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Compaq Smart Array SAN Access Module: the Industry's First DAS-to-SAN Bridge

Abstract: The dominant challenge for today's IT professionals at the ground level is backup operations. Now, data centers having or deploying up to 11 servers with DAS can easily implement a SAN dedicated to the backup of all the storage on all of the servers. Smart Array SAN Access technology will be the basis for making better backup operations possible. Smart Array SAN Access and Compaq's Enterprise Backup Solution (EBS) can simplify the backup process and consolidate the management of backup operations while taking advantage of the reliability and data integrity offered by a Fibre Channel SAN. Bridging, or joining, DAS to the SAN offers the flexibility of superior DAS solutions while providing a simple step into SAN deployment.

Realizing another industry first, in June 2001, Compaq released the SAN Access Module for the Smart Array 5302 Controller, the industry's first true integrated bridge from existing SCSI Direct Attach Storage (DAS) to the Fibre Channel Storage Area Network (SAN). This new technology will assist customers deploying multiple servers in a data center environment, providing the following benefits:

- Investment protection
- Simplification of backup operations
- Reduced backup systems costs
- Access to incremental primary storage on the SAN
- SAN benefits
- Infrastructure development

This white paper elaborates on the features and benefits of the Compaq Smart Array SAN Access Module, and lists the pieces needed to implement the new solution.

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Compaq Smart Array SAN Access Module: the Industry's First DAS-to-SAN Bridge
White Paper prepared by Industry Standard Server Group

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Product Overview

The Technology

The Smart Array SAN Access Module for the Smart Array 5302 Controller is a key component of Compaq's delivery of an integrated storage environment. The Smart Array SAN Access Module is the industry's first true integrated bridge from existing SCSI Direct Attach Storage (DAS) to the Fibre Channel Storage Area Network (SAN). The module is a daughter card which plugs into the Smart Array 5302 Controller, thereby allowing the SCSI controller to connect directly to a Fibre Channel SAN. DAS, driven by the high performance Smart Array 5302 Controller with Wide Ultra3 SCSI using a single PCI slot, can be bridged directly into a Storage Area Network with 1 Gbit Fibre Channel bandwidth.

The Smart Array SAN Access Module fits into the same slot as the Ultra3 SCSI dual channel upgrade daughter card. It allows the host to access Enterprise Backup Solutions (EBS) through a FC-AL Hub or Loop Switch for consolidated backup. It also allows the host to access a RAID Array 4100 volume through a FC-AL Loop Switch for scalable primary storage by way of a SAN. The module is compatible with Microsoft Windows NT and 2000 as well as Novell NetWare.

Designed, tested, and qualified with the Smart Array 5302 Controller and ProLiant servers, the Smart Array SAN Access Module bridges today's DAS into the benefits offered by the SAN.

The Advantages

The Smart Array SAN Access Module offers the following key benefits:

- Investment protection – Continue to use and deploy DAS driven by Smart Array 5302 controllers, the highest performance PCI RAID controller in the industry.
- Simplification of backup operations – Consolidate backup operations with an EBS for up to 11 individual servers for simplicity of deployment and management of data protection.
- Reduced backup systems costs – Implement an EBS for several servers instead of investing in secondary DAS for each server.
- Access to incremental primary storage – Maximize storage capacity with the RAID Array 4100, when separately configured using Selective Storage Presentation (SSP), to access incremental primary storage capacity on an existing SAN.
- SAN benefits – Implement a basic SAN for consolidating backup operations and test the business value of the SAN while continuing to use existing DAS.
- Infrastructure development – Begin realizing the benefits of the SAN today while putting together a cost effective, highly reliable, and simply managed storage infrastructure for tomorrow.

Without Smart Array SAN Access Module bridging technology, a customer would need a separate Fibre Channel Host Bus Adapter (HBA) to deploy an EBS or connect to a RA4100. The SAN Access Module is not intended to replace a standard Fibre Channel HBA for large-scale SAN deployments. Rather, the module is suggested for use in backup environments with up to eleven servers or in server deployments currently utilizing DAS wanting to connect to a RA4100. An HBA solution may be preferable in larger SAN deployments.

The benefits realized from deploying the Smart Array SAN Access Module as opposed to the HBA solution are as follows:

- Slot Utilization – an additional PCI slot is not taken up
- Cost – an integrated solution reduces total solution costs
- Improved performance – Smart Array controller unloads I/O management from the server and increases utilization of available bandwidth
- Continue to use the SA-5302 for SCSI Ultra3 DAS
- Less space is taken up – use a single tape device to backup multiple servers
- Less power is consumed
- Fewer thermal concerns

The Leadership

Compaq has no competitors for the bridge from DAS to SAN, once again pioneering a product to meet customer needs. Compaq has 51% market share of the world's internal enterprise storage with DAS, with the remainder split between integrators and OEMs. For SAN applications, Compaq offers a premium mix of products, solutions, support, and vision.

