



Netscape SuiteSpot TruCluster Available Server UNIX AlphaServer 4x00

DIGITAL HiTest Notes

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Preface

This document provides an overview of DIGITAL HiTest Suites and detailed technical information about interoperability test results for the Netscape SuiteSpot TruCluster Available Server UNIX AlphaServer 4x00 HiTest Suite.

Audience

Primary users of this document are DIGITAL and Partners sales representatives and technical support personnel. Secondary audiences include product managers, customers, and the personnel responsible for installing, setting up, and operating a DIGITAL HiTest Suite.

Road Map

This document contains the following chapters:

- 1. Introduction** – Provides a brief summary of the benefits of DIGITAL HiTest Suites and an overview of the Suite covered in this document.
 - 2. Configuration Data** – Includes tables of configuration data about the hardware and software components that define the Template, and special configuration rules if any.
 - 3. System Installation and Setup** – Presents useful information for installing and setting up this DIGITAL HiTest Suite.
 - 4. Interoperability Tests and Results** – Describes how the tests were set up (including database organization), what data and programs were placed on what disks, and how the tests were run.
 - 5. System Limits and Characterization Data** – Summarizes any system limitations or characterization data that were identified during testing.
 - 6. Problems and Resolutions** – Discusses any problems and resolutions that were discovered during testing.
- Appendix A: Detailed Hardware Configuration** – Contains more detailed information about the hardware and software components listed in the Configuration Data chapter.

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DIGITAL HiTest Suite and Its Advantages

DIGITAL HiTest Suites are guidelines for configuring a set of prequalified computer systems. A HiTest Suite often contains all the hardware and software needed for a complete customer solution. DIGITAL HiTest Suites can be used as a basis for configuring systems that satisfy a wide set of customer requirements. Typically, Suites target specific markets such as Data Warehousing or Internet Service Providers (ISPs).

DIGITAL Product Management and Engineering select the components and design the configurations in each HiTest Suite to ensure high system reliability, application performance, and upgradability. A Suite's hardware and software components have been successfully tested for interoperability.

A HiTest Suite specifies allowed ranges of hardware and software components, as well as each component's part number, description, and revision information. These specifications are listed in the *DIGITAL HiTest Template*.

The components in a HiTest Suite are organized into two groups, the *DIGITAL HiTest Foundation* and the *DIGITAL HiTest AppSet*. The HiTest Foundation includes the hardware, operating system, middleware, and database software. The HiTest Foundation can be used as a base on which any customer-desired applications can be installed. The HiTest AppSet includes the software specific to one class of customer solutions.

Configuring a DIGITAL HiTest Suite is straightforward. Select components from the HiTest Template to configure a DIGITAL HiTest System. Any system configured as specified in the DIGITAL HiTest Template can be called a DIGITAL HiTest System.

The HiTest Suite is documented in the *DIGITAL HiTest Notes*. The HiTest Notes list the HiTest Foundation and HiTest AppSet components. HiTest Notes also describe the testing of the Suite and include configuration details, installation instructions, tuning parameters, problems encountered and their solutions, and system diagrams.

Some components listed in the HiTest Foundation or AppSet may be optional. If the minimum quantity is zero (0), then the component is optional. If the minimum quantity is one or more, then you must order at least the minimum quantity.

The maximum quantities represent the largest group of components that were tested for interoperability with all the other components in the Suite. Although it may be possible to place more than the specified maximum quantity of a component on a DIGITAL system, extensive interoperability testing was not done at that level and such a system would not be considered a DIGITAL HiTest System.

Introduction

You can select any combination of components with quantities ranging from the minimum to the maximum specified. Occasionally, special configuration rules give further guidance or restrict configurations. These rules appear in the Configuration Data chapter of the HiTest Notes.

A customer can include the Suite-specified hardware and software they need and then layer on additional software. Other types of hardware, called *add-on hardware*, can also be added to a DIGITAL HiTest System. The add-on hardware is specified in the Configuration Data chapter of the HiTest Notes, and in the HiTest Systems Web Pages, available through the following URLs:

<http://cosmo.tay.dec.com> (Intranet)
<http://www.partner.digital.com:9003/cgi-bin/comet> (Internet)

Even though the customer may install application software that is not specified in the Suite, the customer and DIGITAL still experience the advantages of knowing that all of the Suite-based hardware and software interoperates correctly. Of course, the full benefit of configuring a system from a HiTest Suite is obtained when the system includes only specified HiTest Foundation and AppSet components.

Overview of This DIGITAL HiTest Suite

The Netscape SuiteSpot TruCluster Available Server UNIX HiTest Suite consists of the following software components:

- Netscape SuiteSpot, which includes:
 - Catalog Server
 - Certificate Server
 - Directory Server
 - Enterprise Server
 - LiveWire Pro
 - Mail Server
 - Media Server
 - News Server
 - Proxy Server
- DIGITAL UNIX
- TruCluster Available Server

This Suite will meet the needs of Internet Service Providers (ISPs) and Intranet users with a need for highly available servers.

Netscape SuiteSpot provides a set of modular, standards-based collaboration services built around a single architecture. These servers enable networks with enterprise servers to communicate and collaborate, allowing for lower cost of deployment and ownership.

AlphaServer 4000/4100 systems feature 466 MHz of processing power and 4 MB onboard cache. The AlphaServer 4000/4100 offers very large memory (VLM) performance to midrange users, is fully scalable and upgradeable and offers mix-and-match flexibility.

With Netscape SuiteSpot and AlphaServer 4x00 systems, users will see outstanding database and application performance, scalability, and availability.

Configuration Data

This chapter describes the tested DIGITAL HiTest Configuration Suite including the hardware, software, and firmware components, and their revision levels. Special configuration rules are explained if required.

Hardware and Software Components

Table 2-1 identifies the range of hardware and software components that can be configured using the Netscape SuiteSpot TruCluster Available Server HiTest Suite. The ranges of hardware include 512 MB through 2 GB of memory, 6 through 82 4.3 GB disks, and multiple Fast Ethernet and RAID controllers.

Table 2-2 lists the System Management Station hardware and software.

Table 2-3 lists the revision levels of the components.

The HiTest Template (Table 2-1) consists of three categories:

- **AppSet Software** – Includes software specific to one class of customer solutions, in this case Independent Software Providers (ISPs).
- **Foundation Hardware** – Includes the base system, storage, and other hardware options.
- **Foundation Software** – Includes the operating system, middleware, and database software.

When ordering an item from a HiTest Template, select a quantity that is within the minimum/maximum range for the item. If the minimum quantity is zero (0), then the component is optional. If the minimum quantity is one or more, then order at least the minimum quantity, but not more than the maximum quantity. The maximum quantity represents the greatest number of components that were tested for interoperability with all the other components in the Suite.

For more details on the HiTest Suite hardware configuration, see Appendix A.

Table 2-1: Netscape SuiteSpot TruCluster Available Server DIGITAL HiTest Template

Netscape SuiteSpot TruCluster Available Server <i>HiTest</i> AppSet DIGITAL UNIX AlphaServer 4x00 <i>HiTest</i> Foundation				
<i>For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.digital.com:9003/cgi-bin/comet For a hardcopy of this Suite's HiTest Notes, order EK-HNSTA-HN.</i>				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
AppSet Software				
1	Netscape SuiteSpot V2.01	QB-50EAA-WA	1	1
Foundation Hardware				
2	<p><i>Select two identical base systems:</i></p> <p>AlphaServer 4100 5/466 Drawer UNIX 512 MB AlphaServer 4100 5/466 Drawer UNIX 1 GB AlphaServer 4100 5/466 Drawer UNIX 2 GB AlphaServer 4000 5/466 Drawer UNIX 512 MB AlphaServer 4000 5/466 Drawer UNIX 1 GB AlphaServer 4000 5/466 Drawer UNIX 2 GB</p> <p><i>Hardware includes:</i></p> <ul style="list-style-type: none"> • 5/466 MHz CPU with 4 MB cache • Memory as indicated above • S3 Trio64 PCI 1 MB Graphics Adapter • DE500-AA 10/100 Mbit Fast Ethernet • KZPDA-AA FWSE SCSI and cable • RRD46-AB SCSI 12X CD-ROM drive • RX23L-AB 1.44 MB Floppy drive • LK47W-A2 PS/2 style keyboard • Three-button PS/2 compatible mouse <p><i>Software includes:</i></p> <ul style="list-style-type: none"> • DIGITAL UNIX Operating System base license • Unlimited User and Server Extension licenses • ServerWORKS • Internet AlphaServer Administration Software • DECEvent and BMC PATROL Agent • OnliNET Power Management 	<p>DA-51JAB-EB DA-51JAB-FB DA-51JAB-GB DA-53JEB-EA DA-53JEB-FA DA-53JEB-GA</p>	2	2
3	<p>Cabinet Enclosure</p> <p><i>Hardware includes:</i></p> <ul style="list-style-type: none"> • 4.3 GB Wide Disk (DS-RZ1CB-VW) • 19-in cabinet with StorageWorks Shelf and mounting kit. Cabinet supports up to seven more StorageWorks shelves. 	H9A10-ED	1	1
4	System Drawer Mounting Kit	CK-BA30A-BA	2	2
5	466 MHz CPU DIGITAL UNIX SMP UPG	KN304-DB	0	2
6	<p>450 Watt Power Supply</p> <p>Note: Provides redundancy (N+1) for up to two CPUs.</p>	H7291-AA	0	2

