

# Easy as NAS

The next step in networked storage with HP ProLiant storage servers.



## HP ProLiant storage servers – the single solution for file and print serving, plus application storage

HP ProLiant storage servers are Network Attached Storage (NAS) solutions that provide both dedicated file and print serving and application data storage. This dual capability, enabled by iSCSI functionality, provides true storage consolidation, without the need for investment in a full SAN.

As part of the Easy as NAS initiative, this poster provides a useful technical overview of the full portfolio of HP ProLiant storage servers. It also explains how the different models can be typically configured and deployed in real-life business environments. Plus, it outlines the complementary support offerings from HP Services – which provide a complete end-to-end solution.

## HP ProLiant storage server family

HP ProLiant storage server	ML310 Storage Server			DL100 G2 Storage Server			ML350 G4 Storage Server		ML370 G4 Storage Server		DL380 G4 (standalone)			DL380 G4 (SAN)	DL585 Storage Server
	320-GB model	640-GB model	1-TB model	320-GB model	640-GB model	1-TB model	Base model	Internal SCSI model	Base model	High Performance model	Base model	External SCSI model	External SATA model	Gateway model	Gateway model
Part number	367984-421	367985-421	367986-421	367987-821	367988-821	367989-821	375637-421	375638-421	375639-421	375640-421	371224-821	371225-821	371226-821	371227-821	348937-822
<b>Hardware features</b>															
Processor	Intel® Celeron® 2.66GHz	Intel Pentium® 4 2.80GHz	Intel Pentium 4 3.20GHz	Intel Celeron 2.80GHz	Intel Pentium 4 2.80GHz	Intel Pentium 4 3.20GHz	Intel Pentium 4 3.00GHz	Intel Pentium 4 3.20GHz	Intel Pentium 4 3.40GHz	Intel Xeon™ 3.06GHz	Intel Xeon 3.06GHz	Intel Xeon 3.06GHz	Intel Xeon 3.06GHz	Intel Xeon 3.20GHz	Intel Xeon 2.80GHz
No. of processors (standard/max)	1/1	1/1	1/1	1/1	1/1	1/1	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	2/4
Memory (standard/max)	256-MB / 4-GB	512-MB / 4-GB	1-GB / 4-GB	512-MB / 4-GB	512-MB / 4-GB	512-MB / 4-GB	1-GB / 4-GB	1-GB / 4-GB	2-GB / 4-GB	1-GB / 4-GB	1-GB / 4-GB	1-GB / 4-GB	1-GB / 4-GB	2-GB / 8-GB	4-GB / 8-GB
No. of PCI-X slots	3	3	3	0	0	0	4	4	4	3	3	3	3	3	6
No. of PCI slots	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0
No. of Gbit NIC ports (autosensing)	1	1	1	2	2	2	1	1	1	2	2	2	2	2	2
iLO support	N/A	N/A	N/A	N/A	N/A	N/A	*	*	*	*	*	*	*	*	*
TOE card support	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<b>Operating system features</b>															
Clustering	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*	*
Shadow Copy of Shared Folders	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quota Management	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
File Service	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Print Service	• (optional)	• (optional)	• (optional)	*	*	*	*	*	*	*	*	*	*	*	*
File Sharing Protocols (CIFS, NFS, AppleTalk, etc.)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Multipathing (SecurePath)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*	*
Client licensing included	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Web-enabled management	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3 <sup>rd</sup> party agent support	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<b>Software options</b>															
HP Open View Storage Mirroring	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
iSCSI Feature Pack base product	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (gateway edition)	• Individual qualification required
iSCSI Snapshots	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (gateway edition)	• Individual qualification required
iSCSI Clustering	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	• (gateway edition)	• Individual qualification required
iSCSI Direct backup	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (standalone edition)	• (gateway edition)	• Individual qualification required
Microsoft Windows® Storage Server™ 2003 Feature Pack for Exchange 2003	*	*	*	*	*	*	*	*	*	*	*	*	*	N/A	N/A
Data Protector including Call Manager	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<b>User storage</b>															
Default user storage (raw)	320-GB	640-GB	1-TB	320-GB	640-GB	1-TB	none	1.2TB (4x300-GB)	none	none	none	1.2TB (4x300-GB)	1-TB (4x250-GB)	none	none
Max. internal user storage (raw)	320-GB	640-GB	1-TB	320-GB	640-GB	1-TB	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)	1.2TB (4x300-GB SCSI)
Max. user storage (raw)	320-GB	640-GB	1-TB	320-GB	640-GB	1-TB	4.8-TB	10.2TB	10.2TB	24.5-TB (SCSI)/ 36.5-TB (SATA)	24.5-TB (SCSI)/ 36.5-TB (SATA)	24.5-TB (SCSI)/ 36.5-TB (SATA)	FC Fabric limit	FC Fabric limit	FC Fabric limit
Direct attached or SAN-attached	direct	direct	direct	direct	direct	direct	direct	direct	direct	direct	direct	direct	direct	SAN	SAN
Disk technology	SATA	*	*	*	*	*	*	• (external only)	• (external only)	• (external only)	• (external only)	• (external only)	• (external only)	• (external only)	• (external only)
Parallel SCSI	N/A	N/A	N/A	N/A	N/A	N/A	*	*	*	*	*	*	*	• (SAN connect)	• (SAN connect)
Fibre Channel/FATA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	• (SAN connect)	• (SAN connect)
<b>Misc. features</b>															
System Recovery DVD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Single point of support	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Standard warranty	1/1/1	1/1/1	1/1/1	3/1/1	3/1/1	3/1/1	3/3/3	3/3/3	3/3/3	3/3/3	3/3/3	3/3/3	3/3/3	3/3/3	3/3/3

