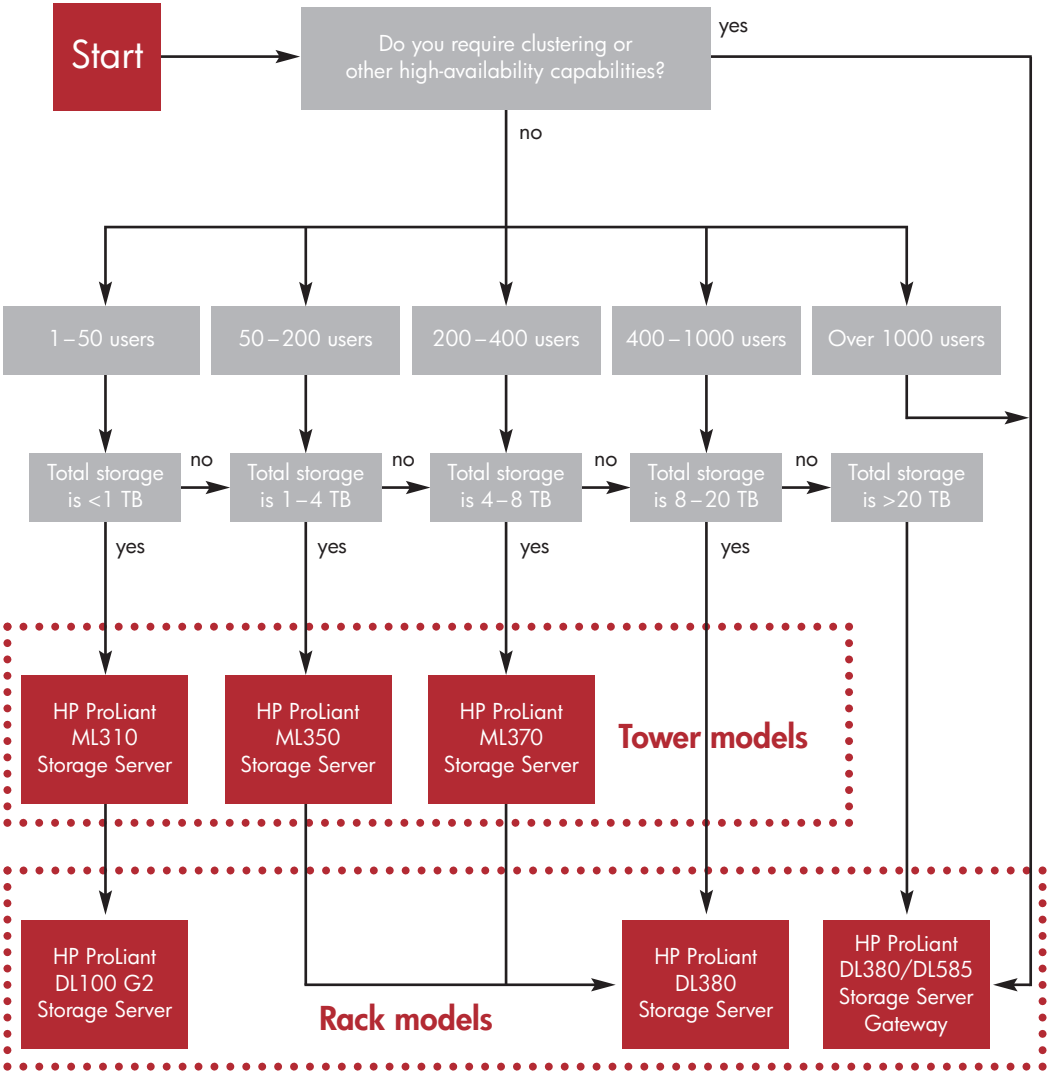
With a full portfolio of HP ProLiant storage servers, you can choose the level of performance and scalability you need to meet your specific business requirements:

	Remote Office	Departmental	Enterprise
	Standalone NAS		Gateways for NAS/SAN fusion
Rack Line	 **DL100 G2 Storage Server**	 **DL380 Storage Server (Standalone)**	 **DL380 Storage Server (Gateway)**	 **DL585 Storage Server (Gateway)**
Tower Line	 **ML310 Storage Server**	 **ML350 Storage Server**  **ML370 Storage Server**	
	Fixed configuration, SATA storage	Scalable, SCSI/SATA storage	Entry-level NAS/SAN fusion	Flagship NAS/SAN fusion

