

Deploying HP BladeSystem c-Class and HP StorageWorks EVA in Enterprise Environments

Solution brief

HP continues to focus on delivering ways to provide enterprise-class, high-performance, yet simple and powerful solutions that consolidate operations and save time for IT professionals, allowing them to focus on critical tasks that drive business value for their companies. HP StorageWorks Simple SAN Connection Manager (SSCM) software, included with HP StorageWorks H-series (SN6000 and 8/20q) switches, is an example of such innovation by HP. By providing a complete view of the storage network from server to storage subsystem in a “single pane of glass,” SSCM delivers an end-to-end SAN infrastructure management solution for installation, configuration, zoning, provisioning, and more of the HP BladeSystem c-Class environment and HP StorageWorks Enterprise Virtual Array (EVA), H-series switches, and host bus adapters (HBAs).

Objective

Learn how HP continues to revolutionize storage area network deployment and management with the HP StorageWorks Simple SAN Connection Manager, which can cut typical startup times from days to hours and typical ongoing management tasks from hours to minutes. The benefits described in this paper are specifically tied to an HP BladeSystem c-Class and Enterprise Virtual Array (EVA) environment and the HP StorageWorks H-series (SN6000 and 8/20q) switches.

Key topics

- Explore the major components of the end-to-end HP BladeSystem infrastructure (switch, HBA) and storage solution
- Understand how to reduce installation and deployment time by more than 50%
- Experience how easy it is to provision new storage and add SAN network resources without disrupting operational environments

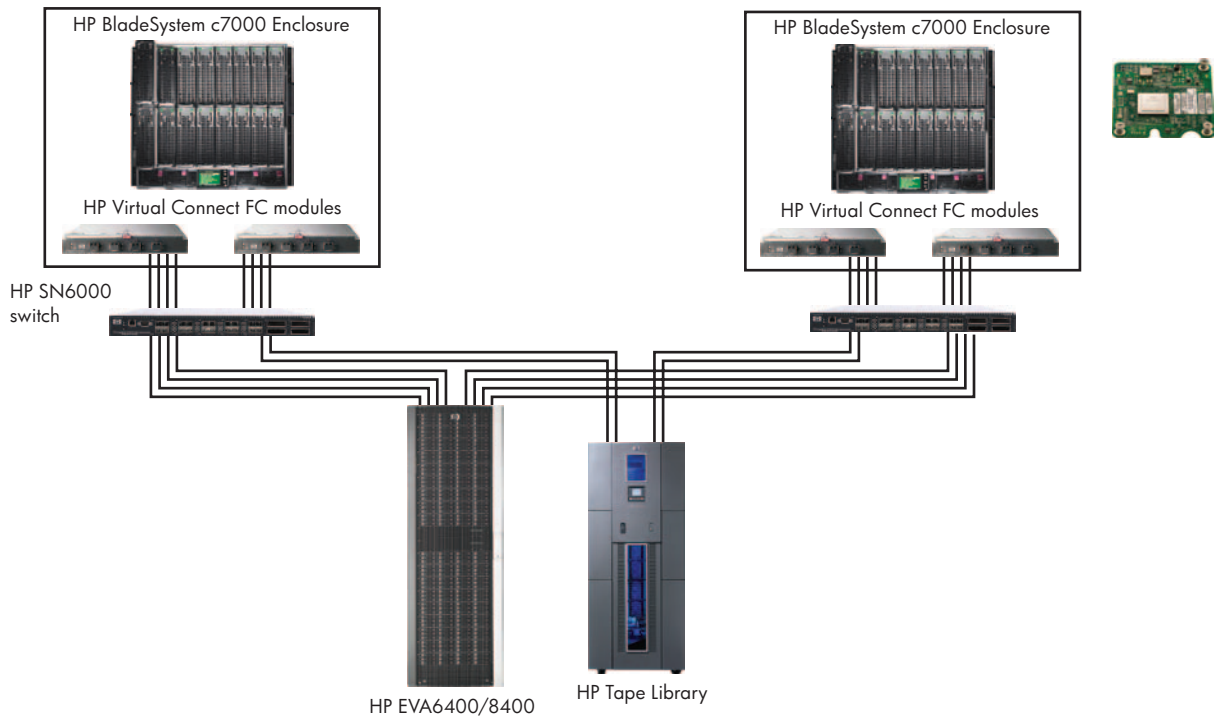
HP solution

IT managers will find that HP provides a complete solution when they deploy an HP StorageWorks EVA with Simple SAN Connection Manager and an HP BladeSystem c7000 or HP BladeSystem c3000 Enclosure. They will gain operational efficiencies by spending less time deploying and managing the SAN. The CIO and CFO will appreciate the solution’s cost and efficiency savings, and SAN administrators will benefit from its time savings.