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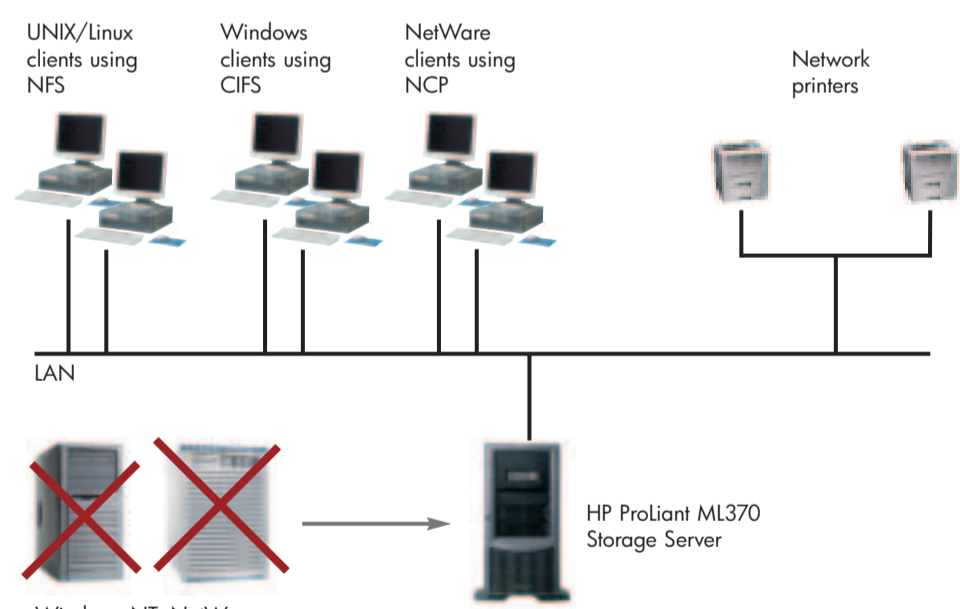
For more information about consolidating storage on HP ProLiant storage servers, order or download the Easy as NAS solution guide today at: [www.hp.com/eur/simple](http://www.hp.com/eur/simple)



## HP ProLiant storage servers at work

The following examples show how HP NAS solutions based on HP ProLiant storage servers can solve specific business challenges:

### Migrate and consolidate your file servers to an HP ProLiant storage server



- Upgrade from your current file server platform (e.g., Windows NT 4.0 or Windows 2000) to a next-generation storage server with HP ProLiant storage servers.
- Migrate other file server platforms (e.g., UNIX and NetWare) and consolidate them on HP ProLiant storage servers as well.
- HP ProLiant storage servers technology is perfect for serving clients in heterogeneous environments (Windows, UNIX, NetWare, Apple) from one single platform.
- Migration of clients from one platform to another is simple thanks to a series of easy-to-use migration tools.
- HP ProLiant storage servers can also be used as print servers, giving you a true file and print solution.
- Consolidating on HP ProLiant storage servers gives you maximum storage performance, combined with light-touch management.

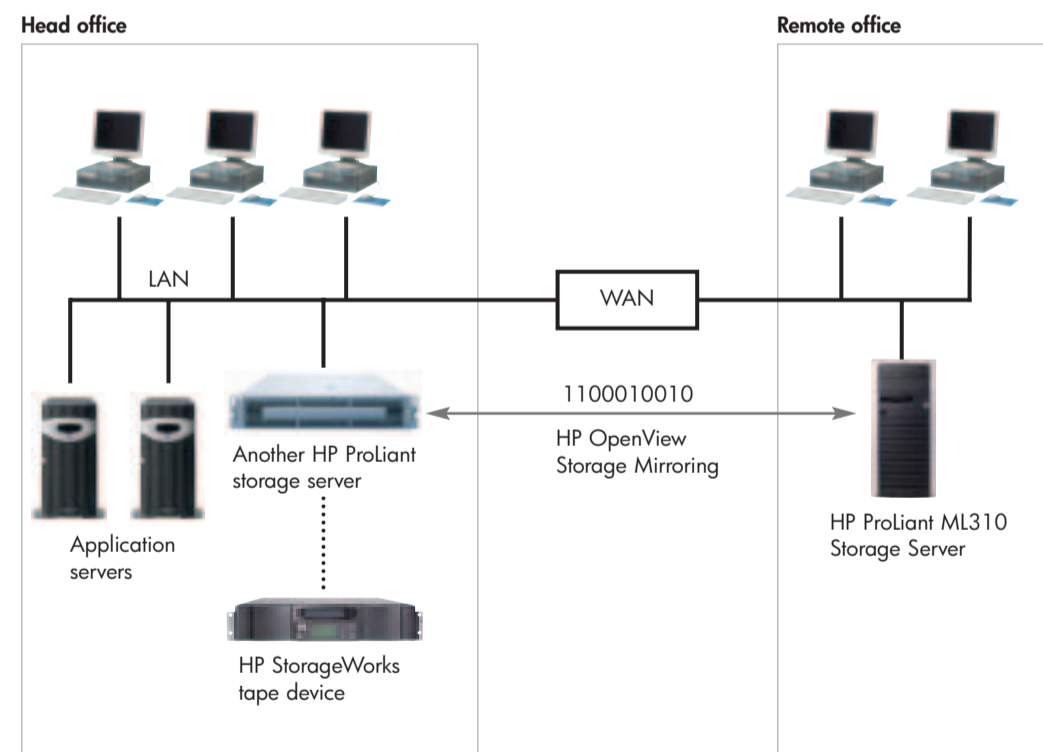
**Typical configuration**  
In this example, we consider a configuration for file and print serving based on an HP ProLiant ML370 Storage Server sized for 135 users. The total amount of usable storage required is 1.2 TB.

Solution components	Part number	Quantity	Additional information/recommendations
HP ProLiant ML370 Storage Server High Performance model	375640-421	1	Contains 2 x 36-GB mirrored OS drives and 6 x 300-GB drives for a total of 1.8 TB of raw disk storage. In RAID5, the usable data space would be 5 x 300 GB, which equals 1.5 TB.
Hot Plug Redundant Power Supply Option Kit (EURO)	356544-021	1	For power redundancy. Should be connected to a separate power phase.
NC7771 PCI-X 10/100/1000-T Server Adapter	290563-821	1	For network redundancy.
HP Care Pack 3-year Support Plus Services for ML370	UC549E	1	For maximum availability.

