Easy as NAS solution guide

Overview
Digital information is a critical component of business at present. The volume of information that needs to be captured and managed grows every day – and that data often needs to be accessed around-the-clock. This growth is fuelled by the diverse variety of information your IT systems are now expected to accommodate. Multimedia files are now just as commonplace as the word-processing or spreadsheet files that dominated storage requirements just a few years ago.

Today’s IT managers are being faced with critical choices – do you restrict the type and quantity of information each user is allowed to use/access, potentially limiting their capabilities to undertake daily activities? Or do you continue to purchase individual hard disk drives, which are connected exclusively to a single server (Direct Attach Storage or DAS), that drain man-hours with management and monitoring?

While each of these choices has its own merits and shortcomings, there is another approach – a Network Attached Storage (NAS) solution. NAS provides a more flexible, intelligent and easier-to-manage storage resource that can not only keep up with today’s business challenges, but can adapt as your own needs and requirements evolve. The benefits of this approach include:

• Reducing the amount of time it takes to manage and allocate disk space
• Enabling the sharing of storage resources between workstations running different operating systems from different vendors
• A fully optimised and tuned file and print solution that can be deployed in minutes rather than hours, with full integration into your existing IT infrastructure
• The freedom to manage your solution from any place at any time through a standard Internet browser
How can this guide help?

Adding a new storage system to your IT components can be a daunting prospect. The purpose of this guide is to give you a basic introduction to NAS.

• What is NAS and the benefits it provides
• A simplified breakdown of the key components that make up a NAS solution
• Typical HP StorageWorks NAS solutions, including migration scenarios from Microsoft® Windows® NT® Server 4.0 and Novell® Netware®
• The benefits of the HP StorageWorks NAS strategy
• Suggested HP configurations for a varying number of users
• Both business and technical answers to frequently asked questions
• Jargon buster glossary

What is NAS?

The simplest way of understanding a NAS solution is to think of it as a highly tuned and optimised storage appliance that can connect to nearly all types of client devices, straight out of the box.

These client devices simply access the additional shared disk space provided by the NAS appliance, through any existing Local Area Network (LAN) or Wide Area Network (WAN) connection.

Because of the pre-installed nature of NAS systems, they are often referred to as "plug-and-play" storage solutions. This is because no operating system has to be installed, and no additional drivers have to be added for any of the hardware components needed to access its storage capacity.

In fact, once the NAS systems appliance has been connected and configured for your LAN – it’s just a matter of assigning access rights for your users through the web-based administration interface.
What makes NAS different from a Storage Area Network (SAN)?

This is probably one of the most frequently asked questions when discussing modern storage technologies. Storage Area Networks (SANs) and NAS fundamentally provide the same thing – networked storage – but both the method used and who benefits are very different:

- NAS solutions can be deployed in minutes using the existing LAN infrastructure – providing optimised storage space that can be accessed directly by all users over the corporate network.
- SAN solutions provide potentially limitless, raw storage capacity directly to servers over a dedicated infrastructure that can be tailored to meet your specific requirements and budget.

As such, this makes the two technologies complementary to each other, as many IT environments have the need for both types of storage solution.

How can NAS help?

NAS solutions will be of immediate benefit to your organisation if you:

- Are looking to deploy a shared storage solution quickly and easily.
- Need to reduce the time and personnel required to manage and protect the information you already have.
- Need to consolidate your Direct Attached Storage from disparate locations which are under-utilising existing capacities or performance.
- Have workstations/servers from various hardware vendors and do not want to continue buying individual storage solutions from each vendor.
- Are looking at disk-based data-protection solutions as an interim step or alternative to tape backups.
- Are looking to consolidate the number of file and print servers you are using.
- Need future-proof scalability of disk resources.
- Want to increase the effectiveness of your existing IT investments.

