Expand effortlessly

HP 3PAR StoreServ 7000 H-series SAN kit solution
Businesses are compelled to invest continually in their IT infrastructure to stay ahead of competition. As an organization, your access to IT resources can be limited, making it difficult to deal with growing capacity requirements that come with storage, or upgrading SAN infrastructure. You require the right-sized storage to handle new and unpredictable demands that come with virtualization, cloud, big data, or simply controlling data growth. And it’s important to do this without wasting valuable resources or requiring a storage expert to manage.

HP understands your challenges. We have developed the HP 3PAR StoreServ 7000 H-series SAN kit specifically with midrange businesses in mind making it easy to order, implement, and manage an entire SAN. We have taken the pain out of growing the IT infrastructure for midrange businesses by providing a powerful, scalable, and easy-to-manage storage networking solution. The foundation of this SAN kit is HP 3PAR StoreServ 7000 Storage.

The SAN kit includes two HP SN6000 H-series SAN Switches for high availability each with 16 device ports and 4 stacking ports enabled. They combine 8 Gb/s FC performance with end-to-end SAN management, a stackable architecture, and industry standard heterogeneous SAN connectivity to greatly simplify SAN deployment and management. These switches are designed to make SANs affordable, easy to use, and resilient as your network expands.

**Technology designed for midrange organizations**

HP 3PAR StoreServ 7000 Storage lowers compromises between affordability and Tier 1 resiliency by giving you both. It shares the same architecture and software stack with all other HP 3PAR StoreServ arrays, so you’ll not only get the same industry leading architecture, but you’ll also be able to greatly reduce your storage requirements with leading thin technologies.

Support for solid state drives, block-level storage tiering, and mixed workload optimization enable high levels of performance, so you can put more applications on the same storage to lower total infrastructure cost. Unlike traditional arrays that require you to “scale up” to support growth or increase performance, the unique, clustered, Mesh-Active architecture shared by HP 3PAR StoreServ Storage delivers capacity and performance that scales automatically, even at extremely high-capacity utilization levels. Low latency levels meet the requirements of response-time sensitive applications like Oracle Database and Microsoft® Exchange. This high-performance architecture also allows you to get more out of your VMware deployment, where extensive use of virtual memory pages to disk can limit VM consolidation on your physical server when paired with legacy storage, but not with 3PAR StoreServ solutions. In fact, HP 3PAR StoreServ Storage delivers such high performance that HP guarantees your ability to double VM density on your physical servers.¹

¹ The above is intended to highlight certain aspects of our Get Virtual Guarantee and does not contain the full terms, conditions, limitations, definitions, and other provisions (“Terms”) of the Get Virtual Guarantee. The Terms shall be contained in a written Get Virtual Guarantee Terms and Conditions, which shall take precedence over the above. Qualification for the Get Virtual Guarantee is subject to your acceptance of the Get Virtual Guarantee Terms and Conditions and your compliance with such Terms. A copy of the Get Virtual Guarantee Terms and Conditions will be provided to you by your sales representative.
**Autonomic storage**

Traditional storage provisioning is based on the physical dedication of resources in mainframe and client-server computing models. This approach is rooted in problems like inefficiency and inflexibility that virtual environments are designed to overcome. In such environments platform rigidity and provisioning complexity can lead to routine overprovisioning that detracts from storage utilization and diminishes server virtualization ROI.

HP 3PAR StoreServ 7000 Storage offers the simplest administration of any storage platform available, allowing you to reduce provisioning and management time. It enables simplified administration of VMware vSphere environments by enhancing visibility into storage resources. It also features superior granularity and control over snapshots, and rapid online recovery.

HP 3PAR Autonomic Groups is a feature of the HP 3PAR operating system (OS) to make provisioning HP 3PAR StoreServ Storage in clustered and virtual server environments even faster, simpler, and more reliable. Autonomic groups significantly reduce tedious manual repetition of commands and the number of commands required to provision storage with VMware vSphere. With the HP 3PAR Autonomic Groups feature, you create a provision of multiple volumes to multiple virtual servers quickly—the same process could take up hours or even days with traditional storage.