Alternatively, a more cost-effective configuration can be created based on the ProLiant ML350 Storage Server Internal SCSI model, which contains one processor, less memory and hard disk drive storage, and fewer redundancy options.

If higher availability is requested, then a server cluster has to be considered (see NAS/SAN fusion example).  
Whichever configuration you choose, you must also consider a backup and restore solution. Note that in the example above, the HP ProLiant ML370 Storage Server has no internal space left for tape drives, therefore you should consider an external solution.

### Manage and back up your branch office file servers via remote replication



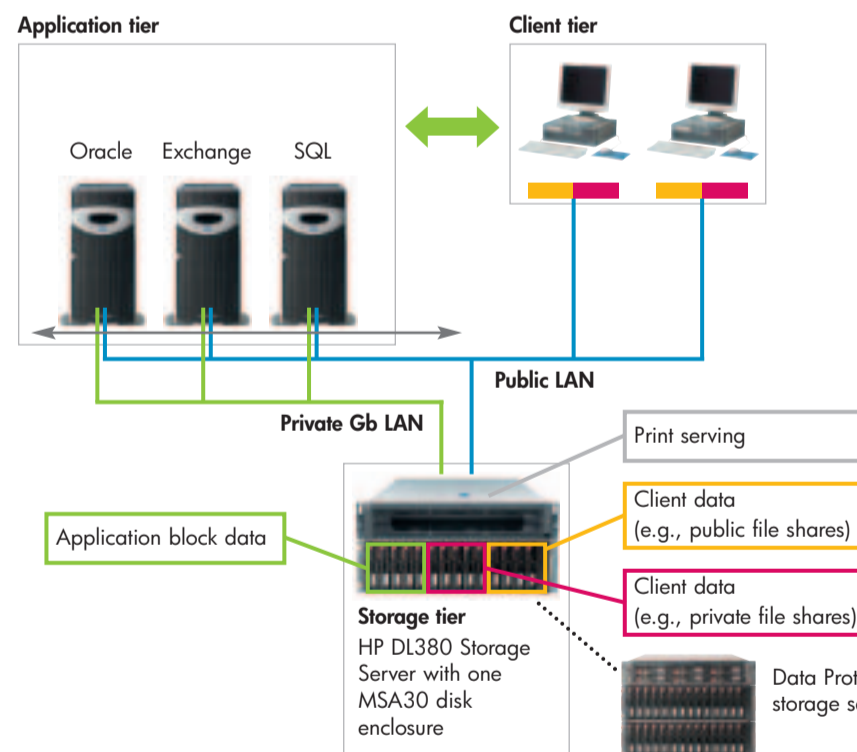
- Thanks to simple remote manageability, HP ProLiant storage servers can easily be used to deploy file serving at remote sites.
- You can replicate data between a central office and branch office locations with HP OpenView Storage Mirroring software, and thereby benefit from both centralised server administration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

**Typical configuration**  
In this example, we consider a configuration for file and print serving in a remote location based on an HP ProLiant ML310 Storage Server sized for 20 users. The total amount of usable storage required is 500 GB. The data contained in the ML310 is mirrored on the NAS server located at the central site.

Solution components	Part number	Quantity	Additional information/recommendations
HP ProLiant ML310 Storage Server 1-TB model	367985-421	1	Contains 4 x 250-GB drives for 1 TB of total raw SCSI disk storage. In RAID5, the available space is 750 GB.
NC7771 PCI-X 10/100/1000-T Server Adapter	290563-821	1	For network redundancy.
HP OpenView Storage Mirroring Workgroup NAS Edition LTU 1	344954-821	2	This software replicates data on the ML310 to the NAS server located in the central data centre. 1 licence to use per server. No tape-based backup solution is needed as the backup is performed by the central NAS server.
HP Care Pack Hardware Installation and Startup	U7986E	1	Required because the remote site has no local IT professional to perform the installation.
HP Care Pack 3-year Support Plus Service for ML110	UB940E	1	Provides the right level of support for a storage mirroring environment.