Ideal Customers

The Smart Array SAN Access Module offers an extraordinary opportunity for current ProLiant DAS users to buy their first SAN. The Smart Array SAN Access Module has a unique value for customers having or deploying up to 11 servers in a data center environment, with SCSI DAS storage, and who need to purchase secondary storage solutions. The module is less useful for customers having less than three server deployments, not having SCSI DAS storage, and who are already deploying high availability SANs.

Customers can choose a package for Advanced Intelligent Tape (AIT) or Digital Linear Tape (DLT). Customers who are currently invested in DAT/8 mm types of backup solutions will most likely choose AIT due to price sensitivity and knowing that DAT is nearly end-of-life. Customers already familiar with DLT backup solutions will remain with DLT.

Configuration Details

Figure 1 shows the basic EBS configuration of six ProLiant servers using SAN Access Modules and internal or external direct attached storage.

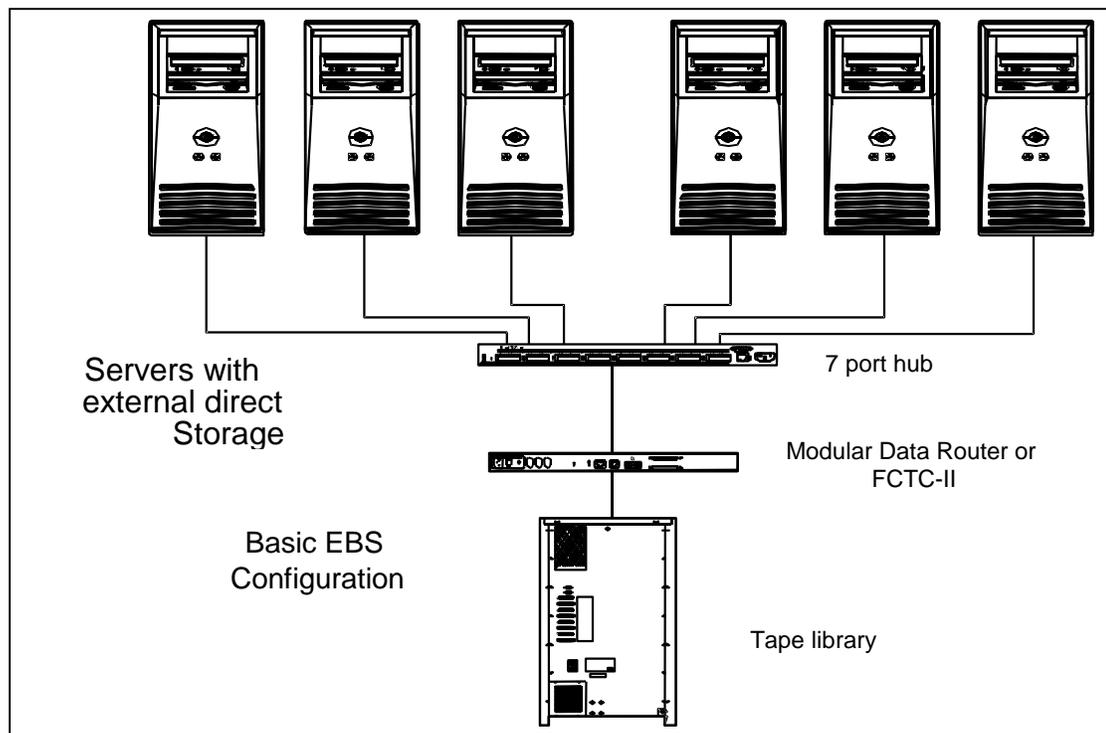


Figure 1. Basic EBS configuration

Figure 2 shows the Basic SAN configuration with SAN Access Modules and RA4100 units.