Shown in Figure 1 is an example that consists of an HP BladeSystem c7000 Enclosure coupled with an HP StorageWorks EVA6400 or EVA8400, HP 8Gb Fibre Channel Mezzanine Cards, HP Virtual Connect 8Gb Fibre Channel Modules, and the HP StorageWorks SN6000 Stackable 8Gb Fibre Channel Switches. A single converged management application, HP StorageWorks Simple SAN Connection Manager (SSCM), is used to deploy, configure, and manage the entire SAN environment. This solution is designed to simplify tasks that IT administrators must accomplish to deploy and manage the SAN, saving valuable time and resources in even the most demanding enterprise environments.



Figure 1: HP BladeSystem solution



Each end-to-end component provides specific value to the integrated solution.

HP BladeSystem c-Class enclosure

The BladeSystem c-Class is a modular platform that can be scaled with integrated computing, storage, and networking. It is designed to meet the ever-expanding needs of IT organizations. Multiple BladeSystem enclosures can be deployed together, with SSCM used to manage all of the associated HP StorageWorks H-series switches, HP StorageWorks HBAs, and HP StorageWorks arrays.

HP StorageWorks Enterprise Virtual Array (EVA)

The HP StorageWorks EVA is a proven choice for virtualized storage. An EVA provides powerful, simple, modular enterprise-class storage for the enterprise customer. IT managers can choose any model of EVA—and any number of systems to deploy with this solution.

HP 8Gb FC Mezzanine Cards for HP BladeSystem c-Class

The HP 8Gb Fibre Channel Mezzanine Cards for the HP BladeSystem c-Class are optimized for virtualization, low power usage, management, security, reliability, availability, and serviceability. The HBAs enable data center consolidation through server virtualization by allowing multiple logical (virtual) connections to share the same physical port. Each logical connection has its own resources and can be managed independently. Each Fibre Channel mezzanine card supports 256 queue pairs, PCI requestor IDs (RIDs), function-level reset (FLR), and quality of service (QoS) for full data center consolidation and optimization.

HP Virtual Connect 8Gb Fibre Channel Module for HP BladeSystem c-Class

The HP Virtual Connect 8Gb Fibre Channel Module provides server blades with connectivity to the storage fabric, reducing cabling and simplifying network management of storage resources for c-Class server blades. It also adds the unique ability to wire servers and networks once so that servers can be added, replaced, or reassigned in minutes—without impact to the network.

HP Virtual Connect selectively aggregates multiple server Fibre Channel HBA ports on a Fibre Channel uplink using N_Port ID Virtualization (NPIV), which makes the HP Virtual Connect Fibre Channel module transparent to the Fibre Channel fabric, cleanly separating the server enclosure from the SAN.

HP StorageWorks Simple SAN Connection Manager

HP provides end-to-end SAN management with Simple SAN Connection Manager. Included at no cost with every H-series (SN6000 and 8/20q) switch to provide complete management of a storage network, it is also integrated with HP Virtual Connect Enterprise Manager (VCEM) via the FlexFabric API to uniquely present a complete view of server-to-storage connectivity in the fabric. Traditional SANs require administrators to use separate management tools for the individual SAN components. There may be different interfaces, conflicting naming conventions, and management tools that are incompatible with each other. Consequently, setups and minor changes may take hours or days, and it can be difficult to add servers and deploy new applications, making SANs prone to potentially expensive configuration errors. HP StorageWorks Simple SAN Connection Manager facilitates SAN installation by automating every aspect of setup and configuration. Automatic SAN discovery and the use of point-and-click installation wizards allow an entire SAN to be deployed in minutes, not days. This includes EVA and MSA storage setup and provisioning, along with switch and HBA setup and deployment. SSCM software ties together the entire end-to-end HP BladeSystem and storage infrastructure solution for managing the SAN.

HP StorageWorks H-series Fibre Channel switches

The HP StorageWorks SN6000 Stackable 8Gb Fibre Channel Switch and HP StorageWorks 8/20q Fibre Channel Switch are designed to make enterprise

SANs affordable and easy to use and scale, especially as the network expands. Built with low-cost, high performance, and flexibility in mind, the SN6000 switch is offered in models with 8 and 20 enabled device ports supporting 8, 4, and 2 Gbps speeds, plus 4 high-speed 10 and 20 Gbps stacking ports for linking SN6000 switches. Each 8/20q switch features 20 device ports supporting 8/4/2 Gbps speeds and offers 8- and 16-enabled-device-port models. The 8-enabled-device-port SN6000 model and the 8- and 16-enabled-device-port 8/20q models can be upgraded to 20 enabled device ports with 4-port upgrade licenses. After using 20 device ports on the SN6000 switch, additional switches can be stacked for up to 120 usable device ports per stack in single manageable unit. Additional device ports are supported in a 500+ device-port multi-stack configuration. Included SN6000 10 Gbps stacking ports may be upgraded to 20 Gbps speed at any time, without interruption, to extend the life of the solution as SAN performance requirements increase. Transparent Router functionality, standard on H-series (SN6000 and 8/20q) switches, provides heterogeneous, seamless interoperability and non-disruptive access to servers and storage on HP B-series and HP C-series SANs.