No additional processors or hard disk drives can be added to this ML310 model. However, further options are available (e.g., UPS).

### Unify your application data storage and file serving with the iSCSI Feature Pack



- Use HP ProLiant storage servers with the iSCSI Feature Pack for true storage consolidation in small to medium environments.
- Store your application server data 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 server infrastructure technologies.
- Application data and storage data is separated into different tiers to provide optimised performance for each.
- In this scenario, two 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.

**Typical configuration**  
In this example, we consider a configuration based on an HP ProLiant DL380 Storage Server sized for iSCSI-based application serving. Direct attached SCSI is shown here (as opposed to SAN-attached SCSI). The total amount of usable storage required is 3 TB.

Solution components	Part number	Quantity	Additional information/recommendations
HP ProLiant DL380 G4 Storage Server External SCSI model	371225-821	1	Contains 1 processor, 1 GB of memory, 1 MSA30 with 4 x 300-GB SCSI hard disk drives.
Intel Xeon X3.4-GHz/1-MB/800-MHz Processor Option Kit	311583-821	1	Provides a second processor.
1 GB of SDRAM DIMM Memory Kit (2 x 512 MB)	343056-821	1	To reach a total of 4 GB of memory.
2 GB of SDRAM DIMM Memory Kit (2 x 1 GB)	273914-821	1	To reach a total of 4 GB of memory.
Smart Array 6404/256 Controller	302969-821	1	For the external drives.
HP StorageWorks MSA30 SB 14 Drive Enclosure	302969-821	1	A second external disk enclosure – each of which will host 7 drives for better performance and scalability.
300-GB HDD SCSI	350964-822	10	Expands this configuration to 14 hard disk drives in total. RAID5 within each MSA30 provides 6 x 2 x 300 GB for 3.6 TB of capacity.
HP Care Pack for Hardware Installation and Startup	U7986E	0	Not needed for this configuration, as the company has dedicated IT professionals to provide installation.
HP Care Pack 3-year Support Plus 24 Service	UC574E	1	Ensures maximum availability.
HP ProLiant storage server iSCSI Feature Pack – Standalone Edition	T3669A	1	For application data storage.
HP ProLiant storage server iSCSI Snapshots – Standalone Edition	T3671A	1	For enhanced backup capabilities.

Further options are also available (e.g., UPS).

Note: the HP ProLiant DL380 Storage Server has no internal space left for tape drives, except for a hot-pluggable tape drive space which is too small for 3 TB of storage. Therefore, an external backup and recovery solution should be considered.

## Enhance your solution

### iSCSI options

#### HP ProLiant storage server iSCSI Feature Pack

This software adds iSCSI target functionality to HP ProLiant storage server devices designed for small and medium business environments. The result is an affordable storage platform that delivers file, print and application storage services over existing Ethernet networks. It includes HP Application Storage Manager, which delivers radically simple application storage management for Microsoft Exchange Server 2003.

With the iSCSI Feature Pack, HP ProLiant storage servers can host Microsoft Exchange Server (2000/2003) data stores and Microsoft SQL Server 2003 or Oracle 8i, 9i and 10g database stores. An iSCSI initiator has to be installed on each application server accessing the data hosted by the ProLiant storage server.

#### Snapshots for iSCSI Feature Pack

Snapshots provide protection against accidental deletions, file corruptions and virus attacks by creating point-in-time copies of the data on your storage server. Delta changes are replicated with 100% integrity, and the resulting space-efficient snapshots can be accessed instantly via the Microsoft Volume Shadow Copy Service (VSS) interface.

### Direct Backup for iSCSI Feature Pack

Direct backup functionality allows administrators to perform backups directly from a storage server to a tape drive without involving the application server. This reduces load on the application server and also on network traffic.