**Streamlining the provisioning process**

Traditional storage

![Diagram showing traditional storage provisioning process]

- A vSphere cluster of five hosts with 10 data volumes requires 50 provisioning actions on most storage arrays.
- At 10 minutes per action this could take an entire day to complete.

**Autonomic Provisioning**

![Diagram showing autonomic provisioning process]

- With the HP 3PAR Autonomic Groups feature, only three clicks and 60 seconds are needed to fully create and provision multiple volumes to multiple servers.
Get thin, stay thin

HP 3PAR StoreServ 7000 Storage enables you to meet your performance and service level objectives with fewer disks due to superior thin provisioning technologies and helps lessen administration time. Save on the cost of a storage technology refresh and increase storage ROI over time by keeping incremental purchases, administration, and operating costs low. This approach is built on thin technologies that combine both software and hardware innovations unique to HP 3PAR StoreServ 7000 Storage—making it a comprehensive approach to thin storage.

**HP 3PAR Thin Provisioning Software**

HP 3PAR Thin Provisioning Software improves storage system efficiency and increases capacity utilization system wide. It does this by addressing the problem of capacity over allocation by reducing the need to dedicate storage capacity up-front and on a per-application basis.

Since its introduction, thin provisioning has given businesses the ability to meet green IT targets and reduce capacity purchases. Thin provisioning makes this possible by cutting SAN costs, floor space requirements, and energy expenses. You are free from dedicating resources for each application or service level, and from paying for power, housing, and cooling for disks that you seldom need.

**HP 3PAR Thin Persistence Software**

HP 3PAR Thin Persistence Software enables thin volumes on the HP 3PAR StoreServ Storage to stay as lean and efficient as possible. Thin Persistence accomplishes this by reclaiming unused space associated with deleted data within system storage volumes—simply, quickly, and without disruption.

**Thin Provisioning + Thin Persistence: Average 70% capacity savings**

![Diagram showing capacity savings with HP 3PAR Thin Provisioning and Thin Persistence](image)

**HP 3PAR Thin Conversion Software**

HP 3PAR Thin Conversion Software extends the benefits of thin provisioning to your existing storage volumes for “fat-to-thin” conversions compatible with any host volume. HP 3PAR StoreServ Storage offers this built-in, hardware-accelerated, fat-to-thin conversion capability. This helps retire your legacy capacity by allowing the simple and rapid conversion of fully provisioned storage to thin provisioned storage.

**Thin Conversion: Simple and fast fat-to-thin conversion**

![Diagram showing fat-to-thin conversion process](image)
**HP 3PAR Fast RAID technologies**
This technology offers ASIC-accelerated RAID levels that deliver performance approaching that of RAID 1, but with lower RAID capacity overhead. This unique capability reduces storage capacity requirements without significantly impacting performance.

**HP 3PAR Adaptive Optimization Software**
This is a granular, policy-driven, autonomic storage tiering software solution that delivers service level customization at the lowest possible cost, while increasing agility and lowering risk. The result is highly reliable, non-disruptive, autonomic tiered storage that delivers the right QoS to the right data at the right time. This way you reduce storage equipment costs by up to 30 percent by migrating data to productive resources without manual intervention.

**Simplified SAN design**
HP SN6000 H-series FC Switches are designed to make SANs affordable and easy to use, especially as the storage network expands. A common FC Storage Area Network (SAN) design is a core-edge topology (or two tiered approach). This design connects servers to edge switches and in turn, these switches connect to core switches (or SAN directors) to provide high performance bandwidth aggregation for a 3PAR StoreServ storage array. This design is deemed necessary to provide sufficient connectivity to multiple server paths and necessary bandwidth for access to 3PAR StoreServ Storage.

