SIMPLIFIED
Data Storage

Looking for a data storage solution that is easy to integrate, rapid to scale, simple to manage and high on safety?

Turn to HP Storage. Our cutting edge Storage Technology epitomizes all this and more.
Importance of Data, The Lifeline of your Business:
Operate more efficiently. That’s the order of the day for government organizations, but obstacles are everywhere. Whether your organization is large or small, data is critical to your operations. In fact, it is at the very heart of any business – and there’s more of it than ever. Storage is growing at more than 30 percent annually. Utilization rates are under 50 percent. Power and cooling costs account for 25 percent of the budget. In fact according to IDC, the volume of data doubles every year.

The problem is, how do you handle this explosive growth? How can you be sure you can access your data quickly? And how do you back it up in case of any emergency, disaster, power outage or audit that goes back five years. There are so many confusing choices for data protection and storage solutions, so many buzzwords and so much jargon-filled tech-speak – and so little guidance on which solution is the right choice to meet your business objectives.

Unlike other corporations that often have extensive resources, such as specialists dedicated exclusively to storage efforts, you may not have the time, resources, or available expertise to develop effective, long-term storage strategies.

We at HP Storage understand the need for comprehensive, yet easy to implement solutions that bridge the gap between your ever-increasing data storage requirements and the capabilities of your IT infrastructure.

Helping you meet your Storage Challenges:
As your business grows and evolves, there are two significant areas where HP can help you develop a comprehensive storage management strategy. First, you can improve efficiency by consolidating storage into centralized and high-performance storage arrays and file/print serving solutions. Second, because data is the lifeline of today’s business, you must make sure that data is safe and secure. Moving towards multi-tier backup strategies that utilises both disk and tape can vastly improve your recovery points and recovery times.

Regardless of your storage challenges, HP has a set of products, services and expertise to help you choose and deploy a complete server and storage solution designed for your business applications, and with your unique needs in mind.

Storage technologies at a glance:
Before we dive into the details of the various storage technologies, it’s important that we take a high-level look at the available types of storage and data protection paradigms.

Online Storage:
Storage for information that is regularly used by clients and servers is often referred to as online storage. Online storage is typically placed in one of the two categories – file or block – depending on how it is accessed and used.

Why HP Storage?
Storage technology can be confusing, with numerous niche suppliers, each highlighting a specific technology approach, strategy, or interconnect option. Instead of approaching your challenge from a narrow perspective, you need a strong partner with a complete set of products and experience to help you cost-effectively transform your business, improve efficiencies and select the most appropriate storage technology for your unique needs. HP understands that storage should be a resource to enable your business outcomes, and must integrate into your desktop, server and business application infrastructure.

Nothing stands still for your business. It’s always your move, and technology is just part of your strategy. With HP Storage you get more than great technology - solutions that help you do more for less to manage, protect and grow your business.
on the type of data and the access method. The typical office productivity applications retrieve data as files (doc, pdf, gif, mp3, and others); is called file access. Some other applications, such as databases, virtual, machine hypervisors and e-mail that can get direct access to blocks of data without the over head of a file system; is known as block access.

It is important to remember that because different applications store and get access to data in different ways, most environments will likely need both types of data access.

Following are the available types of storage and data protection paradigms:
- Direct attached storage (DAS)
- Network attached storage (NAS)
- Storage area network (SAN)
- Hybrid or unified NAS | SAN (NAS Gateway)

**Direct Attached Storage (DAS)**

Commonly known as JBOD (Just a Bunch of Disk) this simplest type of data storage is also referred as Direct Attached Storage (DAS). By having the array directly connected to a server or multiple servers acting like an extended partition for data. This ensures that the infrastructure is more flexible and secure by segregating data and resource growth separately.

**Network Attached Storage (NAS)**

Network Attached Storage (NAS) is a storage that can help consolidate and collect data for an entire network. Client computer access to the NAS is usually through an ethernet connection. The NAS appears on the network as a single node, with its own IP address. Files stored on the NAS system are accessible to the clients on the LAN over the Ethernet connection via protocols such as CIFS/SMB (Windows clients) or NFS (Linux and UNIX), HTTP or FTP for Internet based file access.