### Clustering for iSCSI Feature Pack Gateway Edition

Upgrading the iSCSI Feature Pack (Gateway Edition only) with clustering services enhances the availability of your storage server. It uses the Microsoft Cluster Services feature to activate two-node iSCSI target capability, and eliminates single points of failure by adding redundant features such as dual network connections and dual I/O channels.

### Storage mirroring

HP OpenView Storage Mirroring is a host-based application that performs remote copy over an IP LAN or WAN for near real-time full application or file recovery replication. Perfect for environments that do not have a high-bandwidth Fibre Channel network, or a requirement for high-capacity replication and zero-downtime service levels, storage mirroring provides a very cost-effective disaster-recovery alternative. It offers replication from one host to another within a LAN, storage centre or direct attached storage, and between metro offices and regional centres. Key features include asynchronous replication – which can be scheduled to a fine granular level such as the Logical Unit Number (LUN), file or byte level – and multiple replication configuration options, including peer-to-peer and many-to-one.

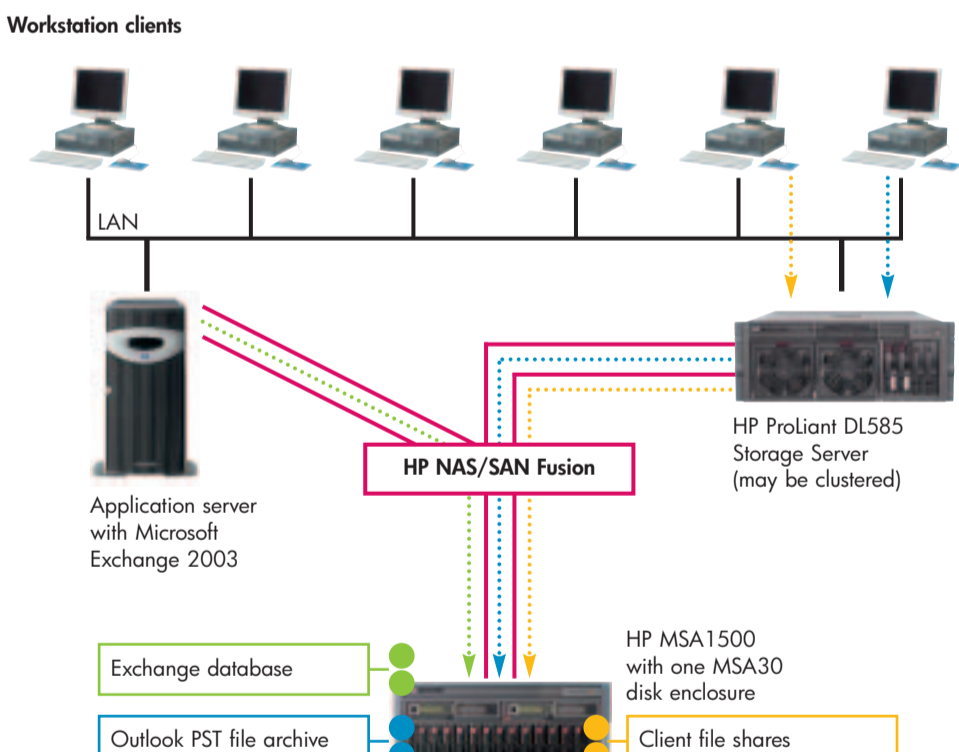
### HP Care Pack Services for ProLiant storage servers

Name	HP ProLiant storage servers						
	HP ProLiant ML310 (standalone)	HP ProLiant DL100 (SAN)	HP ProLiant ML350	HP ProLiant ML370	HP ProLiant DL380 (standalone)	HP ProLiant DL380 (SAN)	HP ProLiant DL585
HW Installation	U7986A/E	U7986E	U7986E	U7986E	U7986E	U7986E	U7986E
3-year Support Plus Service	UB940A/E	UC555E	UB995E	UC549E	UC573E (Base model: UC561E)	UC561E	UC581E
3-year Support Plus 24 Service	UB941A/E	UC556E	UC544E	UC550E	UC574E (Base model: UC562E)	UC562E	UC582E