*Figure 1. Traditional Core/Edge SAN Design comparing SAN Design with Stackable Switches*

The challenge with this approach is that it becomes more complex and costly as the SAN grows which may not be ideal for midrange businesses. The HP SN6000 H-series FC stacking architecture address this challenge by integrating edge and core capabilities into a single platform framework, reducing the complexity and cost of the SAN Fabric.
HP SN6000 Stackable FC switches support 20 device ports (edge) and four stacking ports (core) in a 1U configuration. The four stacking ports are dedicated for inter-switch link (ISL) communications. These native 10 Gb FC ports can be upgraded to 20 Gb FC with a software license key for even more available bandwidth between switches. The dedicated ISL ports provide the high performance FC core connectivity found in the traditional two-tier architecture and allow multiple HP SN6000 Stackable FC switches to be connected together. Additional switches and the application of licenses can be accomplished without disturbing the existing SAN environment. No reconfiguration is required and this stacking architecture allows customers to grow their SAN infrastructure effortlessly.

**High-speed ports**

The 20 device ports and dedicated stacking ports of the HP SN6000 Stackable FC switches enable the SAN administrator to build a simplified fabric, where core and edge connectivity is integrated. This means one product provides both functions. That’s one product to buy and one product to manage, which leads to more efficiency in the data center.

With up to 100 Gb/s bandwidth available through only four connections, the dedicated ISL stacking ports in the HP SN6000 Stackable FC switches are beneficial from a total cost of ownership (TCO) perspective. The stacking architecture is a much more efficient approach than using standard device ports as ISL connections. A single stacking port can provide the equivalent bandwidth of up to three device ports. This means device ports don’t have to be consumed to connect switches together and the stackable approach leaves all device ports free for their intended use.

**Reduction in switches**

One of the benefits of a stacking architecture is the efficiencies created with inter-connecting switches. Without a stacking architecture, switches need to use more ports for inter-connectivity between each other leaving fewer ports for servers and storage devices. In a stacking architecture, as more stacking switches are added, performance and scalability improve making this architecture a potential alternative to high end switch architectures. The stacked switches can be easily managed as they appear to be a single entity with one management application, one login, and can be managed as a group or individually.
Trunking
A third benefit is automated or “adaptive trunking” which is standard on all HP H-series FC switches. Trunking is a technique that increases inter-switch performance by combining multiple ISLs into one common “trunk.” With HP SN6000 Stackable FC switches, ISL trunking is automatically initiated, with no additional configuration or licenses. With “adaptive trunking” the flow of FC data between HP H-series FC switches is balanced and bottlenecks in the ISL paths are reduced.

A stackable architecture can really pay off. SAN administrators can build more efficient, high-performance SAN fabrics by implementing FC switches with a stacking architecture. The implementation and management of the combined stack is made easier for the administrator by leveraging a single management tool, simplified expansion of the fabric, and experiencing the efficiencies of the stacking architecture.

The SAN kit includes two HP SN6000 H-series SAN Switches for flexible deployment options. Two SN6000 switches can be stacked together to construct a larger SAN with more switch ports (figure 2) with an optional performance booster adding 20 Gb of bandwidth per switch, or run in parallel for a completely redundant SAN design (figure 3).

Figure 2. Scale out, large SAN

Figure 3. High Availability, redundant SAN
Spend less

With the HP 3PAR StoreServ 7000 H-series SAN kit you are spared the problem of choosing between fixed performance, scalability, simplicity, and robust features. As a midrange organization, you benefit from spending less money on storage and by considerably cutting your capacity requirements.

Take five minutes to calculate the potential three-year cost savings and ROI you can expect by from migrating from your current storage to an HP 3PAR StoreServ solution. Click here to go to the HP Storage Quick ROI Calculator.

Learn more at hp.com/go/storeserv7000

Global citizenship at HP

Developing solutions for major social and environmental challenges
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Click here to check out a video on HP 3PAR StoreServ 7000 and its features.