Netscape SuiteSpot TruCluster Available Server <i>HiTest</i> AppSet				
DIGITAL UNIX AlphaServer 4x00 <i>HiTest</i> Foundation				
For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.digital.com:9003/cgi-bin/comet For a hardcopy of this Suite's <i>HiTest</i> Notes, order EK-HNSTA-HN.				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
7	128 MB Memory Option 512 MB Memory Option 1 GB Memory Option Note: This HiTest Template supports a memory range from 512 MB to 2 GB. When selecting memory options, stay within the Template's 2 GB maximum. The 4100 supports three additional memory options and the 4000 supports one additional memory option.	MS320-CA MS330-EA MS330-FA	0	See Note
Note: Items 8 through 21 are StorageWorks components. The maximum quantities of these components are interdependent and will vary according to the StorageWorks configuration. See the section StorageWorks Issues later in this chapter.				
8	<i>Order when more than 5 additional StorageWorks shelves are ordered.</i> StorageWorks Cabinet	SW500-AC	0	1
9	Cabinet StorageWorks Shelf Note: Each shelf can hold up to seven Storage Building Blocks (SBBs).	BA36R-RA	2	14
10	4.3 GB 7200 RPM UltraSCSI Disk Drive Note: Each disk represents one SBB. The maximum HiTest configuration was tested using RZ29B-VW disks.	DS-RZ1CB-VW	5	81
Note: When ordering tape drives (items 11 and 12), only one drive is needed per system. Similarly, each cluster needs only one autoloader.				
11	4/8 GB 4mm SCSI DAT Tape Drive Note: Each drive represents one SBB.	TLZ09-VA	0	2
12	32/64 GB 4mm DAT 5.25-inch Tape Loader Note: Each autoloader represents a triple SBB, requiring three slots.	TLZ9L-VA	0	1
13	PCI one-port FWD SCSI controller	KZPSA-BB	2	8
14	<i>Order one for each KZPSA-BB ordered.</i> 2 meter 16-bit SCSI cable (internal)	BN21K-02	2	8
15	StorageWorks shelf signal converter Note: Each signal converter represents one SBB. The maximum quantity is reduced by one for each HSZ52 present.	DWZZB-VW	0	4
16	Dual StorageWorks Array Controllers, each with 128 MB cache <i>HSZ52-AJ hardware includes:</i> <ul style="list-style-type: none"> • Two HSZ50 Controllers • 256 KB cache (128 KB per controller) • Two Tri-link Connectors • H879-AA SCSI Terminator • BN21L-OB cable 	HSZ52-AJ	0	2
Note: When an HSZ52-AJ is ordered, also order items 17 and 18.				
17	Rackmount StorageWorks controller shelf	BA35R-MR	0	2
18	SCSI Y cable, 68-pin	BN21W-0B	2	8

Netscape SuiteSpot TruCluster Available Server <i>HiTest</i> AppSet DIGITAL UNIX AlphaServer 4x00 <i>HiTest</i> Foundation				
<p style="text-align: center;">For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.digital.com:9003/cgi-bin/comet For a hardcopy of this Suite's <i>HiTest</i> Notes, order EK-HNSTA-HN.</p>				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
19	SCSI Tri-link connector	H885-AA	0	2
20	SCSI Differential terminator	H879-AA	0	6
21	Order one cable for each StorageWorks shelf that will be attached to the HSZ5X controller. Cable for Connection HSZ to Shelf	BN21N-02	2	8
22	PCI to Fast Ethernet Adapter	DE500-AA	0	2
23	10BaseT Twisted-Pair Ethernet Cable	BN25G-07	2	4
24	Select one high-resolution color monitor: 15-in Flat-square with 0.28 dot pitch 17-in Trinitron aperture grille, 0.26mm 21-in Diamondtron aperture grille, 0.30mm	SN-VRCX5-WA SN-VRCX7-WA SN-VRCX1-WA	1	2
Foundation Software				
25	DIGITAL UNIX V4.0B	Included with Item 2		
26	DIGITAL UNIX V4.0B CD-ROM Media	QA-MT4AA-H8	1	1
27	StorageWorks PLUS Includes: • Networker Save and Restore for DIGITAL UNIX V4.3 • Logical Storage Manager (LSM) • AdvFS Utilities	QB-5RYAG-AA	1	2
28	TruCluster Available Server V1.4A License and documentation Note: Media is provided in item 26.	QB-05SAG-AA	2	2
29	Order 1 kit for the first HSZ52-AJ ordered. StorageWorks Platform kit (DIGITAL UNIX) Includes: • HSOF software V5.1 • StorageWorks Command Console	QB-5JCAB-SA	0	1
30	When more than one HSZ52-AJ is ordered, order one for each additional HSZ52. HSZ50 Array Controller Operating Software (HSOF) V5.1 LIC/MCD/DOC Kit	QB-5CJAA-SA	0	3
31	System Management Station	See Table 2-2	0	1

Table 2-2: System Management Station Template

Netscape SuiteSpot TruCluster Available Server HiTest AppSet System Management Station				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
System Management Station Hardware				
Note: This HiTest Suite supports the use of a system management station. When the management station option is included, this HiTest Template identifies the items required. When system management is to be provided through other means, this option may be omitted without invalidating the HiTest Suite.				
1	DIGITAL PWS 200i Personal Workstation for Windows NT <i>Hardware includes:</i> <ul style="list-style-type: none"> • 200 MHz CPU with 256 KB cache • 32 MB memory • AccelPro 2500TX Graphics • 10BaseT/10Base2 Ethernet • 2.0 GB UW disk • EIDE CD-ROM • 1.44 MB floppy drive • PS/2 style keyboard • Two-button PS/2 compatible mouse <i>Software includes:</i> <ul style="list-style-type: none"> • Windows NT Workstation 4.0 Note: A functionally equivalent X86 system may be substituted without invalidating this HiTest Template.	SN-B3KAP-EL	1	1
2	<i>Select one high-resolution color monitor:</i> 15-in Flat-square with 0.28 dot pitch 17-in Trinitron aperture grille, 0.26mm 21-in Diamondtron aperture grille, 0.30mm	SN-VRCX5-WA SN-VRCX7-WA SN-VRCX1-WA	1	1
System Management Station Software				
3	Windows NT Workstation V4.0	Included with item 1	1	1
4	Windows NT Service Pack 3 Install Windows NT Service Pack 3 available from ftp://ftp.microsoft.com/bussys/winnt	Microsoft	1	1
5	Exceed V6.0 For more information on Exceed V6.0, see http://hummingbird.com	Hummingbird	1	1
6	ServerWORKS Manager V2.2A (QB-4QYAA-SA)	Included with the AlphaServer	1	1
7	StorageWorks Command Console V1.1 (QB-4GZAA-SA)	Included with StorageWorks platform kit	1	1
8	BMC PATROLWATCH for ServerWORKS	Included with the AlphaServer	0	1
Note: Items 9-12 are used with the System Management Station and are installed on the target AlphaServer system.				
9	Base UNIX systems management tools	Included with DIGITAL UNIX	0	2
10	BMC PATROL Agent	Included with the AlphaServer	0	2
11	BMC Operating System Knowledge Module	QB-5KLAA-WB	0	2
12	BMC Knowledge Module Middleware/Messaging Internet/Intranet	QB-5KWAA-WB	0	2

Table 2-3: Component Revision Levels

Hardware Component	Hardware	Firmware	Software
SRM Console	–	V 3.0-10	–
4.3 GB disk (DS-RZ1CB-VW)	A01	LJY0	–
4.3 GB disk (RZ29B-VW)	C02	0014	–
HSZ50	A01	V5.1	–
DEFPA-AB	A01	2.46	–
DE500-AA	A01	–	–
PALcode	–	–	V1.21-12
KZPSA	P02	P01-A10	–
AlphaBIOS	–	5.24-0	–
KZPDA	A01	–	–
Graphics board (PB2GA-JB)	2	–	–
StorageWorks shelf power supply (DS-BA35X-HH)	B01	–	–
Software Component		Version/Revision	Patch Level
Netscape SuiteSpot, which consists of the following:			–
Catalog Server		1.01	
Certificate Server		1.0	
Directory Server		1.01	
Enterprise Server		2.01	
LiveWire Pro		1.01	
News Server		2.01	
Mail Server		2.02	
Media Server		1.0	
Proxy Server		2.5	
DIGITAL UNIX for AlphaServer		4.0B	Patch Kit 1
Note: DIGITAL UNIX (0564) Patch Kit 1 (duv40b19700-b17er) was applied. To access DIGITAL patches, connect to http://www.service.digital.com/html/patch_public.html .			
DECEvent		2.6	–
StorageWorks PLUS, which includes:			–
Networker Save and Restore for DIGITAL UNIX		4.3	
Logical Storage Manager (LSM)			
AdvFS Utilities			
TruCluster Available Server		1.4A	–
StorageWorks Platform kit (DIGITAL UNIX)			–
HSOF software		5.1	
StorageWorks Solution Command Console		1.1	
System Management Station Software which includes:			–
Base UNIX System Management Tools		–	
DIGITAL ServerWORKS		2.0	
DIGITAL ServerWORKS Manager		2.2A	
Exceed		6.0	
BMC PATROLWATCH for ServerWORKS		2.0	
BMC PATROL Agent		3.0.15D	
BMC Operating System Knowledge Module		2.0	
BMC Knowledge Module Middleware/Messaging Internet/Intranet		1.0	
Windows NT Workstation		4.0	Service Pack 3 (SP3)

Special Configuration Rules

The special configuration rules for the Netscape SuiteSpot TruCluster Available Server HiTest Suite include:

- Increase vm-map entries to 20000 from the default value of 200. See the kernel parameters as shown in Table 3-1.
- AdvFS Utilities must be used to configure all file systems.
- The maximum number of disks per HSZ52 is 36.
- Put all tape devices on the local shelf.
- Do not use static routing.