**Storage Area Network (SAN)**

A Storage Area Network (SAN) is a storage that can cater to multiple networks allowing you to consolidate vast amounts of data from different networks across different locations and yet maintain them in one consolidated, indexed and secured fashion. By allowing data to be replicated to other SAN devices across different geographies/locations, a SAN infrastructure can also help large critical business’ prepare for Disaster Recovery setups and enable transmission of data across the globe in quick, orderly and highly secure ways. SAN devices come with controllers giving it its own intelligence to index, secure, read and write as well as replicate data making the device extremely powerful and independent. SAN is also the most rugged device with NSPOF (No Single Point of Failure) which can enable customers to have 99.999% uptime on their business.

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A storage Area Network (SAN) is a high speed network only for storage that is separate from the public LAN.
Archival or long term Storage:
It is used to keep information accessible, even when the data no longer has to be online.

Tape Based Solutions: The unique characteristic of tape makes it the foundation of a solid data protection strategy. Small and portable, tape storage allows you to keep backup copies of your data offsite, giving you protection against site-wide disasters, virus attacks, or equipment failures. Tape’s low cost and long media life also make it an effective means of long term data archival.

Tape Drives:
DAT Drives: Ideal for entry level business protection needs and combine proven reliability with a low cost of ownership.

LTO | Ultrium Drives: Are available in half and full height; the former offer simple integration with workstations and servers while retaining the capacity of traditional full height drives and the latter combine a rugged design without standing performance.

Tape Autoloaders: Designed to automate media management and the backup process, tape autoloaders are ideal for companies that:
- Want to avoid risks associated with changing tapes manually.
- Have outgrown stand alone tape drives.

Tape Libraries: For consistent, automated backup of large volumes of data (without the need for specialized resources or time-consuming processes), MSL tape libraries provide a perfect solution. They are simple to manage, fit easily into multi-vendor environments; works well with LAN or SAN and are equipped with intelligent tools to streamline backups and simplify management.

Backup Storage
It is used to restore data in the event of a disk or hardware failure in an online system. Disaster recovery is a higher level function of backup storage, often implemented across physical sites and geographies.

Disk Based Solutions: Disk-to-disk (D2D) backup can automate the backup process and make it practical to perform backups more often thus providing continuous data protection. Storing backup data on a disk-based system can result in quicker data recovery in the event of data loss.

HP Data Protection Software Products
HP provides backup and storage management software suites to suit all environments. For example, HP Data Protector Express Software is designed to protect the systems and data of single machines and small networks. For larger and more complex environments, there is HP Data Protector Software.

HP Data Protector Software: HP Data Protector Software permits rapid, automated and efficient backup and recovery over unlimited distances, from either disk or tape. It integrates fully with HP SAN solutions for a high level of business continuity and availability. Furthermore, HP Data Protector Software allows you to reduce backup windows, and it secures high availability of data and systems by providing fully integrated Zero Downtime Backup and Instant Recovery.

Data Protector 6.0 software provides:
- Virtual full capability: reduces time and resources needed to perform full backups, and improves tape utilization with ‘pointers’.
- Instant, automated e-mail recovery: permits mail services to continue during backup and enables extremely fast recovery of terabytes of e-mail data.
- Data encryption: encrypts data using 256-bit Advanced Encryption Standard (AES), which helps protect data from unauthorized access and helps backups meet the compliance and regulatory requirements of government departments and financial institutions.