<table>
<thead>
<tr>
<th>Type of data</th>
<th>NAS</th>
<th>SAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared files</td>
<td>Block level data e.g. databases</td>
<td></td>
</tr>
<tr>
<td>Existing Ethernet LAN</td>
<td>Dedicated fibre channel</td>
<td></td>
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<tr>
<td>End-user clients</td>
<td>Application servers</td>
<td></td>
</tr>
<tr>
<td>Through NAS appliance</td>
<td>Direct access</td>
<td></td>
</tr>
</tbody>
</table>
What does a NAS solution consist of?

The HP StorageWorks NAS solutions covered in this guide all have a common architecture (illustrated below) and can best be explained as a series of building blocks that make up the overall NAS solution.

Core NAS features

The following three features power all HP StorageWorks NAS solutions:

**The operating system**
A crucial element of any NAS system, the operating system can directly affect the speed and ease of deployment. All HP NAS solutions run on Microsoft Windows Storage Server 2003 and are optimised for maximum file-sharing performance, straight out the box.

**Management**
Following successful deployment comes efficient management. HP NAS solutions are easily managed from any standard web browser, and offer additional remote options with terminal services and Integrated Lights-Out.

**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 required.

Core NAS features

User interface and management
Universal protocol support
Replication
Clustering
Anti-virus
Backup
Snapshot technology
Windows Storage Server 2003

Management

Core NAS features

Value added NAS features

Standard HP NAS software features
Optional HP NAS software features
Optional third party software features
Value added NAS features: availability and data protection

HP StorageWorks NAS solutions offer a variety of ways to extend the level of protection and security for your data:

Server clustering
If your availability requirements are higher than only redundant components built into a NAS device – such as network interface cards (NICs), disk drives or even power supplies – you may want to configure your solution to have multiple NAS devices acting as a single unit (called clustering) to ensure availability in the event of one individual NAS device failure. Clustering is offered in the NAS 4000s and the NAS 9000s* in configurations of up to eight nodes.

Data replication
This technology creates a complete mirror image of the data from one NAS device to another, leaving the original data intact and fully operational. Once the initial replication has occurred, only changes to that data are then synchronised between the two NAS devices – ensuring maximum performance. HP OpenView Storage Mirroring is an ideal data replication solution for protecting data that has to be immediately available in the event of data loss or corruption on the primary system.

Backup and recovery
HP NAS solutions are supported by most of the leading tape-backup software vendors and can easily be incorporated into any existing LAN- or SAN-based data-protection environment – or even attached directly to a tape drive. Optimum integration is achieved with HP OpenView Data Protector and HP StorageWorks tapes and tape libraries.

Anti-virus
HP NAS solutions are also supported by the industry’s leading anti-virus software vendors – and can be incorporated easily into any anti-virus procedure or policy, without adding additional anti-virus tools to your IT environment.

Data snapshots
Data snapshotting – a standard feature of Windows Storage Server 2003 – enables administrators to take a copy of all data, at any moment in time (referred to as a ‘point-in-time’ copy). This copy can then be duplicated and stored on another NAS device, or on tape media via any supported tape backup application, without affecting the original data. In addition, snapshots allow a simple and quick restore from disk, especially for client users running on Windows 2000 or XP where accidentally deleted files can be restored from their individual PCs without involving the IT department.

* The NAS 9000s is not covered in this guide. Please visit www.hp.com/go/nas for more information.
Share the advantages of the HP line of products

**Why HP?**
From dedicated, remote office or workgroup solutions, to consolidated NAS/SAN fusion solutions for the corporate data centre, HP provides the answers.

All HP StorageWorks NAS solutions are built on open, industry standards and are fully tested to ensure functionality, performance and compatibility.

**HP ProLiant Technology**
HP StorageWorks NAS products, starting with the NAS 2000s, are based on standard HP ProLiant servers that provide industry-leading server technology for your NAS solutions such as Integrated Lights-Out management and HP Insight Manager control.

**HP Smart Array Technology**
HP StorageWorks NAS solutions integrate seamlessly with HP Modular Smart Array (MSA) technology – offering an instant upgrade path for your existing StorageWorks arrays or ProLiant servers. And by using universal hard disk drives from HP, you’ll achieve maximum investment protection and risk-free migration when upgrading your storage capacity.