StorageWorks Issues

Use the following guidelines with Table 2-1 to order the correct quantities of specific StorageWorks parts for your configuration.

StorageWorks configurations are based on Storage Building Blocks (SBBs). The Cabinet StorageWorks Shelf (BA36R-RA) called for by this HiTest Suite can hold up to seven SBBs. Table 2-4 shows the components that can be connected to the Cabinet StorageWorks shelf and the number of SBBs that each represents.

Table 2-4: Storage Building Blocks

Component	Part Number	SBBs
UltraSCSI disk drives	DS-RZ1CB-VW	1
SCSI DAT tape drive	TLZ09-VA	1
Tape loader	TLZ9L-VA	3
StorageWorks shelf signal converter	DWZZB-VW	1

Although Table 2-1 shows the minimum number for both DWZBBs and HSZ52s as zero, one or the other must be present so that the two systems can share a SCSI bus. Note that the maximum number of DWZBBs configurable for a system is reduced by one for each HSZ52 present. Also, if a DWZZB is dual connected, the number of disks that can be configured for the shelf is reduced by one. For more information, see the section DWZZB Configuration in Chapter 3.

Table 2-5 shows a range of StorageWorks configurations that are possible within this HiTest Suite. It illustrates the kinds of tradeoffs that should be considered when ordering components from Table 2-1.

Table 2-5: Sample StorageWorks Configurations

Part Number	Tested Maximum	Configurable Mid-range	Tested Minimum
DS-RZ1CB-VW	82	30	6
TLZ09-VA	1	1	0
TLZ9L-VA	1	1	0
DWZZB-VW	2	4	1
HSZ52-AJ	2	0	0

System Installation and Setup

This chapter presents information that is useful when installing and setting up a DIGITAL HiTest System configured from this DIGITAL HiTest Suite. System preparation includes installation of the hardware, operating system, and applications.

Note that examples are based on the maximum HiTest configuration. When screen displays are repetitive, vertical ellipsis points indicate that part of the log has been deleted from the example.

Hardware Installation

The hardware is installed and interconnected as shown in Appendix A. Before configuring your system, see the Special Configuration Rules in Chapter 2.

Installation of KZPSAs

In the maximum configuration, KZPSA-BBs are used to connect the two systems to HSZ50s through shared SCSI buses. Set the SCSI ID to 6 on one system and 7 on the other, as the following describes.

If the system is running, bring it down to console mode with the following command:

```
# shutdown -h now
```

The following procedure shows how to check the value of the SCSI IDs and change them if necessary:

1. Check the shared KZPSA option settings on both systems, as follows:

```
P00>>>show kzp*
kzpsa0_fast          1
kzpsa0_host_id      7      ←1st shared bus
kzpsa0_termprwr     1
kzpsa1_fast          1
kzpsa1_host_id      7      ←2nd shared bus
kzpsa1_termprwr     1
kzpsa2_fast          1
kzpsa2_host_id      7      ←3rd shared bus
kzpsa2_termprwr     1
kzpsa3_fast          1
kzpsa3_host_id      7      ←4th shared bus
kzpsa3_termprwr     1
```

2. If the SCSI IDs of the shared KSPSAs are set to the same number on both systems, set the SCSI IDs on one of the systems to a different number, as follows:

```
P00>>>set kzpsa0 host_id 6
P00>>>set kzpsa1 host_id 6
```

System Installation and Setup

```
P00>>>set kzpsa2_host_id 6
```

```
P00>>>set kzpsa3_host_id 6
```

3. Recheck the shared KZPSA option settings, as follows:

```
P00>>>show kzp*
```

4. Check all devices:

```
P00>>>show dev
```

```
polling ncr0 (NCR53C810) slot 1, bus 0 PCI, hose 1 SCSI Bus ID7
dka500.5.0.1.1 DKa500 RRD45 0436
polling isp0 (ISP1020) slot 0,bus 2, PCI hose 1 SCSI Bus ID 7
dkb0.0.2000.1 DKb0 RZ1CB-CA LYJ0
dkb100.1.0.2000.1 DKb100 RZ1CB-CA LYJ0
dkb200.0.0.2000.1 DKb200 RZ1CB-CA LYJ0
dkb300.0.0.2000.1 DKb300 RZ1CB-CA LYJ0
MKb600.0.0.2000.1 MKb600 TLZ9 A020
JKb601.0.0.2000.1 JKb601 TLZ9 A020
Polling kzpsa0 (KZPSA) slot 3, bus 0, PCI hose 1 TPwr 1 Fast 1
Bus ID 7
kzpsa0.7.0.3.1 dkc TPwr 1 Fast 1 Bus ID 7 P01 A10
dkc100.1.0.3.1 DKc100 RZ29B 0014
Polling kzpsa1 (KZPSA) slot 5, bus 0, PCI hose 1 TPwr 1 Fast 1
Bus ID 7
kzpsa0.7.0.3.1 dkd TPwr 1 Fast 1 Bus ID 7 P01 A10
dkd000.1.0.3.1 DKd000 HSZ50-AX V51Z
dkd004.1.0.3.1 DKd004 HSZ50-AX V51Z
dkd100.1.0.3.1 DKd100 HSZ50-AX V51Z
dkd101.1.0.3.1 DKd101 HSZ50-AX V51Z
dkd102.1.0.3.1 DKd102 HSZ50-AX V51Z
dkd103.1.0.3.1 DKd103 HSZ50-AX V51Z
dkd104.1.0.3.1 DKd104 HSZ50-AX V51Z
dkd200.1.0.3.1 DKd200 HSZ50-AX V51Z
dkd204.1.0.3.1 DKd204 HSZ50-AX V51Z
dkd300.1.0.3.1 DKd300 HSZ50-AX V51Z
dkd303.1.0.3.1 DKd303 HSZ50-AX V51Z
dkd304.1.0.3.1 DKd304 HSZ50-AX V51Z
Polling kzpsa2 (KZPSA) slot 4, bus 0, PCI hose 0 TPwr 1 Fast 1
Bus ID 7
kzpsa0.7.0.3.1 dke TPwr 1 Fast 1 Bus ID 7 P01 A10
dke100.1.0.3.1 DKe100 RZ29B 0014
Polling kzpsa3 (KZPSA) slot 5, bus 0, PCI hose 0 TPwr 1 Fast 1
Bus ID 7
kzpsa0.7.0.3.1 dkf TPwr 1 Fast 1 Bus ID 7 P01 A10
dkf000.1.0.3.1 DKf000 HSZ50-AX V51Z
dkf001.1.0.3.1 DKf001 HSZ50-AX V51Z
dkf002.1.0.3.1 DKf002 HSZ50-AX V51Z
dkf100.1.0.3.1 DKf100 HSZ50-AX V51Z
dkf101.1.0.3.1 DKf101 HSZ50-AX V51Z
dkf102.1.0.3.1 DKf102 HSZ50-AX V51Z
dkf200.1.0.3.1 DKf200 HSZ50-AX V51Z
dkf201.1.0.3.1 DKf201 HSZ50-AX V51Z
dkf202.1.0.3.1 DKf202 HSZ50-AX V51Z
dkf300.1.0.3.1 DKf300 HSZ50-AX V51Z
dkf301.1.0.3.1 DKf301 HSZ50-AX V51Z
dkf302.1.0.3.1 DKf302 HSZ50-AX V51Z
```

```
polling pfi0 (FDDI) slot 4,bus 0, PCI hose 1
fwa0.0.0.4.0      00-00-F8-6B-14-72
polling tulip0 (DECchip 21140-AA) slot 3,bus 0, PCI hose 0
ewa0.0.0.5.0      00-00-F8-02-E1-77      Fast
```

5. Check the CPUs, as follows:

```
P00>>>show cpu
Primary CPU:      00
Active CPUs:     00    01    02    03
Configured CPUs: 00    01    02    03
SROM Revision:   V2.0  V2.0  V2.0  V2.0
```

6. Check the amount of Memory:

```
P00>>>show mem
Slot      Type      MB      Base Address
-----
0         EDO       1024    0
1         EDO       1024    40000000
```

7. Check the boot device settings, as follows:

```
P00>>>show boot*
boot_dev      dkb0.0.2000.1
boot_file
boot_osflags  A
boot_reset    OFF
bootdef_dev   dkb0.0.2000.1
booted_dev
booted_file
booted_osflags
```

Proceed to the installation of the HSZ50s on both systems.

Installation of HSZ50s (Maximum Configuration Only)

This section describes the configuraton of the stripesets on the HSZ50s used in the maximum configuration. No stripesets are used in the minimum configuration.

The HSZ50 software (HSOF) is shipped separately. The HSZ will not function without the HSOF software (QB-5CJAA-SA).

Connect a serial terminal (vtxxx) to the first HSZ50 serial port. After the HSZ50 has been powered on, enter the following commands from the terminal to create and verify the controller configuration:

Note

Refer to *Configuring Your StorageWorks Subsystem (EK-HSZ50-CG)* for a complete description of the HSZ50 configuration procedures.