Dramatic reduction in solution installation and deployment time

A typical two-chassis HP BladeSystem c7000 and EVA storage infrastructure solution could take a considerable amount of time using traditional methods to configure and be ready for application deployment following the physical installation of hardware. A traditional SAN solution without H-series switches may require individual infrastructure management software, additional license installations, and multiple step configuration tasks as well. The end-to-end solution with HP BladeSystem c-Class, HP Virtual Connect, EVA storage, H-series switches, and HP StorageWorks SSCM dramatically cuts that time from hours to minutes.

For example, let's examine the time saved by deploying an HP end-to-end server and storage solution with HP StorageWorks Simple SAN Connection Manager.



Deployment with SSCM

Using Simple SAN Connection Manager, a system administrator will experience a dramatic reduction in the amount of time it takes to get this server and storage solution ready for application deployment. SSCM complements the high-level capabilities of HP StorageWorks Command View EVA software; integrates with HP VCEM via the FlexFabric API; and significantly reduces the time and number of steps required to install, configure, and manage the entire SAN infrastructure. Many of the tasks—zoning the server’s HBAs, creating the server identity, adding a worldwide port name (WWPN), and creating virtual disks (Vdisks)—are automated and require fewer user steps.

Host creation

Host creation is the process of configuring server identification and attributes for each server that will have access to the EVA storage system. When SSCM is used to provision storage from the EVA storage system, host creation on the EVA is not necessary or required. Upon startup, SSCM discovers the entire infrastructure including Fibre Channel mezzanine cards, Virtual Connect paths, Fibre Channel switches, and EVA storage systems. SSCM automatically catalogs each piece of equipment and makes it available for LUN creation activities. No time is required for host creation.

LUN creation

LUN creation is the process of creating a virtual disk on the EVA storage system that will be presented to and accessed by a server. SSCM performs LUN creation using the fast and easy “Create Logical Disk Wizard.” The process for creating a LUN with SSCM is as follows:

1. Select the Create Logical Disk Wizard.
2. Select RAID Type.
3. Select Size of LUN.
4. Name the LUN.
5. Select which server has access to the LUN from a list of servers.
6. Select either Add, to define another LUN, or Next. Repeat steps 1–6 until all LUNs are defined.
7. Select Next. All defined LUNs will be created.

Using the “Create Logical Disk Wizard,” users can define the attributes for a single LUN in about 45–60 seconds. For example, it takes roughly 3–5 minutes for SSCM to execute the creation of LUNs on an EVA. To define and create 64 LUNs on an EVA with SSCM takes only about 45 to 60 minutes, depending on the size of the LUNs.

Table 1: Comparison: creating 64 LUNs with and without SSCM

	Host creation (32 virtual hosts)	LUN creation (64 LUNs)	LUN mounting (64 LUNs)	Total effort (keyboard time)
Using typical storage management applications	3 to 4 hours	3.5 to 4 hours	2.5 to 3 hours	Up to 11 hours
Using SSCM	0 hours	~60 minutes	0 hours (Windows®)	~1 hour

LUN mounting

LUN mounting is the process of establishing communication between a server and the Vdisk residing on the EVA storage system. SSCM comes standard with a LUN Partitioning Wizard that makes LUN mounting activities for Microsoft® Windows environments automatic. SSCM will recognize that the user has created a LUN or LUNs for Microsoft Windows servers and automatically ask the user if they want “Automatic Partitioning.” If the user accepts automatic partitioning, SSCM will interface with each Microsoft Windows server that had a LUN defined for it and will perform all disk management functions, such as partitioning the drive, assigning the next available drive letter, and formatting the drive. This is all done automatically with virtually zero execution time.

Non-Windows server environments require the user to log on to each server blade and use its operating system tools to perform LUN mounting activities. In this case, the time for LUN mounting would be roughly 4 to 6 minutes per LUN.

With SSCM, the deployment time of a complete end-to-end HP BladeSystem and EVA storage infrastructure solution is optimized, with significant savings in administration hours, as illustrated in Table 1.