Storage is easy when you choose HP
Select from the following business needs listed to help us guide you to the right set of products and solutions.
### EVA6400 (FC Based Storage)
- **RC Item No.:** 1
- **RC PRICE:** Rs. 3,072,000*

**Features:**
- Dual redundant active active fiber channel controller for increased fault tolerance.
- Upto 96 hours of cache battery backup
- Array designed to give upto 5 9’s of availability*
- Support for heterogenous operating system including windows, linux, hpux, aix, solaris, VMware, citrix, mac OS
- Industry leading disk virtualisation provides easy of management, efficient capacity utilisation with optimised performance for mixed workloads
- End of End Fiber Channel Disk Storage Array
- Support for FC, iSCSI & FCoE*, NAS*
- Support for solid state, 15k RPM FC, 10K rpm FC and 1 TB FATA Drives
- Sc ability - SUPPORT up to 18 drive enclosures for a total of 216 disks in single 42 rack highest in its category
- Online firmware upgrades on disk and controller provides increased uptimes.
- Support for optional advance features like Local Copy, Remote Replication, Thin Provisioning and Online LUN/ RAID migration

### EVA4400 (FC Based Storage)
- **RC Item No.:** 3
- **RC PRICE:** Rs. 2,744,000*

**Features:**
- SAN array with dual redundant active active fiber channel controller for increased fault tolerance.
- Upto 96 hours of cache battery backup
- Array designed to give upto 5 9’s of availability*
- Easy to install and configure with the SmartStart configuration utility
- Support for heterogenous operating system including windows, linux, hpux, aix, solaris, VMware, citrix, mac OS
- Hardware based Virtual RAID (Vraid) provides improved RAID performance and the benefits of virtualization to grow and shrink RAID volumes
- Industry leading disk virtualisation provides easy of management, efficient capacity utilisation with optimised performance for mixed workloads
- End of End Fiber Channel Disk Storage Array
- Support for Fiber channel, iSCSI & FCoE*, NAS* connectivity
- Support SSD, 15k RPM FC, 10K rpm FC and 1 TB FATA Drives
- Sc ability - SUPPORT up to 8 drive enclosures for a total of 96 disks
- Online firmware upgrades on disk and controller provides much higher uptimes.
- Supports connection of up to 256 hosts.
- Support for optional advance features like Local Copy, Remote Replication, Thin Provisioning and Online LUN/ RAID migration.
- Start small and increase capacity as the business grows

### P2000 (SAS Based Storage)
- **RC Item No.:** 4
- **RC PRICE:** Rs. 859,320*

**Features:**
- Standard with 64 controller-based snapshots and clone capability.
- Support of both Ethernet and Fiber Channel interconnects provides flexible options to the application environments.
- Maximum number of P2000 LFF drive enclosures (7)
- 2 GB transportable read/write cache per controller.
- 96 drives scalability.
- 12 Drive bays.

### P2000 (SATA Based Storage)
- **RC Item No.:** 5
- **RC PRICE:** Rs. 825,660*

**Features:**
- Standard with 64 controller-based snapshots and clone capability.
- Maximum number of P2000 LFF drive enclosures (7)
- 2 GB transportable read/write cache per controller.
- RAID LEVELS 0, 1, 3, 5, 6, 10, 50
- Support for wide variety of drives: enterprise-class SAS, SAS Midline, and archival-class SATA Midline in either P2000 LFF 3.5-inch or HP ProLiant SFF 2.5-inch drives.
- Upto 7

### DISK TO DISK BACKUP D2D 4000
- **RC Item No.:** 10
- **RC PRICE:** Rs. 1,404,000*

**Features:**
- D2D Backup Systems allow you to retain daily backup data on disk, providing ready access to backup sets for rapid restores.
- HP D2D Backup Systems work with your backup application to help automate and improve the backup process while reducing the time spent managing data protection.
- Implementing unattended daily backup is especially valuable for environments with limited IT resources.
- D2D Backup Systems include hardware-based RAID 5 or RAID 6 to reduce the risk of data loss due to disk failure

* Price subject to change without prior notification. Please refer Rate Card
**Jargon buster – glossary**

The following is an abbreviated look at storage concepts.
If you are already familiar with these terms, you may simply want to use this
list as a quick reference. If you are new to storage, you can refer to these
definitions as you read through the brochure.