1. Verify that the HSZ50 firmware (HSOF) is at revision 5.1, the cache size is 64 MB and is in a GOOD state, and the battery state is GOOD:

```
HSZ> sho this
Controller:
HSZ50-CX ZG61200944 Firmware V51Z-0, Hardware A01
Not configured for dual-redundancy
SCSI address 7
Time: NOT SET
```

System Installation and Setup

```
Host port:
  SCSI target(s) (0), No preferred targets
Cache:
128 megabyte write cache, version 2      (64 MB per HSZ50)
Cache is GOOD                            (128 MB per HSZ52)
Battery is GOOD
No unflushed data in cache
CACHE_FLUSH_TIMER = DEFAULT (10 seconds)
CACHE_POLICY = A
Host Functionality Mode = A
```

2. Set up the HSZ52 (HSZ50 pair) to enable the failover dual redundancy, as follows:

```
HSZ> set this prompt="HSZ1_1> "
HSZ1_1> set this time=16-MAY-1997:11:00:00
HSZ1_1> set failover copy = this
HSZ1_1> set this id = 1,2,3,4
HSZ1_1> set this PREFERRED_ID = 1,2
```

3. Connect to the second HSZ50:

```
HSZ> set this prompt="HSZ1_2> "
HSZ1_2> set nofailover
HSZ1_2> set this id = 1,2,3,4
HSZ1_2> set this PREFERRED_ID = 3,4
HSZ1_2> restart other
HSZ1_2> restart this
```

4. Display the HSZ50 configuration again, as follows:

```
HSZ1_1> show this
Controller:
HSZ50-AX ZG71124885 Firmware V51Z-0, Hardware A01
Configured for dual-redundancy with ZG71024492
In dual-redundant configuration
SCSI address 7
Time: 16-MAY-1997:11:00:00
```

```
Host port:
  SCSI target(s) (1, 2, 3, 4), Preferred target(s) (1, 2)
TRANSFER_RATE_REQUESTED = 10MHZ
Cache:
64 megabyte write cache, version 3
Cache is GOOD
Battery is GOOD
No unflushed data in cache
CACHE_FLUSH_TIMER = DEFAULT (10 seconds)
CACHE_POLICY = A
NOCACHE_UPS
Host Functionality Mode = A
HSZ1_1>
HSZ1_1> show other
Controller:
HSZ50-AX ZG71024492 Firmware V51Z-0, Hardware A01
Configured for dual-redundancy with ZG71124885
In dual-redundant configuration
SCSI address 6
Time: NOT SET
```

```

Host port:
SCSI target(s) (1, 2, 3, 4), Preferred target(s) (3, 4)
TRANSFER_RATE_REQUESTED = 10MHZ
Cache:
64 megabyte write cache, version 3
Cache is GOOD
Battery is GOOD
No unflushed data in cache
CACHE_FLUSH_TIMER = DEFAULT (10 seconds)
CACHE_POLICY = A
NOCACHE_UPS
Host Functionality Mode = A
HSZ1_1>

```

5. Check the disk layout:

```

HSZ1_1> show dev

```

Name	Type	Port	Targ	Lun	Used by
DISK100	disk	1	0	0	
DISK110	disk	1	1	0	
DISK120	disk	1	2	0	
DISK130	disk	1	3	0	
DISK140	disk	1	4	0	
DISK150	disk	1	5	0	
		.			
		.			
		.			
DISK600	disk	6	0	0	
DISK610	disk	6	1	0	
DISK620	disk	6	2	0	
DISK630	disk	6	3	0	
DISK640	disk	6	4	0	
DISK650	disk	6	5	0	

6. To automatically configure storage sets, use the StorageWorks HSZ50 Array Controller Utility for DIGITAL UNIX (the CFMENU utility).

```

HSZ_1> run cfmenu

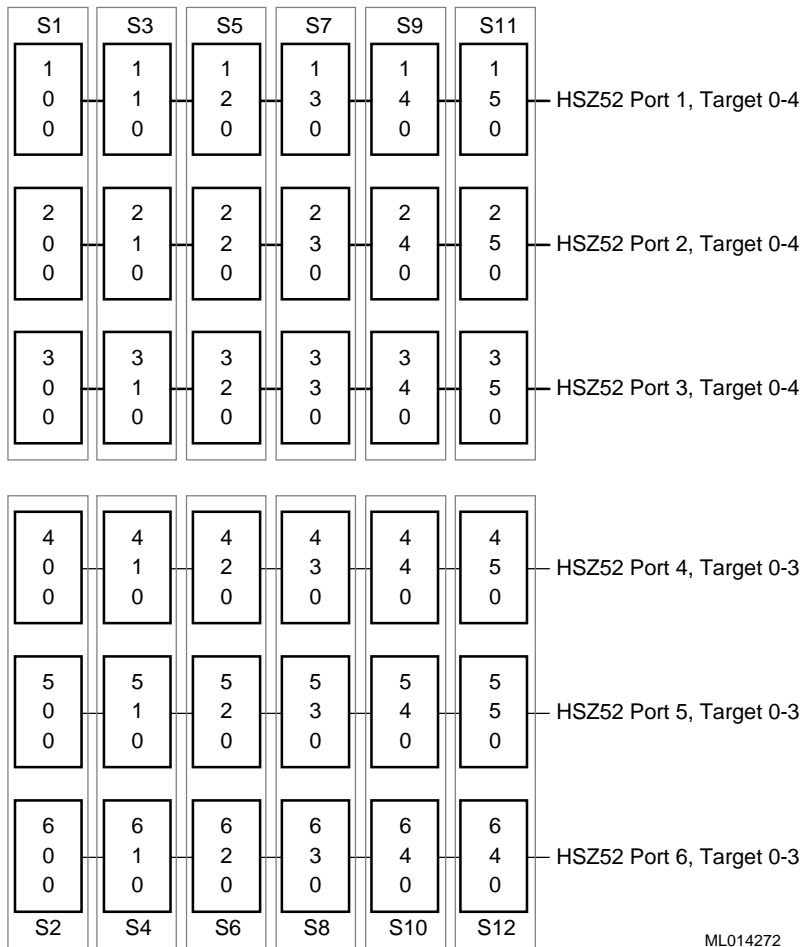
```

7. Choose the type of storage set you want to create: mirrorset, stripeset, or RAIDset. The HiTest systems were configured as stripesets which were mirrored using Logical Storage Manager (LSM).

CFMENU displays a storage set menu that corresponds to your choice and prompts you for the information it needs to configure the storage. For more information, see the chapter on automatically configuring storage sets in *Configuring Your StorageWorks Subsystem* (EK-HSZ50-CG).

8. Configure the stripesets. Refer to Figure 3-1 for an example of how the stripesets were set up for the maximum configuration of this HiTest Suite. To increase performance, make sure that each member of a stripeset is located on a different HSZ52 SCSI bus port.

Figure 3-1: Netscape SuiteSpot TruCluster Available Server Disk Striping



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9. Add units using the list of unassigned disks displayed by CFMENU.
10. Exit CFMENU.
11. Display the current units and disks, as follows:

```

HSZ1_1> show units
LUN                                     Uses
-----
D100                                    S1
D101                                    S3
D102                                    S5
.
.
.
D400                                    S8
D401                                    S10
D402                                    S12
HSZ1_1> show disk
Name          Type      Port Targ  Lun    Used by
-----
DISK100      disk      1    0    0      S1
DISK110      disk      1    1    0      S3
DISK120      disk      1    2    0      S5
DISK130      disk      1    3    0      S7
    
```

DISK140	disk	1	4	0	S9
DISK150	disk	1	5	0	S11
		.			
		.			
		.			
DISK600	disk	6	0	0	S2
DISK610	disk	6	1	0	S4
DISK620	disk	6	2	0	S6
DISK630	disk	6	3	0	S8
DISK640	disk	6	4	0	S10
DISK650	disk	6	5	0	S12

- Perform the same procedure for the second HSZ52, which is the second member in the LSM mirrorset. The disk configuration of this HSZ52 must be equal to that of the first.

DWZZB Configuration

In the maximum configuration, the two systems shared two SCSI buses which were connected to two shelves by way of DWZZBs. In addition, two HSZ52s were also on shared SCSI buses.

Each shelf held one additional DS-RZ1CB, which brought the number of disks to the maximum allowed for the HiTest configuration.

If the maximum HSZ52 configuration is not used, additional disks can be configured using DWZZBs to connect the shared buses. These disks can be striped, mirrored, or both using Logical Storage Manager (LSM). Figure 3-2 illustrates the tested configuration. Figure 3-3 illustrates a possible configuration without HSZ52s.