When deploying MSA disk enclosures or arrays with HP StorageWorks NAS appliances you instantly benefit from the Smart Array-based technology called DAS to SAN (DtS), which enables you to:

- Physically remove all HP universal disk drives from their internal or direct attached storage configuration and install them into a MSA30- or MSA1000-based NAS solution, without losing any data or configuration information
- Provide user access to the data volumes now relocated on the HP NAS
- Deploy the original server for its new role

DtS technology is ideal for customers concerned about the complexity and cost of deploying their first NAS solution.

For more information on DtS technology and the migration process please visit: [www.hp.com/go/msa1000](http://www.hp.com/go/msa1000) or contact your preferred HP storage partner.

More than just component synergy – a unique, easy migration path.
More than just component synergy – NAS/SAN fusion

The HP StorageWorks NAS 4000s and 9000s enable you to combine the complementary benefits of NAS and SAN to deliver the ultimate network storage solution.

NAS/SAN fusion enables you to:

- Scale a HP StorageWorks NAS 4000s or 9000s up to virtually unlimited storage capacity using a SAN infrastructure to provide enterprise levels of performance and resilience
- Provide both optimised file-level access to storage for end-user workstations and optimised block-level access for application servers
- Manage your NAS and SAN resources as a single entity from a single console - for example with HP OpenView Storage Area Manager
- Build on the industry standards of your existing SAN setup to lower your cost of ownership

For more information, please visit: www.hp.com/go/nas or contact your preferred HP storage business partner.

File Serving

Application/Database servers

Benefits to you

- Design for high availability
- Consolidated data protection
- Central storage management
- Virtualization
Why upgrade from Windows NT 4.0 to Windows Storage Server 2003?

Windows Storage Server 2003 is the latest appliance operating system from Microsoft. This appliance version is designed specifically for file and print environments with enhanced focus on storage management.

Benefits to you

- Higher levels of performance have been achieved with the standard file-serving protocols, including over 100% faster file serving than NT 4.0 (see chart below) and a 50% performance increase in UNIX file sharing over previous versions of Services for UNIX
- Reliability has been greatly enhanced by expanding the clustering capabilities to 8 nodes, which also provides increased scalability in a virtual NAS environment
- Basic quota management is included as standard, and is now also available at the folder level to allow for restrictions on how much data a particular folder can hold
- In addition to quota management, content filtering allows you to deter unwanted media files by restricting what type of file extensions are stored on the NAS system
- File system recovery performance has been greatly enhanced, and file system checks have been reduced by as much as 400% compared to Windows NT 4.0

For customers looking for a dedicated file/print solution, Windows Storage Server 2003 offers dependability, seamless integration and best value in networked storage. If customers require the flexibility to run multiple workloads, Windows Storage Server 2003 is a multipurpose operating system that enables doing more with less.

"For customers looking for a dedicated file/print solution, Microsoft recommends Windows Storage Server 2003."
Zane Adam, Marketing Director, Microsoft Enterprise Storage Division

NetBench File Server Performance
HP DL760 with 900MHz 4 Processors (CPUs) and 4 GB RAM

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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Throughput (Mbps)</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>1CPU</td>
<td></td>
<td>200</td>
<td>256</td>
</tr>
<tr>
<td>2CPUs</td>
<td>64%</td>
<td>300</td>
<td>356</td>
</tr>
<tr>
<td>4CPUs</td>
<td>59%</td>
<td>400</td>
<td>459</td>
</tr>
</tbody>
</table>

"Windows Storage Server 2003"
Why migrate from NetWare or UNIX to Windows Storage Server 2003?

In many mature environments, multiple server operating systems are prevalent. Typically, some of these are performing the same task - file serving. Reducing the number of network operating systems you have to manage, and consolidating the storage on these systems, can significantly reduce IT costs by simplifying staff expertise and the number of different manufacturers you need to purchase storage disk space from.