Appliance → Scalability, HA

HP ProLiant ML310/DL100 G2 Storage Servers	HP ProLiant ML350/ML370/ DL380 Storage Servers	HP ProLiant DL380 (Gateway) Storage Server	HP ProLiant DL585 (Gateway) Storage Server
1U rack/desktop or 5U tower model	2U rack or 5U tower model	2U rack model	4U rack model
1 Intel® Single or Dual Core	1-2 Intel Xeon™	2 Intel Xeon	2-4 AMD Opteron
2 PCI slots (plus 3 PCI-X slots for ML310) for redundant NIC	3 PCI slots (4 PCI plus 2 PCI-X for ML models) for redundant NIC	3 PCI-X slots for redundant NIC card or FC HBAs	5 PCI slots for redundant NIC cards and FC HBAs
1 single or dual-port NIC	1 single or dual-port NIC	2 dual-port NICs	2 dual-port NICs
File and print services included	iLO-based management (optional on ML350), HP Systems Insight Manager support	iLO-based management, clusterable up to 8 nodes, unlimited SAN scalability, supported across the entire line of HP disk arrays, HP Systems Insight Manager support	

Which HP NAS solution is right for you?



This page considers only file serving. For configurations that include additional software (i.e., iSCSI Feature Pack, anti-virus, backup and recovery software), please refer to www.hp.com/eur/easyasnas. Technically, you may configure a solution that exceeds the configuration limits shown here. However, the purpose of this decision tree is to show you the best rational distinction between each storage server model. The disk capacities listed here are raw data capacities that do not take into account any RAID overheads.

Part 4: Complete your knowledge

Further considerations for configuring your storage server

1. What total system throughput do you require? Also, how many concurrent connections (users) are required?

The average data throughput for file servers in production environments today is between 8 and 12 MB/sec. Please refer to the Easy as NAS website for the specific system throughputs of each HP ProLiant storage server. To achieve higher overall data throughput, you can scale across multiple servers via DFS, or by distributing shares across up to 8-node clusters.

2. Do you require optimal network performance from your NAS system?

TOE (TCP/IP offload engine) cards enhance performance by offloading network processing from the system CPU to the TOE card CPU. It's like having a dedicated processor to handle network traffic that frees up system processors for other tasks. TOE cards can in some cases boost performance by up to 30% depending on current load.

3. Do you have requirements for high availability of your NAS configurations?

Both the HP ProLiant DL380 (SAN model) and DL585 Storage Servers provide high availability capabilities through clustering. They also provide substantial flexibility via their available PCI slot connections – three on the DL380 and five on the DL585. Optional redundant paths to both the network and the back-end storage sub-system can help increase availability, in addition to the use of clustering at the system level. Furthermore, data replication software – e.g., HP OpenView Storage Mirroring and HP StorageWorks Continuous Access – in combination with clustering can also improve availability.

4. Do you require anti-virus and/or quota management software on your NAS server?

If you require additional management layers in your NAS solution, additional processors may be needed in your configuration. The HP ProLiant ML300 series, DL380 and DL585 Storage Servers all provide multi-processor capabilities, with the DL585 providing up to four CPUs. Whichever NAS solution you choose, TOE cards can provide even more processing power to achieve optimal performance.

HP Services

HP offers a full range of pre-packaged or customised services to complement our NAS solutions. These cover the entire project lifecycle and are delivered by qualified and certified HP professionals or designated channel partners.

Availability

Our proactive and reactive availability service components deliver the right balance of guaranteed availability and cost-efficient maintenance. Choose from basic onsite hardware and software maintenance, up to highest-level availability with our Critical Services portfolio.

Design and integration

We'll help you create a NAS infrastructure that meets your current and future needs, and choose the most suitable architecture – NAS, SAN or both. HP deployment services can integrate your solution quickly and efficiently.

Data migration

HP can also provide stress-free migration of data from existing storage systems – such as mission-critical HP-UX, Windows 2000, Windows NT, Sun legacy and EMC systems – to your new NAS solution.

Performance services

HP performance services – including assessment, tuning, measuring and monitoring – help you optimise IT performance and efficiency, for maximum return on your investments.

Customised business solutions

HP offers a whole range of services to ensure your IT infrastructure remains scalable and responsive, and supports your business properly.

For full details, contact your HP sales representative or visit: **www.hp.com/hps/storage**

Your questions answered

Q: What is the advantage of an HP ProLiant storage server over a general-purpose file and print server?

A: An HP ProLiant storage server is the ideal device for storage-focused server deployment. As a ready-to-go solution, it simplifies implementation and offers best file-serving performance and highest efficiency for ongoing management, even in a remote setup or a multi-platform environment. In addition, with the iSCSI Feature Pack it offers a new cost-effective possibility to store application data on a consolidated storage server platform – removing the need to invest in a separate fibre-channel storage infrastructure.