Figure 3-2: Netscape Suite TruCluster Available Server DWZZB Configuration

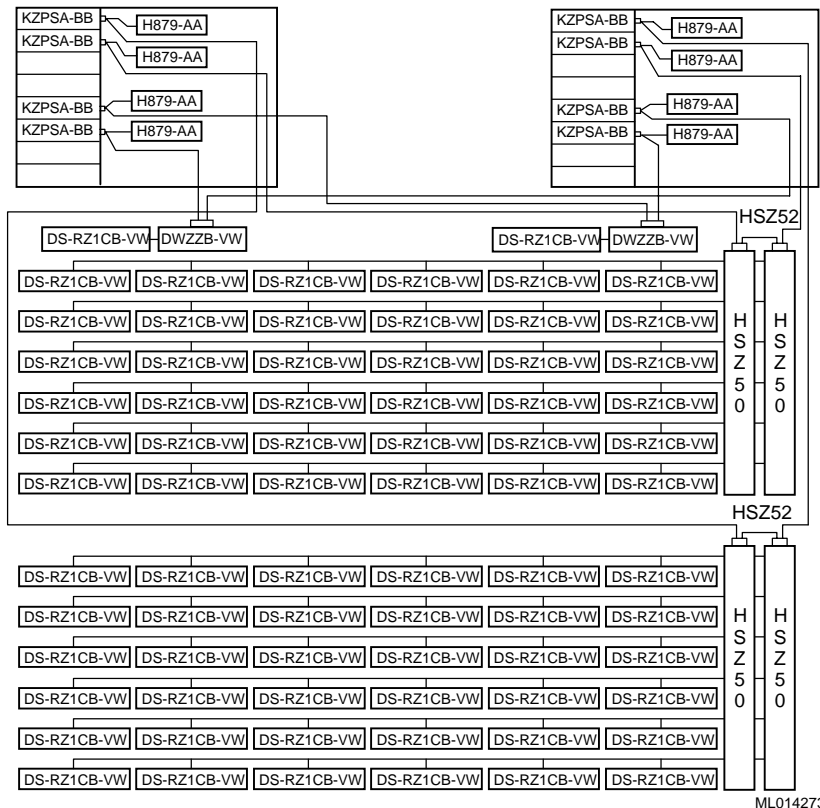
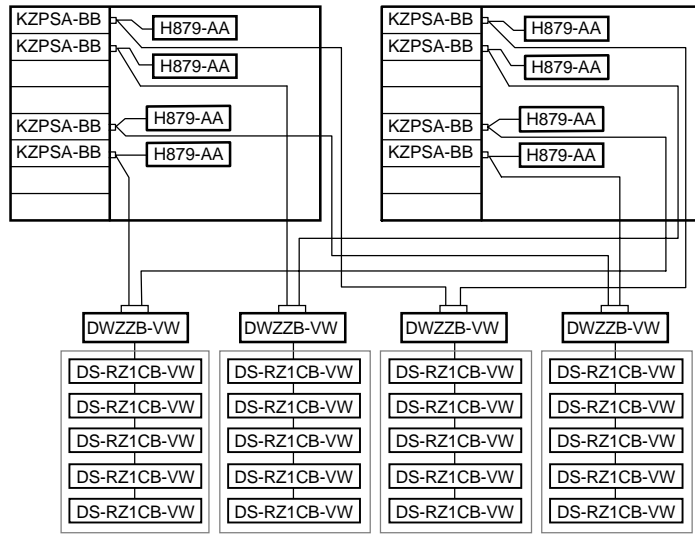


Figure 3-3: DWZZB Configuration Without HSZ52s



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Operating System Installation

Install the DIGITAL UNIX 4.0B operating system with all kernel options.

1. Boot the CD containing the DIGITAL UNIX 4.0B distribution
`P00>>>boot dka500`
2. Follow the steps in the *DIGITAL UNIX Installation Guide Version 4.0B* (or higher) (Part Number: AA-QTLGB-TE).

Patch Kit Installation

After the operating system installation is complete, apply Patch Kit 1 (duv40b19700-bler), which can be obtained from:

http://www.service.digital.com/html/patch_public.html.

To install the UNIX V4.0B patch kit from a tar file:

1. Copy the patch kit and the installation guide to the system.
2. Create a patches directory and copy the tar file to it.
3. Untar the patch kit onto the system.

```
# mkdir /patches
# cd /patches
# tar -xpvf 'PATCHKIT-NAME.tar'
```

4. Shut down the system to single-user mode.
5. After the system shuts down to single-user mode, use the `bcheckrc` command to check and mount all the UFS and AdvFS file systems, then issue the `update` command and activate the swap partition with `swapon`:

```
# /sbin/bcheckrc
# /sbin/update
# /sbin/swapon -a
```

6. If you are using LSM, you should also run `lsmbstartup`:

```
# /sbin/lsmbstartup
```


7. Run the patch management utility to install the patches:

```
#dupatch
```
8. When the installation menu is presented, enter 1.
9. Enter 2 to have the program check your system and install the patch kit.
10. Respond when prompted for your name.
11. Enter the path to the patch kit (the directory containing the ./kit and ./doc subdirectories) /patches/patch_kit.
12. Respond to the prompts as follows:

```
Do you want the patches to be reversible? [y] y
Do you want to proceed with the installation with this setup?
[y/n]: y
```
13. Install all patches through the patch selection menus.
14. After the patch installation is completed, save a copy of the running kernel and build a new kernel:

```
# cp /vmunix /vmunix.pre_patch
# doconfig -c YOURSYSTEM_NAME
```
15. Indicate whether or not you want to edit the configuration file:

```
Do you want to edit the configuration file? (y/n) n
```

When the /usr/sbin/doconfig program finishes, it displays a message showing the full pathname of the new vmunix kernel.
16. Move the new vmunix kernel to /vmunix as follows:

```
# mv /usr/sys/YOURSYSTEM_NAME/vmunix /vmunix
```
17. Reboot the system.

UNIX Kernel Parameters (/etc/sysconfigtab)

Edit the UNIX kernel file /etc/sysconfigtab to contain the parameter settings listed in Table 3-1.

Table 3-1: Kernel Parameters

Parameter	Value
vm parameters:	
vm-maxvas	1073721824
vm-vpagemax	131072
vm-ubc-maxpercent	100
vm-mapentries	20000
new-wire-method	1
rt parameters:	
aio-max-num	1024
aio-max-percent	2

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Parameter	Value
proc parameters:	
max-proc-per-user	1024
max-threads-per-user	1024
num-netconfig	2
max-netdevs	24
netdev_0	tu0
netdev_1	fta0
ifconfig_0	xxx.xxx.xxx.xxx netmask 255.0.0.0 *
ifconfig_1	xxx.xxx.xxx.xxx netmask 255.0.0.0 *
max-users	512
new-wire-method	1
* The default netmask value is shown. Get the correct value for your local network configuration from your network administrator.	

Labeling the Disks

The disks used for the operating system are labeled automatically during installation.

The shared disks have to be labeled on only one of the servers. The other system will recognize the labels automatically.

At the UNIX command line, enter commands in the following format to label the disks in your configuration. The example shows the labeling of the disks in the maximum configuration.

```
# disklabel -z /dev/rz34
# disklabel -z /dev/rz17
# disklabel -wr /dev/rz24 HSZ50
# disklabel -wr /dev/rz25 HSZ50
# disklabel -wr /dev/rz26 HSZ50
# disklabel -wr /dev/rz27 HSZ50
# disklabel -wr /dev/rzb25 HSZ50
# disklabel -wr /dev/rzc25 HSZ50
# disklabel -wr /dev/rzd25 HSZ50
# disklabel -wr /dev/rze24 HSZ50
# disklabel -wr /dev/rze25 HSZ50
# disklabel -wr /dev/rze26 HSZ50
# disklabel -wr /dev/rze27 HSZ50
# disklabel -wr /dev/rzd27 HSZ50
```

Partitioning of Operating System Disks

The local disks are partitioned as follows:

Disk	Minimum Configuration	Maximum Configuration
rz8a	/	/
rz8b	primary swap	primary swap
rz9	/usr and /var	/usr
rz10		/var
rz11c		secondary swap

Set the swap mode to *lazy*.

TruCluster Available Server

Install the TruCluster Available Server Software. The software is located on the DIGITAL UNIX V4.0B Associated Products Volume 2 - December 1996 CD-ROM.

The TruCluster Available Server documentation can be found at the following web site:

http://www.unix.digital.com/faqs/publications/cluster_doc/TruCluster_bookshelf.html

This online documentation library includes:

Release Notes
Hardware Configuration and Software Installation
Available Server Environment Administration

You should also familiarize yourself with the following files located at:

`/<CD-Mountpoint>/DOCUMENTATION/TCR/TEXT`

`TCR_USING_ON_4.0B.TXT`
`AS_LETTER.TXT`
`AS_SPD.TXT`
`AS_Version1.4_CLD_Fixes.TXT`

To install and configure TruCluster Available Server:

1. Before you install TruCluster Available Server, add each host's name and IP address to the other nodes `/etc/hosts` file.
2. Install TruCluster software on both AlphaServers, as follows:
3. Start the installation and select the 3) ALL mandatory and optional subsets option:

```
# cd /<CD-Mountpoint>/TCR140
# setld -l
```
4. Enter the information in the following format, as prompted by the installation program. Italics indicate system-specific responses. The example shows the maximum configuration.

```
Enter the IP name for the member network interface
[systemname]: systemname
You chose "systemname," IP 1.0.0.1 using interface fta0
```

```
Do you want to run the ASE logger on this node? [n]: y
```

```
The ASE I/O Bus Renumbering Tool has been invoked.
Select the controllers that define the shared ASE I/O buses.
```

	Name	Controller	Slot	Bus	Slot
)	scsi0	psiop0	0	pci1	1
)	scsi1	isp0	0	pci2001	0
2)	scsi2	pza0	0	pci1	3
3)	scsi3	pza1	0	pci1	4
4)	scsi4	pza2	0	pci1	5
5)	scsi5	pza3	0	pci0	3

```
q) Quit without making changes
```

```
Enter your choices (comma or space separated):q
```

5. Exit the I/O Controller Name Specification Menu.
All controllers connected to an I/O bus must be named the same on all ASE members. Enter the controller names for all

System Installation and Setup

shared ASE I/O buses by assigning them one at a time or all at once with the below options.