By migrating to Windows Storage Server 2003, you can take advantage of far wider application support for backup software and anti-virus applications. You’ll also acquire more features to manage your growing storage demands. For example, you can enhance your data protection with snapshot and replication tools – which are not standard features in traditional server operating systems – giving you simple and quick data restoration from disk and even immediate restoration in the event of sudden data loss or corruption.

The HP StorageWorks NAS systems mentioned in this guide provide multi-protocol support to ease migration from UNIX and NetWare environments to the Windows Storage Server 2003 platform.

In addition, Services for NetWare (SFN) and Services for UNIX (SFU) – which are fully integrated in Windows Storage Server 2003 – provide tools that help migrate files and synchronise your Active Directory service with your existing NetWare Directory Services (NDS) or UNIX Network Information Service (NIS) environment. And you can even make your new Windows Storage Server 2003 platform “appear” as if it were a NetWare or UNIX file and print server.

Benefits to you

- Save cost and simplify management by consolidating data from multiple operating system file servers to a single file and print server running Windows Storage Server 2003
- Simplify your directory administration with integrated Active Directory – a central repository that holds the information of your entire infrastructure
- Provides tools to assist in migration or to support heterogeneous client devices in your IT infrastructure
- Free your disparate IT departments from managing user data with different operating systems
- Consolidate the storage hardware vendors you use for disk purchases and storage management software
The HP StorageWorks NAS product portfolio enables you to choose the level of performance and scalability you need to meet your specific business requirements:

<table>
<thead>
<tr>
<th>Product Line</th>
<th>Remote office</th>
<th>Departmental</th>
<th>Enterprise/departmental</th>
<th>Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NAS 1200s</strong></td>
<td>• 320-GB, 640-GB or 1-TB storage using 4x ATA drives</td>
<td>• Intel® Pentium® 4 2.4-2.8 GHz processor</td>
<td>• Intel® Xeon 3.06 GHz processors</td>
<td>• High-end NAS/SAN fusion</td>
</tr>
<tr>
<td></td>
<td>• 512-MB DRAM</td>
<td>• Scalable to 27 TB with multiple MSA30 disk enclosures attached</td>
<td>• 3 PCI slots for redundant network or FC cards</td>
<td>• Up to 4 Intel Xeon 2.8 GHz processors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 (2) Intel Xeon 3.06 GHz processors</td>
<td>• 2-6 GB RAM</td>
<td>• 5 PCI slots for redundant network cards or FC HBAs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DfS migration support</td>
<td>• Ideal in combination with MSA1000</td>
<td>• 4-6 GB RAM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2-6 GB RAM</td>
<td></td>
<td>• Ideal in combination with EVA disk arrays</td>
</tr>
</tbody>
</table>
| | | • Integrated remote management | | Features identical for all models:
| | | | | • Windows Storage Server 2003 operating system
| | | | | • CIFS, NFS, NCP, MAC, HTTP, FTP support
| | | | | • Dual 10/100/1000 Mbit network cards
| | | | | • DfS migration support (with MSA1000)
| | | | | • Supported across the entire line of HP disk arrays

*Indicates the duration of the parts, onsite and labour warranties (parts-onsite-labour)
Typical NAS solutions

The following are examples of how many of our customers have used HP StorageWorks NAS solutions to solve their specific business challenges:

**Server migration/consolidation with the HP NAS 2000s**

Workstation clients and network printers

Servers running Windows, NetWare or UNIX

Whether you are migrating from UNIX, NetWare or even upgrading from Windows NT 4.0, HP StorageWorks NAS solutions such as the NAS 2000s can assist in the migration or even replacement of servers in any environment.
HP StorageWorks NAS products are the right solution for heterogeneous file serving as they can be used as single file storage for CIFS, NFS, AppleTalk, NCP (Netware), HTTP and FTP. This also helps when migrating from one platform to another. Print serving completes the capabilities of HP NAS in these environments. Details of the file-serving protocols listed above can be found in the Q&A section of this guide.
The HP StorageWorks NAS 1200s can easily be used to deploy file serving at remote sites. Added features such as storage mirroring can replicate data from head office and vice versa. Data can then be easily managed and backed up at a central location.
The fusion of NAS and SAN combines the best of both technologies. It enhances NAS with SAN scalability and management; and it enhances SANs with optimised file access for end-users. This unique fusion eliminates storage islands and reduces overall management complexity and costs.