Q: How can I back up the data on my NAS system?

A: The HP strategy for NAS backup is designed around 'customer choice'. Being treated like any other Windows Server 2003 system, ProLiant storage servers can integrate into your existing backup strategy. A complete and up-to-date list of supported backup and other third-party software can be found at: **www.hp.com/go/nas**

Q: How can I protect the data on my NAS server from viruses?

A: Again, the HP anti-virus strategy is 'customer choice' and storage servers should be treated like any other Windows Server 2003 device. For a complete list of supported anti-virus programs and other third-party software, please visit: **www.hp.com/go/nas**

Q: What is snapshotting technology?

A: Snapshotting technology allows data to be duplicated with minimal usage of disk space. The file index information of a particular volume is duplicated and presented as another volume to the NAS system. This duplicated volume then holds a point-in-time copy of the original volume. Any subsequent changes to the original volume will use up disk space. This is because the original file is copied to the snapshot volume before it is modified. For example, a 100-GB volume that has 10% changes per day would require a 10-GB snapshot volume.

Q: How can I increase the performance of my HP NAS system?

A: Ideally, you would identify the bottleneck in the system and address this area. HP ProLiant storage servers can accommodate additional memory and an additional processor, depending on the model. Also, adjusting RAID sets and adding higher-performance HP hard disk drives for heavily impacted volumes can significantly increase performance. Network performance can also impact NAS performance.

Q: Please explain the protocols supported in more detail.

A: Common Internet File System (CIFS) is the protocol used by Microsoft to share files between Windows-based systems. Network File System (NFS) is the protocol used by Linux and UNIX systems to communicate. NetWare Core Protocol (NCP) and AppleTalk are for NetWare clients and Apple Mac systems respectively. All these protocols allow machines to mount a disk partition on a remote machine as if it were on a local hard drive.

Jargon buster

CIFS, NFS, NCP, MAC, HTTP and FTP

Protocols that allow machines to send information to one another over a network. For more information, see the Q&A section of this guide.

Clustering

The ability to group multiple NAS systems and appear to the end user as one logical NAS file server. A server in a cluster is called a node, i.e., four storage servers = a four-node cluster.

Content filtering

Allows administrators to restrict the types of file that are shared across the server, e.g., mp3 files.

DAS (Direct Attached Storage)

Deployment of dedicated storage devices for each server. Disadvantages include inefficient storage use and allocation, and multi-vendor storage and management interfaces.

Data replication

The ability to replicate data to another system/site via either a LAN or SAN connect.

DFS (Distributed File System)

System administrators using this protocol can make it easy for users to access and manage files that are physically distributed across a network. Files appear to users as if they reside in one place on the network.

DtS (DAS-to-SAN technology)

An exclusive HP feature that provides quick and easy data migration from direct-attached server storage to network storage such as MSA arrays or ProLiant storage servers.

Fibre channel

The topology and transport protocol used to send block-level data information between server and storage.

Heterogeneous connect

Allows clients or servers with differing operating systems to connect to the NAS or SAN infrastructure at the same time.

iLO (Integrated Lights-Out) management

Selected HP ProLiant storage servers offer embedded Lights-out technology, which enables users to perform a full range of management tasks, without physically being in front of the server. Find out more at: **www.hp.com/servers/ilo**

iSCSI (Internet Small Computer System Interface)

An Internet Protocol (IP)-based storage networking standard that carries SCSI commands over an IP network. Facilitates data transfer over intranets, LANs, WANs and the Internet for flexible storage management.

NIS (Network Information System)

A network naming and administration system for smaller networks. Allows users at any host to access files or applications on any other host in the network with a single user identification and password.

Snapshot

The ability to duplicate data within a server, NAS device or RAID Array and promote it as a copy of data while utilising minimal disk space.

HP NAS solutions have already helped the following companies

Meijer Inc.: The Michigan-based retail-chain giant used to operate with more than 150 file servers spread out over its multiple company locations. Supporting and upgrading these distributed systems was extremely costly and ineffective, so it decided to consolidate on an HP NAS/SAN fusion solution, including two HP NAS devices for optimised file-and-print serving.

BAA: The largest single airport operator in the world needed a cost-effective alternative to the direct-attached storage deployments at its numerous airport locations. The chosen solution had to deliver system uptime of at least 99.5% and provide essential disaster-recovery requirements. HP successfully met the objectives by implementing a stretched cluster of two NAS devices across two BAA data centres.

We can help you too. Visit: **www.hp.com/eur/easyasnas**

Simply StorageWorks

Storage is easy when you choose HP.

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