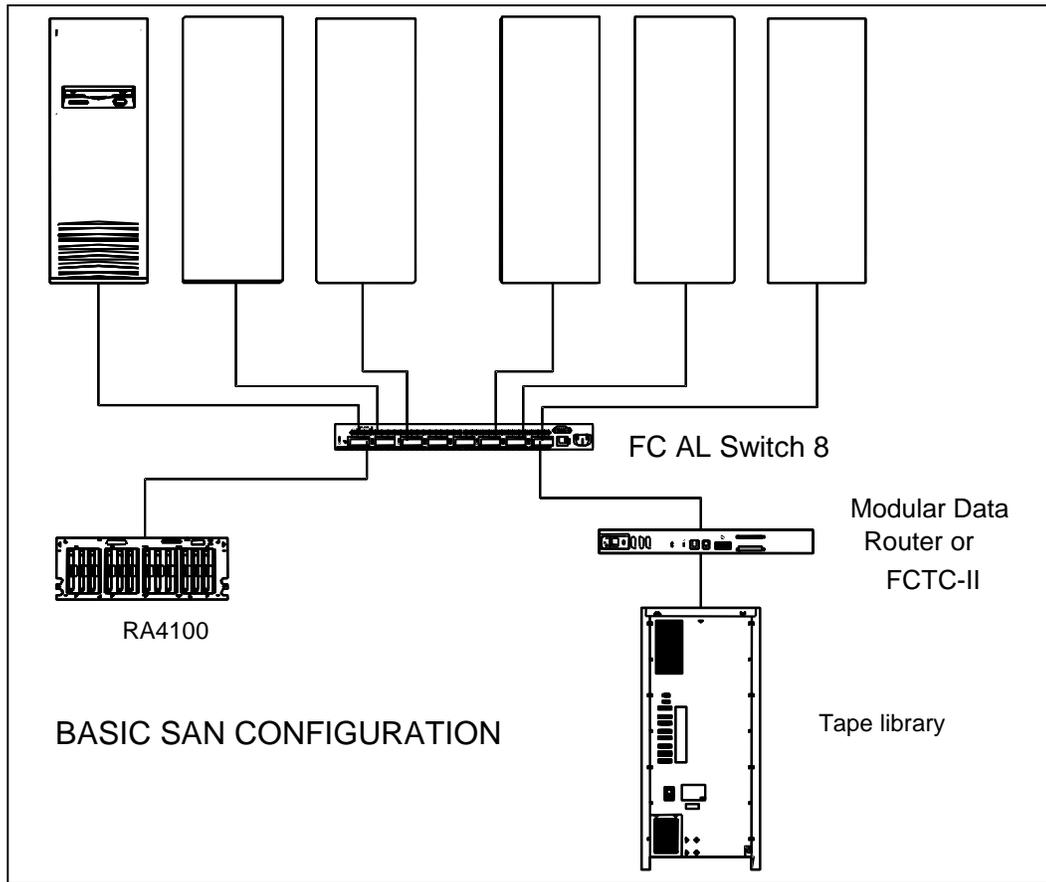


Figure 2. Basic SAN configuration with Raid Array 4100 units

Product Configuration Rules

The Smart Array SAN Access Module configuration rules are as follows:

- Qualified on all *ProLiant* servers on which the Smart Array 5300 (series) Controller is qualified
- Qualified for FC-AL hubs with EBS (ARCPaq and BackPaq) only
- Qualified for FC-AL loop switches with EBS (ARCPaq and BackPaq) and RAID Array 4100
- RAID Array 4100 access limited to volume (LUN) created and assigned to the SAN Access Module by a separate Fibre Channel Host Bus Adapter (in a separate server)

Solution Package

The pieces needed to implement the DAS-to-SAN bridge by way of the Smart Array SAN Access Module are provided in the following sections, “Distributed Storage with EBS for AIT,” and “Distributed Storage with EBS for DLT.” The SAN Access Module will support both Windows NT/2000 and Novell NetWare when using the BackPaq, BackUp Exec Version 8.5 or later, EBS software, and will support Windows NT/2000 and Novell NetWare when using the ARCPaq, ARCserve Kit Version 3.0 or later, EBS software. Existing Smart Array 5302 Controller installations must be upgraded to the latest firmware as of the date of the module announcement.

Distributed Storage with EBS for AIT

- SAN Access Module for Smart Array 5302 Controller per server
- Smart Array 5302 controller per server
- EBS basic bundle (7-port Hub, Modular Data Router, and per server AS/BE EBS SAN licenses)
- Single-drive AIT Tape Library

Distributed Storage with EBS for DLT

- SAN Access Module for Smart Array 5302 Controller per server
- Smart Array 5302 controller per server
- EBS basic bundle (7-port Hub, Modular Data Router, and per server AS/BE EBS SAN licenses)
- Single-drive DLT Tape Library

RA-4100 Option

- SAN Access Module for Smart Array 5302 Controller per server
- Smart Array 5302 controller per server
- Compaq 64-bit/66-MHz Fibre Channel Host Adapter*
- Compaq FC-AL Switch 8
- RAID Array 4100

**At least one server on the SAN must have a Compaq 64-bit/66-MHz Fibre Channel Host Adapter to configure the RAID Array 4100 using Selective Storage Presentation (SSP) and assign a volume (LUN) to the SAN Access Module(s).*

Summary

Once again, Compaq is the first to offer an important technology innovation. In the Smart Array SAN Access Module, modularized, simplified technology is available to meet customer needs, showing Compaq's continuing leading-edge vision and capability.