This example shows an exchange server (green line) sharing the same storage source as its clients storing their Outlook PST files (blue line) or using it as client data share or personal drive (yellow line).
Which HP NAS solution is right for you?

Start

Do you require clustering capabilities?

Yes

Do you require no single point of failure to the disk array?

Yes

No

How much disk space do you require?

No

Less than 1TB

Greater than 1TB, Less than 27TB

Greater than 27TB

How many concurrent users?

Less than 100

Between 100 and 500

Greater than 500

HP NAS 1200s

HP NAS 2000s

HP NAS 4000s

If you have higher requirements, please note that HP also offers the NAS 9000s. Please contact your HP representative for more information.

Disk capacities listed in this guide are raw data capacities and do not take into account any RAID overheads that may be deployed.


Solution specific configuration

These configurations are used to give an idea on the types of systems and flexibility available from HP. Shown below is a sample bill of materials (BOM) – including hardware and software – recommended for customers ordering their first NAS solution. The standard warranty of these products is listed on page 11, however, HP also offers extended/upgraded warranty services, or Care Packs, which are listed on the page opposite.

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### HP NAS sizing example guide

#### 50 concurrent users who require 1 GB per user

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP StorageWorks NAS 1200s – model 320</td>
<td>349037-B21</td>
<td>1</td>
</tr>
<tr>
<td>Central Europe Power cord 12in.</td>
<td>157215-021</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 100 concurrent users who require 3 GB per user

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS 2000s server w/storage (584 GB usable capacity)</td>
<td>345646-421</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 300 concurrent users who require 5 GB per user

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS 4000s server</td>
<td>348936-B21</td>
<td>1</td>
</tr>
<tr>
<td>MSA1000 starter kit</td>
<td>353803-B22</td>
<td>1</td>
</tr>
<tr>
<td>146-GB pluggable Ultra320 SCSI 10k rpm universal hard drive (1 in.)</td>
<td>286716-B22</td>
<td>8</td>
</tr>
</tbody>
</table>

#### 500 concurrent users who require 5 GB per user

No single point of failure solution

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS 4000s server</td>
<td>348936-B21</td>
<td>2</td>
</tr>
<tr>
<td>NAS cluster kit</td>
<td>331474-B21</td>
<td>1</td>
</tr>
<tr>
<td>MSA1000 starter kit</td>
<td>353803-B22</td>
<td>1</td>
</tr>
<tr>
<td>MSA1000 HA kit</td>
<td>353804-B21</td>
<td>1</td>
</tr>
<tr>
<td>MSA30 dual bus disk enclosure</td>
<td>302970-B21</td>
<td>1</td>
</tr>
<tr>
<td>146-GB pluggable Ultra320 SCSI 10k rpm universal hard drive (1 in.)</td>
<td>286716-B22</td>
<td>15</td>
</tr>
</tbody>
</table>

### Optional NAS software

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP OpenView Storage Mirroring, v4.3 media kit</td>
<td>336246-B22</td>
</tr>
<tr>
<td>HP OpenView Storage Mirroring, Workgroup, v4.3 LTU*</td>
<td>334954-B21</td>
</tr>
<tr>
<td>HP OpenView Storage Mirroring, Advanced Server, v4.3 LTU*</td>
<td>336247-B21</td>
</tr>
</tbody>
</table>

### Notes:

- All configurations listed above use RAID 5 volumes for data
- All Storage Mirroring licences require a media kit; one licence per server node required
- Workgroup license for NAS 1200s
- *LTU = licence to use
HP Services

To help you evolve your network storage infrastructure and tackle ongoing changes, HP Services can provide you with a full range of support services. These cover the entire project lifecycle and include design, integration, data migration and ongoing support. Whether you are a novice or just don’t have the time, we can provide specific assistance to suit. Choose from a range of pre-packaged services or a completely customised project delivered by qualified and certified HP professionals or designated channel partners.

