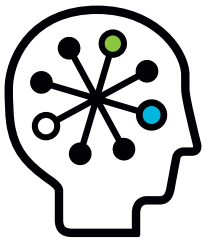
HP LeftHand SANs and Microsoft® SQL Server 2008

Solution brief



At a glance

Microsoft SQL Server needs a storage infrastructure as powerful and flexible as it is. No matter how much the databases grow and change, an HP LeftHand SAN can easily accommodate the demand—without add-on products, complex procedures, high-priced consultants, or months of training. You can change, scale, and protect the storage environment on the fly to accommodate virtually anything the SQL Server DBAs throw at it.

Introduction

Microsoft SQL Server is today's fastest-growing database environment, with over 75 percent of enterprises using the product—and running the type of business-critical applications that once were the exclusive domain of Oracle and DB2. Storage plays a key role in any major database environment. Because reliability, availability, data protection, scalability, management, and security all depend on the underlying storage, SQL Server must reside on an affordable storage subsystem that delivers enterprise-class storage management to meet growing business requirements.

Capacity planning is the database administrator's first challenge. How much storage does the system need? What is the growth rate of all databases? How much data protection is required? How will storage be allocated to new applications? Because re-provisioning storage leads to expenditures of both time and money, it is consistently cited as the primary pain point in dealing with changes to an existing SQL environment.

Performance management can also be a challenge as SQL Server databases are notoriously I/O bound, causing poor application performance and lowered productivity. Adequate storage performance is usually a matter of having sufficient "spindles" (disk drives) to meet the I/O operations per second (IOPS) requirements for each database. Re-provisioning storage to accommodate changing performance needs results in system downtime, complex architectural changes, and—because administrative errors inevitably occur—data loss.

The third challenge, managing the SQL Server environment, requires knowledge and expertise from dedicated specialists. Unfortunately, most storage arrays require similar expertise and additional specialists. The complexities of the storage environment can slow down application deployments, delay solutions to application-specific problems, and increase the total cost of ownership of applications.

Continuous data protection, a fourth challenge, secures SQL Server data from loss and protects the applications from downtime. Data protection needs to accommodate logical loss due to errors, software defects, or malicious attacks, and from component failures. Most companies rely on tape backups, which entail backup windows—but the potential data loss and time to recover that come with tape backup are unacceptable to many. This leads to the adoption of disk-based backup products that address some problems, but often require a dizzying array of expensive add-ons that are overly complex to manage.

What is needed is a storage subsystem that is flexible enough to meet initial demands and adaptable enough to accommodate both performance and capacity changes. In addition, the ideal storage system is affordable, is highly available, does not lose data due to downtime, and supports self-recovery.

Microsoft GOLD CERTIFIED Partner

Solution overview

An HP LeftHand iSCSI SAN is the ideal storage option for an SQL Server environment because:

- It is easy to manage; there is no specific expertise in array management or storage networking required. It leverages your existing Windows® and IP expertise with implementations that require less than half a day.
- It is easy to change and expand as the SQL Server environment changes or grows. Changes require no downtime and can address both capacity and performance. Automation lowers the risk of costly administrative errors.
- It scales on the fly to any size SQL Server environment—so you will never outgrow your storage.
- It is highly optimized for SQL Server's random read/write I/O. This extracts greater performance from a set of disks and minimizes the dollars per IOPS for the system.
- It allows you to construct a highly available storage environment that survives virtually any set of component failures to keep running without affecting SQL Server users.
- It is easy to apply data protection features as needed for specific storage groups without downtime.

HP LeftHand SANs consist of multiple storage nodes, each a self-contained server with six to 15 drives. These storage nodes are clustered together to create a virtual storage array, or storage pool, from which iSCSI volumes are created. HP LeftHand SANs load-balance volume data across the storage nodes within a cluster and, using a technology called network RAID (nRAID), replicate individual blocks to different storage nodes. The storage subsystem scales with the addition of more storage nodes to the cluster. Existing volumes are automatically re-balanced to accommodate the new nodes, increasing both the capacity and the performance of the storage cluster. A performance bottleneck related to the storage subsystem can be immediately resolved by adding a node to the storage cluster. No re-planning, re-configuration, downtime, or storage expertise is required.

Additionally, nRAID provides the same level of protection between storage nodes that disk RAID provides between disks in a RAID array. Thus, if any part of a node (e.g., disks, CPU, network connections, or power) fails, other copies of the data within the SAN keep the data volumes available. Also, because of the method nRAID uses to create data replicas, multiple nodes can fail without interruption of service. In fact, physically locating half of the storage nodes in one place and the other half in another allows the system to suffer the complete failure of a location (i.e., of half the storage nodes) and still keep running.

There are no additional products to buy—and nothing to do administratively; simply put half of the nodes in a different location to get instant, multi-site failover capability. Combine this with a Microsoft Cluster Server environment for the SQL Server databases and you have a complete high-availability SQL Server environment—all at a very attractive price.

HP LeftHand SANs have a rich set of additional storage management features, including:

- Thin provisioning
- Live snapshots
- Remote snapshots between SAN/clusters
- Volume Shadow Copy Service (VSS) support
- Online upgrades of HP SAN/iQ® Software
- Automated volume growth
- Automated snapshot capacity management
- iSCSI network load balancing (via Microsoft MPIO)
- Central SAN management console with administrative access rights
- Full iSCSI security and server authentication

All these features and more are included in the base HP LeftHand SANs; there is no a la carte feature pricing. In short, HP LeftHand SANs are an outstanding, flexible, secure, and low-cost storage option for running an SQL Server environment.

The power of SQL Server and HP SAN/iQ Software

HP LeftHand SANs provide a cost-effective, easy-to-manage, highly scalable, and highly available iSCSI storage environment for use with SQL Server. The HP LeftHand SAN storage infrastructure easily expands with the addition of new databases, capabilities, or entirely new instances. HP LeftHand SANs are flexible enough to allow SQL Server to start small on a two-node SAN and scale alongside the business to a 40-node, multi-site SAN without once requiring reconfiguration of existing volumes or needing the databases to be taken offline.

About HP and Microsoft

HP and Microsoft have a strong partnership working together to provide scalable IT and business solutions for the mid-tier market. HP is a Microsoft Gold Certified Partner, a Microsoft Managed ISV Partner, and a Microsoft Storage Partner. HP is also contributing storage systems to the SQL Server Customer Lab at Microsoft corporate headquarters, where the two companies collaborate on joint customer deployments, performance testing, and best practice development.

HP Services

Partner with HP Technology Services to boost availability and avoid costly downtime by mitigating technology-related business risks. To help take the worry out of deploying, supporting, and managing your HP LeftHand SAN, we've designed a portfolio of service options that are as flexible, scalable, and affordable as our storage. For more information, talk with your HP sales representative or HP-authorized Channel Partner, or visit **www.hp.com/hps/storage**.

HP Financial Services provides innovative financing and financial asset management programs to help you cost-effectively acquire, manage, and ultimately retire your HP solutions. For more information, please contact your HP representative or visit **www.hp.com/go/hpfinancialservices**.

For more information

For more information on HP LeftHand SANs, visit **www.hp.com/go/p4000**.

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