The table illustrates the time savings that SSCM enables to get to the LUN creation and mount stage. And in a Windows environment, still greater time savings that can be achieved with SSCM: Because SSCM is integrated with Microsoft Virtual Disk Services, all the LUNs can be formatted in a single process. With standard applications, the administrator must log on to each server and format the LUN. But with SSCM, formatting can be done with a single command, and performed in parallel on all the Windows servers—saving hours or even days, depending on the number of LUNs and servers in the SAN.

Dramatic reduction in ongoing SAN management tasks

SSCM not only reduces solution deployment time from days to minutes, but also dramatically reduces ongoing management tasks, such as provisioning additional storage and adding new server blades, storage systems, or SAN switches, as well as ongoing maintenance and monitoring. With HP Virtual Connect to connect server blades and HP Virtual Connect Enterprise Manager (VCEM) with the VC FlexFabric API, SSCM presents an end-to-end view of server-to-storage connectivity in the fabric, further enhancing these management benefits.

Table 2: Comparison: creating an additional 10 LUNs with and without SSCM

	Host creation	LUN creation (10 LUNs)	LUN mounting (10 LUNs)	Total effort (keyboard time)
Using typical storage management applications	N/A	0.5 to 1 hour	0.5 to 1 hour	1 to 2 hours
Using SSCM	N/A	Approximately 10 minutes	0 hours	Less than 30 minutes

Storage provisioning

80–90% of the time spent managing a SAN after initial deployment is for additional storage provisioning, or LUN creation. Creating an additional 10 LUNs with SSCM would take roughly 10 minutes if all the LUNs were to be accessed by Microsoft Windows servers (see Table 2). Further time savings is achieved with SSCM in Windows environments, because formatting the LUNs can be done in a single step as noted earlier. For 10 LUNs and 10 servers, this can be as much as 2 to 3 hours of additional time savings.

Adding new server blades

SSCM will automatically scan and recognize additional server blades added to an existing HP BladeSystem chassis and recognize server blades in a newly connected chassis. These servers will be immediately available for LUN masking, mapping, and mounting.

Adding new storage arrays

Discovery of a new storage array is automatic and will initiate the SSCM storage deployment wizard. SAN administrators deploying a new EVA for a Microsoft Exchange environment can use the storage

deployment wizard to automatically set up the EVA based on HP and Microsoft Exchange best practices. Simply select the number of users, maximum mailbox size, and server, and SSCM will automatically create the drive pools, data disks, and log disks for the specified Microsoft Exchange environment. Whether the EVA is for Microsoft Exchange or any application storage needs, SSCM will automatically set up and configure the EVA system. Once it is complete, users can run the LUN creation wizard at any time to provision additional LUNs from any EVA in the SAN.

Adding new HP SN6000 Stackable 8Gb Fibre Channel Switches

Adding HP StorageWorks SN6000 Stackable 8Gb Fibre Channel Switches to the SAN is extremely fast, simple, and error free. Nondisruptively connect the high-speed stacking ports from the existing SN6000 switch to the newly deployed SN6000 switch. Upon startup or refresh, SSCM will automatically discover the new switch and launch the switch deployment wizard. Setup and configuration of the SN6000 switch through SSCM is a simple 3-step process: Set IP network settings, change password for security purposes, and establish HP best-practice HBA zoning. This whole process takes roughly 4 minutes from cable insertion to final setup.

Conclusion

Deployment of an enterprise server, SAN infrastructure, and storage solution is often complex and time-consuming, requiring many long hours of administration time and the use of multiple point management tools. Deploying servers, storage, and SAN infrastructure as one cohesive solution from HP has never been easier. Available from HP is a full enterprise tested turnkey solution that uses HP StorageWorks Simple SAN Connection Manager to deploy HP BladeSystem c7000 or c3000 Enclosures with EVA storage arrays, HP QMH2562 or LPe1205-HP 8Gb FC HBAs, HP Virtual Connect 8Gb Fibre Channel Modules for HP BladeSystem c-Class, and StorageWorks H-series switches.

Key advantages of this complete HP end-to-end enterprise solution include:

- Lower infrastructure costs and unique benefits with HP Virtual Connect and HP StorageWorks H-series Fibre Channel switches
- One interface to deploy, configure, zone, provision, and manage the majority of typical tasks performed by administrators

- Lower administration costs through intelligent and simplified management
- Less training, and fewer management tools to think about
- Greater operational efficiencies with SAN management software:
 - Simple SAN Connection Manager (SSCM) speeds enterprise deployment, upgrades, and implementation of best practices.
 - Support efforts are reduced.
 - SSCM is exclusive to HP.
 - Manage HBAs and switches, and provision storage, from a single screen—for integrated end-to-end management from server to storage.
 - Experience enterprise-class functionality controlled by an intuitive interface.

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