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

Available services include:

Design and integration
HP has the expertise and experience to help you create a NAS infrastructure for today’s needs, as well as future requirements. We’ll help you explore the most suitable architecture - NAS, SAN or both. And for quick and easy startup, qualified HP NAS experts can perform our installation and startup services onsite.

Data migration
HP can provide a stress-free data migration service from mission-critical HP-UX, Windows 2000, Windows NT, Sun legacy and EMC storage systems to the StorageWorks NAS or SAN platform, based on end-to-end management of the entire data-migration process.

Operate and evolve services
These range from reactive hardware and software support same-day response (8am-5pm or 24/7) to comprehensive, proactive services and mission-critical environment support.

To evolve your storage environment, and do more with less, HP offers analyses and assessments that help determine capacity utilisations, performance levels and usage, so you can plan and budget for future NAS and SAN investments.

<table>
<thead>
<tr>
<th>HP Care Pack description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS 1200s Support Plus, 3 years</td>
<td>U6385A/E</td>
</tr>
<tr>
<td>NAS 1200s Support Plus 24, 3 years</td>
<td>U6386A/E</td>
</tr>
<tr>
<td>NAS 2000s with internal storage, Support Plus, 3 years</td>
<td>U6347A/E</td>
</tr>
<tr>
<td>NAS 2000s with internal storage, Support Plus 24, 3 years</td>
<td>U6348A/E</td>
</tr>
<tr>
<td>NAS 2000s with external storage, Support Plus, 3 years</td>
<td>U6349A/E</td>
</tr>
<tr>
<td>NAS 2000s with external storage, Support Plus 24, 3 years</td>
<td>U6350A/E</td>
</tr>
<tr>
<td>Installation for NAS 1200s and 2000s series</td>
<td>U7986A/E</td>
</tr>
<tr>
<td>NAS 4000s and 9000s Support Plus, 3 years</td>
<td>U8264A/E</td>
</tr>
<tr>
<td>NAS 4000s and 9000s Support Plus 24, 3 years</td>
<td>U8265A/E</td>
</tr>
<tr>
<td>Installation and Startup Service for Enterprise NAS</td>
<td>U9521A/E</td>
</tr>
</tbody>
</table>

Note: Support Plus provides hardware and software support during standard business hours, Monday to Friday. Support Plus 24 provides hardware and software support 24 hours a day, every day of the week.
Your questions answered

Q: What is the advantage to the HP StorageWorks NAS over a general-purpose file and print server?

A: The HP StorageWorks NAS portfolio has been designed to serve files to heterogeneous clients. In addition to performance tuning, HP StorageWorks NAS includes integrated software designed to support a multi-vendor operating system environment, and snapshot and data replication capabilities.

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

A: The HP strategy for NAS backup is designed around 'customer choice'. The NAS systems that HP provides can integrate into your existing backup strategy if using the following backup products:

- HP OpenView Data Protector
- Atempo Time Navigator
- Bakbone Netvault
- CA Brightstor ArcServe
- CA Brightstor EB
- CommVault Galaxy
- HP OmniBack
- Legato Networker
- SyncSort Backup Express
- VERITAS Backup Exec
- VERITAS Netbackup

The supported backup software can either be installed directly onto the NAS device for direct data backup, or the relevant Windows agents can be installed and managed remotely.
HP also supports either direct SCSI-attached tape devices or network/SAN-attached tape devices. SAN-attached is recommended for multiple NAS devices and NAS/SAN fusion products provided by HP (i.e., the 4000s). A SAN-attached backup matrix can be found at:
www.hp.com/eur/ebs

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

A: Again, the HP strategy for anti-virus is 'customer choice'. HP StorageWorks NAS devices support the following products:
- MacAfee Net Shield
- Symantec Norton AntiVirus
- Trend Micro ServerProtect
- Sophos Anti-Virus

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 NAS systems 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. Try to segment NAS traffic, and/or add additional network controllers to the NAS system as required. You can also improve performance by reducing CPU cycles managing the TCP/IP stack in the operating system – to help you achieve this, HP recommends the TCP Offload Engine (TOE) network card from Alacritech. Note: the NAS 1200s cannot be upgraded, and should be deployed with future requirements in mind.

