

MODELS

High Availability Storage
Solution for x86 Servers
201766-001
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OVERVIEW

The Compaq *StorageWorks* High Availability Storage Solution for x86 Servers

The High Availability Storage Solution for x86 Servers is a pre-tested configuration of hardware, software, installation, and customer training that is targeted at moving large Microsoft Exchange servers into a SAN-compatible environment.

It provides a first step toward simplifying rapidly growing storage deployment by combining appropriate Compaq products with services and customer training to meet the requirements of a typical medium-sized storage configuration attached to ProLiant and other x86-based servers. All the components of the High Availability Storage Solution for x86 Servers can become part of a future Compaq Storage Area Network (SAN) installation with the addition of appropriate Fibre Channel switches.

Microsoft Exchange Solution

In today's information age, collaboration via electronic communication is an essential part of every business. Microsoft Exchange Server contains collaboration tools that help develop a wide range of collaborative solutions.

The High Availability Storage Solution for x86 Servers easily satisfies the storage capacity and performance needs of a dual server Microsoft Exchange configuration. Migration from existing server based Exchange Server configurations to the High Availability Storage Solution for x86 Servers is straightforward. Compaq provides a fully documented migration process. The High Availability Storage Solution for x86 Servers supports smooth migration to a full SAN configuration.

Hardware and Software Components

The High Availability Storage Solution for x86 Servers consists of the following components:

- Two independent Fibre Channel loops, each capable of transferring data at 100 megabytes per second.
- Four Fibre Channel Host Adapters and two seven-port Fibre Channel Storage Hubs to link the servers to the Fibre Channel loops. The two loops insure that if one loop fails, all the data in the storage system is still available.
- Two dual controller RAID Array 4100 systems. Each system holds up to twelve 18.2 gigabyte disks or eight 36.4 gigabyte disks.
- One 22U Rack 9000 with 13U available to mount existing x86 Servers Microsoft Exchange servers. (1U is 1.75 inches of vertical height in the rack.)
- Software for configuration and data management in the RAID environment.

These components are integrated to provide the Compaq *StorageWorks* High Availability Storage Solution for x86 Servers Solution. Compaq decided to integrate these specific "best-in-class" components because each one offers the very best technology to solve the problems of migrating an existing Microsoft Exchange Server system to a SAN-ready storage environment.

Installation

The High Availability Storage Solution for x86 Servers is a pre-tested configuration of hardware, software, installation, and customer training that is targeted at moving large Microsoft Exchange servers into a SAN-compatible environment. Installation is available from Compaq Customer Services, and includes:

- Assembly of hardware components.
- Installation of Fibre Channel host adapters into customer's Exchange servers.
- Configuration of RAID Array 4100 and Fibre Channel hubs into a High Availability Storage subsystem.
- Installation of management software.
- Migration of customer's Exchange data from existing disks to the RA4100 disks.
- System Verification Test.

OVERVIEW *(continued)*

Fibre Channel Arbitrated Loop

The Compaq High Availability Storage Solution for x86 Servers Solution uses Fibre Channel Arbitrated Loop technology to transfer data between the servers and the external storage subsystems. Fibre Channel Arbitrated Loop delivers the advantages of 100 MB/s bandwidth, up to 126 addressable connections, easy cabling, 500 meters to 10 kilometer distances between nodes, hot pluggable and node-bypass capabilities.

The High Availability Storage Solution for x86 Servers configuration uses two independent Fibre Channel Arbitrated Loops to provide full no-single-point-of-failure redundancy. Each loop implements an independent Fibre Channel Fabric. Any failure on one Fabric causes the system to use the other Fabric for communication between the servers and the external storage. For the purposes of this Solution, one loop is called "Fabric A", and the other is called "Fabric B".

StorageWorks RAID Array 4100

The Compaq High Availability Storage Solution for x86 Servers Solution uses two dual-redundant RA4100 RAID subsystems. These include a total of four RAID controllers in two separate rack mounted enclosures. Each RA4100 subsystem operates completely independently, and the redundant controller in each subsystem protects against controller failures.

RAID levels 0 (striping), 1 (mirroring), 4 (block parity) and 5 (distributed block parity) are supported by the RA4100. For maximum data availability in case of disk failure, and to maximize I/O request performance, RAID 1 (mirroring) is the preferred option for the High Availability Storage Solution for x86 Servers. In mirrored data subsystems, two complete copies of all of the user's data are maintained, and READ requests from the server can be handled from either copy--which maximizes READ performance.

Each RA4100 has 64 megabytes of cache memory. This is used to optimize the performance of Microsoft Exchange Server application.