	Name	New Name	Controller	Slot	Bus	Slot
1)	scsi2	scsi2	pza0	0	pci1	3
2)	scsi3	scsi3	pza1	0	pci1	4
3)	scsi4	scsi4	pza2	0	pci1	5
4)	scsi5	scsi5	pza3	0	pci0	3

f) Assign buses starting at a given number
p) Assign buses as was done in pre-ASE V1.3
v) View non shared controllers
s) Show previous assignments
r) Reapply previous assignments
q) Quit without making any changes
x) Exit (done with modifications)
Enter your choice [f]: **x**

6. The kernel is rebuilt after exiting from the menu. Check the kernel files, then move them and reboot, as follows:

```
# ls -l /vm*  
-rwxr-xr-x 1 root system 12260144 May 26 10:02 /vmunix  
-rwxr-xr-x 1 root system 12240512 May 23 15:05 /vmunix.bef_patch
```

Move the kernel:

```
# mv /vmunix /vmunix.bef_ase  
# mv /sys/systemname/vmunix /vmunix  
# ls -l /vm*  
-rwxr-xr-x 1 root system 12406448 Jun 3 09:09 /vmunix  
-rwxr-xr-x 1 root system 12260144 May 26 10:02 /vmunix.bef_ase  
-rwxr-xr-x 1 root system 12240512 May 23 15:05 /vmunix.bef_patch
```

Reboot the system:

```
# reboot
```

7. Repeat steps 1 through 6 on the second server.

Note

If the configuration in `/sys/conf/systemname` is changed, especially SCSI setup, run `/var/ase/sbin/ase_fix_config` again to make the changes work with TruCluster V1.4. However, changing SCSI assignments will invalidate any volume definition that may exist then.

Configuring a Server with ASEMGR

Configure one of the servers using ASEMGR. Note that it is important that only one of the servers be configured, with the second node added to this configuration. If the second node is configured separately, failover will not work.

To configure an available server:

1. Start ASEMGR on one of the systems.
2. Configure an available server using ASEMGR.
3. Add the second node to the Available Server Environment on the first node.

Logical Storage Manager (LSM)

The Logical Storage Manager (LSM) software and license are included with DIGITAL UNIX. To install LSM, select the LSM option during the DIGITAL UNIX installation. Additional licenses for using enhanced LSM features are not required.

To use LSM with TruCluster Available Server (ASE), set up LSM and create a rootdg disk group on all the member systems.

For more information about LSM utilities, display the manpages for volintro:

```
# man volintro
```

volinstall

To set up the LSM environment, use the /usr/sbin/volinstall command.

This command also sets up the system for automatic LSM start at boot time (see /etc/inittab).

```
# volinstall
```

volsetup

Run volsetup to create the rootdg. Partition h of the system disk will be used.

With the volsetup command:

- vold is initialized
- root disk group (rootdg) is initialized

Remember, the rootdg disk group not only has information of its own disk group, but also from all other disks and disk groups defined with LSM.

In the examples which accompany the following procedure, the maximum HiTest configuration was used.

1. Start the volsetup utility. When you create the rootdg disk group on each member system, specify a disk on the system's local SCSI bus. Do not specify a disk that is on the Available Server shared bus.

```
# volsetup rz8h
```

```
Approximate maximum number of physical disks that will be
managed by LSM? [10] 90
```

```
Initialize vold and the root disk group as rz8h
```

```
Add disk rx8h to the root disk group as rz8h
addition of disk rz8h as rz8h succeeded.
```

```
Initialization of vold and the root disk group was
successful.
```

Note

LSM setup is the same on both systems. When LSM setup is done for one server, TruCluster performs the LSM setup on the second server automatically.

Steps 2 through 7 describe how to initialize and mirror one pair of disks. You can create a script capturing these steps for each mirrorset, or you can repeat the commands in each step for all disks that will use LSM.

System Installation and Setup

2. Initialize a pair of disks that will mirror each other using LSM:

```
# voldisksetup -i rz24
# voldisksetup -i rz40
```

3. Create the disk group for the mirrorset and assign a media name to the first disk:

```
# voldg init dg1 disk24=rz24
```

4. Create the LSM mirrored volume and specify its size:

```
# volassist -g dg1 make vol01 12000m
```

5. Add the second disk to the LSM disk group and assign it a media name:

```
# voldg -g dg1 adddisk disk40=rz40
```

6. Create a mirrorset in the background, consisting of the pair of disks added to the disk group:

```
# volassist -g dg1 mirror vol01 &
```

7. Repeat steps 1 through 6 for all the disks being mirrored.

For each LSM volume that is created, an AdvFS file domain must be created on it. Advanced File System and Utilities for DIGITAL UNIX documentation can be found at: http://www.unix.digital.com/faqs/publications/base_doc/DOCUMENTATION/HTML/ADVFS_html/advfs_admin_guide.html.

For Help on AdvFS, display the advfs manpages:

```
# man advfs
```

1. Use the mkfdmn command to create each AdvFS domain:

```
# mkfdmn /dev/vol/dg1/vol01 s1
.
.
.
# mkfdmn /dev/vol/dg12/vol12 s12
```

2. Use the mkfset command to create a file set on each domain:

```
# mkfset s1 set1
.
.
.
# mkfset s12 set12
```

Applications

This section describes the Netscape SuiteSpot installation and configuration. Netscape SuiteSpot servers should be installed on both AlphaServers.

Netscape SuiteSpot products tested by HiTest and documented in these installation instructions consist of:

- Netscape Enterprise Server
- Netscape Mail Server
- Netscape News Server

To install other Netscape SuiteSpot servers, follow the instructions provided in the Netscape SuiteSpot documentation.

Netscape Enterprise Server

To install and configure Netscape Enterprise Server:

1. Mount the Netscape Enterprise Server CD-ROM using a command in the following format:

```
mount -t cdfs -o rrip /dev/rz5c /mnt (or other mount point)
```

2. Change directories as follows:

```
cd /mnt/decunix/entprise
```

3. Copy the following tar file to a temporary directory:

```
cp https.tar /tmp
```

4. Change to the temporary directory:

```
cd /tmp
```

5. Untar the file:

```
tar -xvof https.tar
```

6. Change to the directory created by untarring the file:

```
cd https
```

7. Run ns-setup, answer the questions as prompted, and take the defaults.

Netscape Mail Server

To install the Netscape Mail Server:

1. Use the `adduser` command to create an account called `mta` for mail.
2. Mount the Netscape Mail Server CD-ROM using a command in the following format:

```
mount -t cdfs -o rrip /dev/rz5c /mnt (or other mount point)
```

3. Change directories as follows:

```
cd /mnt/osf1
```

4. Run ns-setup, answer the questions as prompted, and take the defaults.

Netscape News Server

To install the Netscape News Server:

1. Use the `adduser` command to create a news account.
2. Mount the Netscape News Server CD-ROM using a command in the following format:

```
mount -t cdfs -o rrip /dev/rz5c /mnt (or other mount point)
```

3. Change directories as follows:

```
cd /mnt/osf1
```

4. Run ns-setup, answer the questions as prompted, and take the defaults.

Postinstallation Procedure

After both systems are installed, complete the configuration as follows:

From one of the two systems, copy the entire `NS-home` directory to the shared storage (the RAIDsets) using the `-r` and `-p` options.

Interoperability Tests and Results

This chapter describes how the tests were set up, what data and programs were placed on what disks, and how the tests were run.

This chapter describes:

- Test Environment
- Test Tools
- Test Configuration
- Test Process and Results

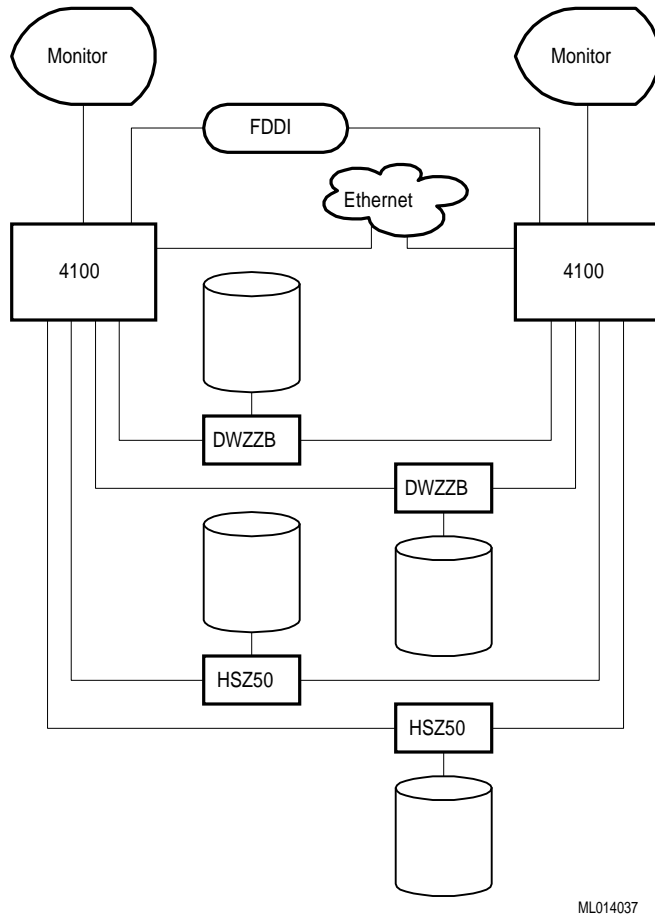
Overview of Results

Interoperability testing was performed successfully on the Netscape SuiteSpot TruCluster Available Server HiTest Suite. The tests verified that the servers functioned correctly.