- **Block I/O** – I/O requests to disc storage on a DAS or SAN
- **Block storage** – disc storage that is divided into a sequence of fixed-size data
  blocks to which access is through read or write actions, one block at a time,
  on the storage media
- **Common Internet File System (CIFS)** – a file-sharing protocol used in Windows
to map client PCs to file shares on servers or NAS devices; also known as a
server message block (SMB)
- **Deduplication** – advanced method of eliminating redundant data by referenc-
ing existing blocks of data that have previously been stored, storing only data
that is both new and unique, thus greatly reducing storage requirements
- **Direct attached storage (DAS)** – storage either inside or attached directly to
  a server, through external hard drives or tape drives and shared with the
  workstations
- **Failover** – a backup operation that automatically and transparently switches
to a standby database, server or network if the primary system fails
- **Fibre Channel (FC)** – fast, low-latency topology and transport protocol de-
signed to send block-level data information, specifically for storage networks
- **File I/O** – input/output requests to disc storage on a NAS device or file
  system on a general-purpose server
- **File storage** – disc storage in the form of data as it is used by applications
  and end users
- **I/O** – short for input/output; any program, operation or device that transfers
  data to or from a computer or peripheral device
- **iSCSI** – short for Internet SCSI; a simple and industry-standard method of con-
  necting servers and storage over an Ethernet network
- **Mirroring** – the act of copying data from one location to a storage device in
  real time, ensuring an exact copy of the original information
- **Network attached storage (NAS)** – dedicated file server (also called a ‘NAS
device’) optimised for file-serving performance and accessible using special-
ised access/sharing protocols
- **Network File System (NFS)** – a file-level protocol, usually associated with
  UNIX and Linux, to access and potentially share data
- **NetWare Core Protocol (NCP)** – a file-level protocol associated with Novell
  NetWare
- **Redundant array of independent discs (RAID)** – a method of simultaneously
  writing data over multiple disc drives; used in disc arrays to enhance data
  protection and performance Storage area network (SAN) – a high-speed
  network that connects different data storage devices to servers; may extend to
  multiple or remote locations for backup and archival storage
- **Serial-attached SCSI (SAS)** – also known as SAN fabric; an evolution of
  parallel SCSI, a cost-effective way to connect a small, fixed number of servers
directly to a storage device
- **Serial ATA (SATA)** – a serial link, single cable creating a point-to-point con-
  nection between devices
- **Snapshot** – a virtual copy (not an actual copy) of data that imitates the way it
  looked at the precise time the snapshot was taken
- **Unified Network Storage** – a combination of NAS and SAN (generally IP
  iSCSI-based) that provides both file and application storage capabilities

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**HP Genuine Accessories**

- RC item No. 18: HBA, Single Port Fibre Channel Rs. 44,325*
- RC item No. 19: HBA, Dual Port Fibre Channel Rs. 67,965*
- RC item No. 34: SAN Switch 8 Port Fiber channel Rs. 2,81,061*
- RC item No. 35: SAN Switch 16 Port Fiber channel Rs. 5,29,320*

**Data Backup Software**

- RC Item No. 6 : Data Back up Software for 10 Server, (Windows/Linux) Rs. 498,368*
- RC Item No. 7 : Data Back up Software for 10 Server, (Unix) Rs. 1,126,455*
- RC Item No. 8 : Data Back up Software for 20 Server, (Windows/Linux) Rs. 904,805*
- RC Item No. 9 : Data Back up Software for 20 Server, (Unix) Rs. 1,872,296*

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Looking for a data storage solution that is easy to integrate, rapid to scale, simple to manage and high on safety? Turn to HP Storage. Our cutting edge Storage Technology epitomizes all this and more.

Simply put, virtualization means pooling and sharing of resources. This process should be so simple and so easy that it brings the workforce to far higher efficiency and utilization levels which help in reducing cost – that is the key driver says Prakash Krishnamoorthy. Virtualization of storage breaks the physical limitations of how many drives make a disk group by simply taking control of all the drives as one consolidated capacity. After that they write an algorithm or management console that allows them to use all the capacity as they want as if there is no wall. Virtualization brings real tangible benefits, benefits of manageability while reducing administration cost, better asset utilization thus improving efficiency in public IT spending. Ultimately this will also help unleash the full potential of virtualization, private & public clouds.

For Configuration details, more information as well as to place orders please feel free to call us anytime.

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