Q: How does HP OpenView Storage Mirroring work?

A: HP OpenView Storage Mirroring replicates data from one HP NAS system to another over a TCP/IP network. After the initial replication of all the required data, only changes to the particular file are then replicated to the other system. This reduces required network bandwidth and avoids having to resend the whole file. Storage Mirroring can also be scheduled for particular times or be configured to utilise a percentage of network bandwidth for greater flexibility.
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 then cause disk space to be used. 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: What is the benefit of snapshotting technology?

A: Snapshotting technology allows you to easily backup duplicated data without affecting the performance of the original volume. Moreover, it can significantly reduce data restore times - as data can be rolled back to the original volume, using disk rather than tape. With the integrated snapshotting feature in Windows Storage Server 2003, users can now restore deleted files from their desktop without involving the IT department.

Q: Why should I buy a NAS solution from HP?

A: HP provides a range of NAS storage products to meet all your needs. We believe our extensive NAS portfolio provides outstanding price/performance versus the competition. HP is the worldwide leading provider of disk storage systems, external storage systems, tape drives and automation, storage area networks and virtualisation technology.

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 of these protocols allow machines to mount a disk partition on a remote machine as if it were on a local hard drive.
Jargon buster

**DAS (Direct Attached Storage)**
A deployment of dedicated storage devices for each server. Disadvantages include inefficient storage use and allocation, and multi-vendor storage and management interfaces.

**SCSI (Small Computer System Interface)**
Protocol used to communicate with SCSI devices; also used by fibre channels to communicate with disk drives.

**DTS (DAS to SAN technology)**
An exclusive HP feature that provides quick and easy data migration from SmartArray and RA 4100 devices to an MSA1000 Disk Array.

**SAN (Storage Area Network)**
A high-speed, special-purpose network that connects different storage devices with associated servers. It can provide backup and archival storage for multiple or even remote locations.

**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.

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

**CIFS, NFS, NCP, MAC, HTTP & 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.

**LAN (Local Area Network)**
A network within the confines of a building typically based on Ethernet.

**WAN (Wide Area Network)**
A network spanning the boundaries of one building to another over long distances - even across countries.

**Fibre channel**
Like Ethernet, the topology and transport protocol used to send block-level data information between server and storage.

**RAID**
RAID – Redundant Array of Inexpensive Disks, the ability to group disks as if there were one physical unit and also provide redundancy within that disk group i.e., mirroring data.

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

**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, 4 NAS servers = 4 cluster node.

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

**Quota management**
Restricts how much data can be stored on a volume or file share, preventing disk space from reaching zero.
HP StorageWorks NAS solutions have already helped these satisfied customers manage their data more efficiently. Contact HP today, to see how we can help you too.

"The HP StorageWorks NAS 2000s has enabled our company to consolidate data storage and servers into one, manageable device. In addition to being quick and simple to install, the NAS 2000s offers multiple management options that allow us to choose the best management tool for the task at hand."

Julian Morris, SVP and Director of Information Technology, DraftWorldwide Inc

"Our customers are faced with having to do more with less in today’s demanding IT environment, and the new Windows-based HP StorageWorks NAS appliances fulfil that requirement and more.... low cost server/storage consolidation coupled with significant file-server performance optimisation, remote management functionality, not to mention file and print capabilities!"

Ray Parvaresh, Technical Advisor, CorpInfo Services

"The new Microsoft Windows Storage Server 2003 with HP NAS products offers significant advantages over the existing Windows Powered NAS, at a low cost."

Steve Schuldt, Vice President, Corporate Sales, CDW

"We selected HP StorageWorks NAS because the cornerstone of our business is rich media, and HP proved to be the best match for our data protection needs today, and will also allow us to extend the system on-the-fly, as our business grows."

Paul Court, Head of Infrastructure, Premium TV