\*HW Installation & Startup

To learn more about the full range of HP Services offerings, visit [www.hp.com/hps/carepack](http://www.hp.com/hps/carepack)

### Integrate HP ProLiant storage servers to your SAN environment with NAS/SAN fusion

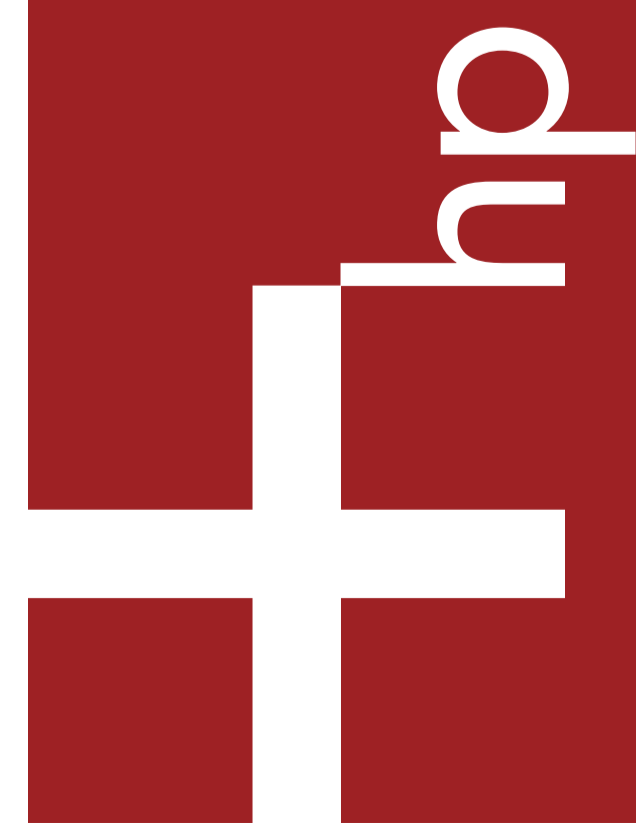


- Just as application servers can store their data in a SAN, leverage the advantages of a SAN: pooled storage capacity, central management, high availability and integrated backup and recovery procedures.
- This unique fusion eliminates storage islands and reduces overall management complexity and costs.
- The example here shows a Microsoft Exchange Server (red line) sharing the same storage source as its clients using 11 as client data share (blue line) or personal drive (yellow line).

**Typical configuration**  
In this example, we consider a NAS/SAN fusion configuration based on a cluster of two HP ProLiant DL585 Storage Server (SAN) models sized for 250 users, together with an HP StorageWorks MSA1500 SAN solution and 4.2 TB of raw storage space.

Solution components	Part number	Quantity	Additional information/recommendations
HP ProLiant DL585 G4 Storage Server SAN model	348937-821	2	Each server contains 2 x 36-GB mirrored OS drives, 2 processors and 4 GB of memory.
2-GB PCI-X HBA	A7388A	4	Each server requires 2 host bus adapters for connection to the SAN switch.
Single slot NIC	313881-821	2	For cluster information.
HP StorageWorks SAN Switch 2/8V	AA797A	2	For higher redundancy.
LC/UC Fibre Channel Cable 5m	221692-822	6	For higher redundancy.
HP StorageWorks MSA1500 Controller Shell	AA786A	1	
HP StorageWorks MSA1000/1500 Controller	21823-1822	1	
HP StorageWorks MSA30 SB 14 Drive Enclosure	302969-821	1	
300-GB HDD SCSI	350964-822	14	RAID5 provides 6 x 2 x 300 GB for 3.6 TB of capacity.
HP StorageWorks NAS Cluster Kit	331474-821	2	One per server.
HP Care Pack for Hardware Installation and Startup	U9521E	2	One per server.
HP Care Pack 3-year Support Plus Service	UC581E	2	One per server.

Further options are also available (e.g., UPS).



# Easy as NAS

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[www.hp.com/eur/easyasnas](http://www.hp.com/eur/easyasnas)