Fibre Channel Storage Hub 7

The Fibre Channel Storage Hub 7 is a seven-port Fibre Channel Hub. The two Hub 7s in this solution, provide the Fibre Channel interconnection fabric for the High Availability Storage Solution for x86 Servers Solution. Each hub provides two ports for host connections and two ports for storage connections, with additional ports for later expansion. The Hub 7s are mounted in the Rack 9000 in a 1U form factor.

Fibre Channel Host Adapter Kit / PCI

The Fibre Channel Host Adapter Kit / PCI provides the capability to attach Compaq ProLiant and other x86 servers to the Fibre Channel interconnection fabric. Each Fibre Channel Tape Host Adapter has a single Fibre Channel port that provides a fiber optic connection to the Storage Hub 7. Each Host Adapter Kit uses one PCI slot in a server. To achieve data path redundancy, each server has two Host Adapter Kits. Each server has one connection to Fabric A and separate connection to Fabric B.

Rack 9000 22U

Compaq sets the standard for performance and value in the enterprise with the Compaq Rack 9000 Series family of rack cabinets and rack options. This enterprise-class rack cabinet system combines next-generation structural integrity and ease of use capabilities to deliver industry-leading performance.

Ideal for onsite assembly of rack mounted Compaq ProLiant servers and *StorageWorks* products, the Compaq Rack 9000 Series of rack cabinets complement and protect customer investment in technology. Specifically designed to ensure outstanding performance and seamless integration throughout the entire enterprise, the Compaq Rack 9000 could easily be the last family of racks that the customers ever have to think about purchasing. Key features include:

- Unique frame and rail design
- Thermal integrity
- Security provisions
- Flexibility
- Custom expandability
- Warranty

Hardware Support, Configuration, and Diagnostic Software

The High Availability Storage Solution for x86 Servers uses standard, fully supported Compaq hardware and software products. All supporting material, including support, configuration, and diagnostic functions are exactly the same as those used in the individual products. All support, configuration, and diagnostic software are included in the solution.

OVERVIEW *(continued)*

Scalability

The solution capacity can be increased to as much as 436 GB using 18 GB disk drives (total capacity is 24 disks). In addition, both performance and capacity can be scaled with the addition of RA4100 units, and each RA4100 holds 12 disks of up to 36 GB each.

The High Availability Storage Solution for x86 Servers is compatible with Compaq *StorageWorks* Storage Area Network (SAN) products. As installation evolves toward larger SAN deployment, all the hardware and software in the High Availability Storage Solution for x86 Servers can remain part of the installation. This means that the solution can be scaled in the context of a larger SAN.

Smooth Integration/Installation

The Compaq High Availability Storage Solution for x86 Servers integrates smoothly into an existing Microsoft Exchange environment. All the components are customer installable. Installation is also available from Compaq.

Prerequisites

The Compaq High Availability Storage Solution for x86 Servers is designed to work with an existing customer environment that includes the following components.

- Two x86-based servers (See the Compatibility Matrix for supported servers located in the Sizing and Configuration Guide) Configured in a MSCS cluster
 - One x86-based server running Exchange Server with failover selected for second ProLiant server
- The second (failover) server can be used for other applications.

Warranty

A three-year parts warranty, one-year on-site warranty and a one-year labor warranty cover the Compaq High Availability Storage Solution for x86 Servers.

Note: Certain restrictions and exclusions apply. Consult the Compaq Customer Support Center for details. In Canada, consult the Product Information Center at 1-800-567-1616 for details.

SPECIFICATIONS

High Availability Storage Solution for x86 Servers

The High Availability Storage Solution for x86 Servers is a pre-tested installation that includes the following Compaq products. (Refer to the QuickSpecs or Detailed Descriptions for the individual product specifications)

Hardware Configuration

Rack 9000 22U	120665-B21
18.2-GB Pluggable Wide-Ultra SCSI-3 10K-II Drives (1.0")	128417-B21
Fibre Channel Host Adapter Kits / PCI	120186-B21
Fibre Channel Storage Hub 7s	234453-001
<i>StorageWorks</i> RAID Array 4100s (Rack)	146013-001
<i>StorageWorks</i> RAID Array 4100 Redundant Controllers	223187-B21
Fibre Channel Storage Hub 7 Tower-to-Rack Conversion Kit	136127-B21

Software Configuration

Compaq Redundancy Manager	Included
Compaq Insight Manager	Included
Compaq Array Configuration Utility	Included
Compaq User Diagnostic Utility	Included
Compaq Array Diagnostics Utility	Included
Compaq Fault Isolation Utility	Included

Optional Software

Redundant Host Adapter Failover Software Kit	174681-B21
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ORDERING INFORMATION

Product Name	Part or Order Number	Type: Pre-Requirement, Optional or Required
High Availability Storage Solution for x86 Servers	2T-21121-01 201766-001	Required