Test Environment

Figure 4-1 shows the Netscape SuiteSpot TruCluster Available Server test environment.

Figure 4-1: Netscape SuiteSpot TruCluster Available Server Test Environment



Test Tools

The tools used for interoperability testing include the following:

- **WebTest, Version 1.1 (Internal Digital Equipment Corporation test tool)**

The WebTest exercises at the protocol and is browser independent. It consists of two parts: WebServer and WebClient.

The WebServer process creates verifiable pages on the server system. These range from 64 bytes to 64 Kbytes.

The WebClient process repeatedly reads and verifies all the pages created by WebServer.

- **NNTP, Version 1.1 (Internal Digital Equipment Corporation test tool)**

The NNTP (News) test consists of two parts: nntpPost and nntpRead. Both parts use the NNTP protocol as specified in RFC977. All tests are executed on load generation systems and affect data stored on the server system.

The nntpPost process creates verifiable news articles and sends them to the server. The message sizes and content vary according to a random distribution.

The nntpRead process reads and verifies the news articles.

- **MailTest, Version 1.1 (Internal Digital Equipment Corporation test tool)**

The MailTest consists of two parts: MailSender, which uses the Simple Mail Transfer Protocol (SMTP); and MailReceiver, which uses Post Office Protocol 3 (POP3). The messages are sent to multiple accounts.

The MailSender process creates verifiable mail messages and sends them to the server. The message sizes and content vary according to a random distribution.

The MailReceiver process reads and verifies the mail messages.

Test Configuration

The test load was generated as follows:

- Test load generated via 12 AlphaStation 600's running from an automated harness running on an additional AlphaStation 600.
- Network connections were Fast Ethernet (100BaseT) for all systems with an additional Fiber Distributed Data Interface (FDDI) connection for the larger configurations.

Minimum Configuration

- Hardware tested consisted of a pair of AlphaServer 4100s, each with a single 466 MHz processor and 512 MB of RAM.
- A single KZPSA-BB controller augmented the included KZPDA-AA SCSI controller for the disks.
- Network communication was via a DE500-AA Fast Ethernet adapter. Tape storage was provided by a single TLZ09-VA.

Maximum Configuration

- Hardware tested consisted of a pair of AlphaServer 4100s, each with two 466 MHz processors and 2 GB of memory.
- Two KZPSA-BB adapters on each system were connected to two HSZ52s using shared SCSI buses.
- Two HSZ52-AJ's were connected to six BA36R-RA shelves with six DS-RZ1CB-VW disks in each.
- Two additional shelves were connected directly to two of the four KZPSA-BBs via DWZZB-VWs in each.
- System storage (non-shared) was connected via a KZPDA and consisted of a single BA36R-RA with four DS-RZ1CB-VW disks.
- Tape storage was a TLZ9L-VA cartridge loader on one system and a TLZ09-VA tape drive on the other system.
- Network connectivity was provided by a Fast Ethernet (DE500-AA) and FDDI (DEFPA-AB) adapter. (The defined HiTest Suite calls for two DE500 adapters to increase network connectivity.)

Test Process and Results

Interoperability testing of Netscape SuiteSpot systems was performed on two AlphaServer 4100 systems.

Multiple WebTest, NNTP, and MailTest processes were started for both the minimum and maximum configurations. The following test results apply to all configurations tested:

- **WebTest** – The WebTest was accomplished by connecting directly to a server. All processes ran successfully.
- **NNTP** – The NNTP testing consisted of the posting and reading of articles. In all cases, the posting and reading of articles occurred successfully. All processes ran successfully.
- **MailTest** – The MailTest consisted of sending and receiving of messages. In all cases, the sending and receiving of messages occurred successfully. All processes ran successfully.

System Limits and Characterization Data

This chapter describes any system limits that may have been determined as a result of the testing, along with information about the system characterization during testing.

During an average of 12 hours of testing (per test), the system had the following performance characteristics:

- Web Test – Connected directly to the Web Server without a browser and processed over 104,000 pages per hour, with 2.1 GB transferred for the minimum configuration. Similarly, there were over 172,000 pages per hour with over 2.9 GB transferred for the maximum configuration. Pages ranged in size from 64 bytes to 64 Kbytes. For the purpose of comparing performance between different HiTest Suites, the HiTest program defined a unit of load rate used in these test results.

The minimum configuration had a load rating of 912.

A configuration with 1 GB of RAM had a load rating of 1034.

A configuration with 2 GB of RAM and one network adapter had a load rating of 1034.

The maximum configuration had a load rating of approximately 2068.

- Mail Testing – Occurred in two steps: sending and receiving messages.

The sender achieved a throughput of over 1350 messages per second.

The receivers achieved an average throughput of 15.2 messages per second with a total of over 600 MB being transferred.

- NNTP Testing – Occurred in two steps: posting and reading articles. Both posting and reading of articles were successful.

The reader achieved an average of 28.3 articles per minute with a total of over 17.4 GB being read.

The posting achieved an average throughput of 18.43 articles posted per minute with a total of over 18 GB being posted. The maximum configuration was slightly faster than the minimum configuration.

Problems and Resolutions

This chapter describes any problems that may have been encountered during the testing that have not been fixed and eliminated. The resolution provides the system manager or user with a fix or workaround for the problem.

The following problems were identified during testing:

Application

Netscape Enterprise Server

Problem An error occurs when trying to read more than 185 web pages, due to the lack of cache space. The error message is “Unable to access object.”

Resolution This error should not occur if the kernel is built using the parameters given in Table 3-1.

If this error does occur, increase `vm-mapentries` to the recommended value of 20000 by adding the following lines to `/etc/sysconfigtab`:

```
vm:  
vm-mapentries=20000
```

Reboot the system so the new value can take effect.

Problem On initial installation only, the News server did not post articles.

Resolution This is an unreproducible transient problem. In the unlikely event that you encounter this error, reinstall the News Server software.

TruCluster Available Server

Problem When converting Netscape products to Available Server configuration, the documentation points to the wrong directory.

Resolution Substitute the following directory specification:

```
/ns-home/httpacl/generated-https-*.acl
```

for the directory specification provided in the documentation:

```
/ns-home/http/generated-https-*.acl
```

Problems and Resolutions

Problem	Setting a secondary network interface does not work from within ASEMGR.
Resolution	At the present time, the Available Server is limited to a single network interface. Use primary networks only.

Detailed Hardware Configuration

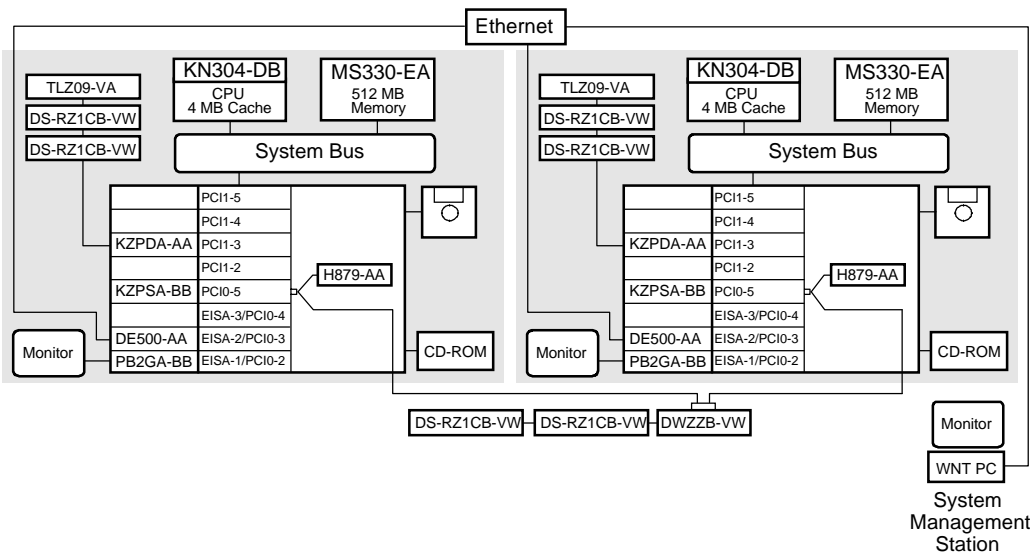
This appendix describes the minimum and maximum hardware configuration for the following:

- System Diagrams
- AlphaServer 4x00 configurations, including:
 - System motherboard
 - PCI slot usage
- Storage Configuration Cabling
- Disk Architecture

System Diagram

Figure A-1 and Figure A-2 show system diagrams of the minimum and maximum configurations of the HiTest Suite.

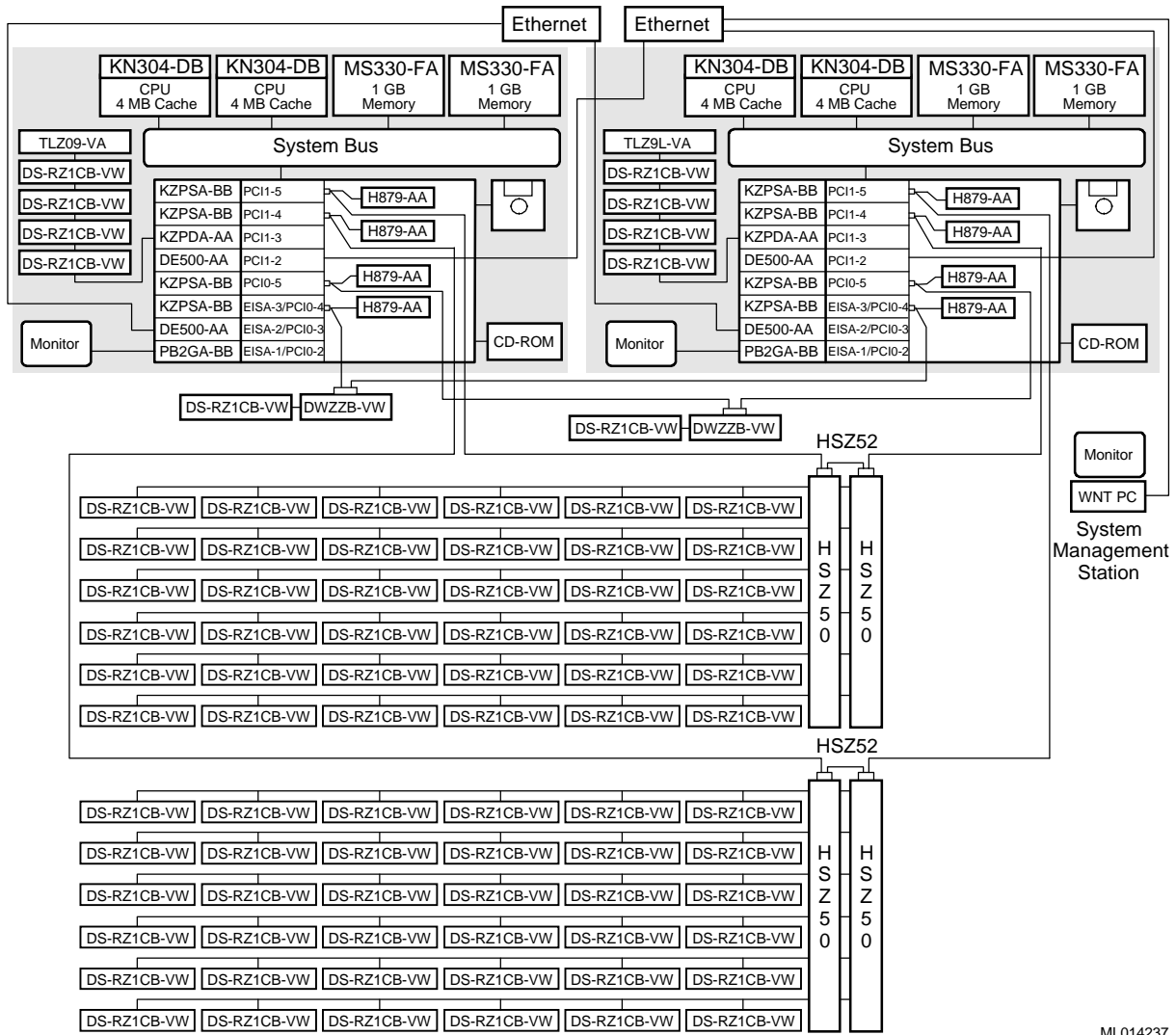
Figure A-1: Minimum Configuration System Diagram



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Detailed Hardware Configuration

Figure A-2: Maximum Configuration System Diagram



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AlphaServer 4x00 Configurations

The following sections show the AlphaServer 4x00 configurations.

System Motherboard

Figure A-3 and Table A-1 show the AlphaServer 4x00 system motherboard and describe the minimum and maximum hardware configuration. The configuration is similar for the AlphaServer 4000.

Figure A-3: System Motherboard

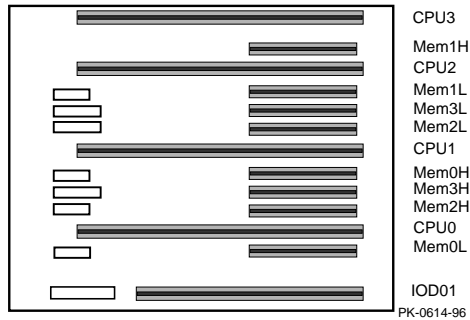


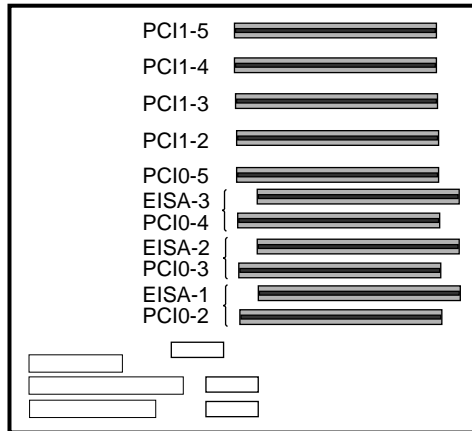
Table A-1: AlphaServer 4x00 System Motherboard (Minimum and Maximum Configurations)

Slot	Minimum Part Number	Maximum Part Number	Description
CPU3*	open	open	
Mem1H	open	MS330-FA	Memory pair 1 (2 of 2)
CPU2*	open	open	
Mem1L	open	MS330-FA	Memory pair 1 (1 of 2)
Mem3L	open	open	
Mem2L*	open	open	
CPU1	open	KN304-DB	466 MHz CPU 4 MB cache
Mem0H	MS330-EA	MS330-FA	Memory pair 0 (2 of 2)
Mem3H*	open	open	
Mem2H*	open	open	
CPU0	KN304-DB	KN304-DB	466 MHz CPU 4 MB cache
Mem0L	MS330-EA	MS330-FA	Memory pair 0 (1 of 2)
IOD01			
* These slots do not exist on the AlphaServer 4000 system.			

AlphaServer 4x00 PCI Slot Usage

Figure A-4 shows AlphaServer PCI slot usage. Table A-2 shows the PCI slot usage for the minimum and maximum hardware configurations of this HiTest Template.

Figure A-4: AlphaServer 4x00 PCI Motherboard



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Table A-2: PCI Slot Usage (Minimum and Maximum Configurations)

Slot	Minimum Configuration Options	Maximum Configuration Options	Description
PCI1-5	KZPSA-BB	KZPSA-BB	PCI FWD SCSI Adapter
PCI1-4	open	KZPSA-BB	PCI FWD SCSI Adapter
PCI1-3	KZPDA-AA	KZPDA-AA	PCI to SCSI adapter
PCI1-2	DE500-AA	DE500-AA	Ethernet adapter
PCI0-5	open	KZPSA-BB	PCI FWD SCSI Adapter
PCI0-4	open	KZPSA-BB	PCI FWD SCSI Adapter
PCI0-3	open	DEFPA-AA	PCI to FDDI adapter
PCI0-2	PB2GA-JB	PB2GA-JB	PCI-based S3 Trio Video card

Storage Configuration Cabling

Table A-3 lists the major cables in the HiTest Template. Use this table with Figure A-1 and Figure A-2.

Table A-3: Storage Configuration Cabling

Part Number	Min Qty	Max Qty	Description	From	To
BN21W-0B	2	8	SCSI Y cable	KZPSA-BB	Shared SCSI buses
BN21K-03	1	4	Shared SCSI buses	SCSI Y-cable	Tri-link connector
BN21K-10	0	4	Shared SCSI buses	SCSI Y-cable	HSZ52
BN21L-0B	0	2	Shared SCSI buses	HSZ52	HSZ52
BN21N-02	0	8	8/16-bit SCSI buses	HSZ52	StorageWorks shelves

Disk Architecture

Table A-4 lists the architecture of the disk subsystem for the HSZ52 StorageWorks Array Controllers. The stripesets on SCSI1 are mirrored on SCSI3 through the use of Logical Storage Manager (LSM), which results in a RAID configuration of RAID 0+1.

Table A-4: Disk Architecture

SCSI Bus	Logical Unit (LUN)	Stripeset	RAID Level	Member Drives
SCS0	rz17		0	4.3 GB
SCSI1	rz24	S1	0	3 each 4.3 GB
	rz25	S2	0	3 each 4.3 GB
	rz26	S3	0	3 each 4.3 GB
	rz27	S4	0	3 each 4.3 GB
	rz2b25	S5	0	3 each 4.3 GB
	rz2c25	S6	0	3 each 4.3 GB
	rz2d25	S7	0	3 each 4.3 GB
	rz2e24	S8	0	3 each 4.3 GB
	rz2e25	S9	0	3 each 4.3 GB
	rz2e26	S10	0	3 each 4.3 GB
	rz2e27	S11	0	3 each 4.3 GB
	rz2d27	S12	0	3 each 4.3 GB
SCSI2	rz34		0	4.3 GB
SCSI3	rz40	S1	0	3 each 4.3 GB
	rz41	S2	0	3 each 4.3 GB
	rz42	S3	0	3 each 4.3 GB
	rz43	S4	0	3 each 4.3 GB
	rz2b41	S5	0	3 each 4.3 GB
	rz2b42	S6	0	3 each 4.3 GB
	rz2b43	S7	0	3 each 4.3 GB

Detailed Hardware Configuration

SCSI Bus	Logical Unit (LUN)	Stripeset	RAID Level	Member Drives
	rzc41	S8	0	3 each 4.3 GB
	rzb40	S9	0	3 each 4.3 GB
	rzc40	S10	0	3 each 4.3 GB
	rzc42	S11	0	3 each 4.3 GB
	rzc43	S12	0	3 each 4.3 GB