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PATHWORKS
OpenVMS AlphaServer 4x00

DIGITAL HiTest Notes

EK-HPWVA-HN. B01

March 1997

Revision/Update Information: This is a revised manual Version 1.1.

Operating System and Version: OpenVMS V6.2-1H3

Digital Equipment Corporation
Maynard, Massachusetts

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Preface

This document provides an overview of HiTest Systems and detailed technical information about interoperability test results for an OpenVMS PATHWORKS Server AlphaServer 4000/4100 running the OpenVMS V6.2-1H3 operating system. This system can be used as a standalone system or in an OpenVMS cluster environment.

Audience

Primary users of this document are DIGITAL and Partners sales representatives, technical support personnel, and DIGITAL customers (when configuring and upgrading systems and working configuration problems); product managers (for extracting data needed by sales tools); personnel responsible for installing, setting up, and operating a HiTest System.

Road Map

This document contains the following sections:

1. Introduction — Provides a brief summary of the benefits of HiTest Templates and an overview of the Template covered in this document.

2. Configuration Data — Gives tables of configuration data about the hardware and software components that define the Template, and special configuration rules if any.

3. HiTest System Installation and Setup — Presents information useful when installing and tuning a HiTest System configured from this HiTest Template.

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 performance 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 a more detailed treatment of the hardware and software components listed in the Configuration Data section.

Feedback and Ordering Information

What our readers think of this or any other DIGITAL documentation is important to us. If you have any comments, no matter how great or small, we'd appreciate hearing from you. Send your comments to: *reader-comments@digital.com*.

Please reference the document title and part number in your correspondence about this manual.

Copies of this and other DIGITAL documents can be ordered by calling 1-800-DIGITAL.

1

Introduction

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 PATHWORKS.

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 AppSet includes the software specific to one class of customer solutions.

Configuring a DIGITAL HiTest Suite is easy. Simply 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.

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 section 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 section 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 (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 base 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 OpenVMS PATHWORKS Server AlphaServer 4000/4100 Series HiTest Suite meets the requirements of OpenVMS PATHWORKS servers for medium to high-end workgroups. This Suite covers the full product line of mid-range AlphaServer 4000/4100 systems running OpenVMS PATHWORKS.

2
Configuration Data

Configuration data includes the hardware, software, and firmware components that were tested together. Special configuration rules are explained if required.

Hardware and Software Components

The following table identifies the range of hardware and software components that can be configured using the OpenVMS PATHWORKS Server AlphaServer 4000/4100 HiTest Template. This range includes both the AlphaServer 4000 and the AlphaServer 4100 system and up to two CPUs, and 512 MB to 1.5 GB of memory.

A wide selection of other options such as storage and network adapters can be configured.

Storage requirements can be met by choosing one or more of the following storage options:

Option 1   For small RAID configurations (seven disks or less): These disks are accessed locally and available to the rest of the cluster by MSCP disk serving.

Option 2   For larger RAID configurations (up to 24 disks): These disks are accessed locally and are available to the rest of the cluster via MSCP disk serving. The disks may be configured with a mix of RAID, Stripe, and standard disks.

This option consists of up to two HSZ50 controllers that may be set upin a redundant configuration to support up to 24 disk drives in a StorageWorks cabinet. This option is connected to the system by a BN21K-02 SCSI cable which is connected to a KZPSA-SCSI/PCI adapter in the system.

Option 3   For larger RAID with CI configurations (up to 24 disks): These disks are available cluster-wide via CI interface. The disks may be configured with a mix of RAID, Stripe, and standard disks.

The option consists of up to two HSJ50 controllers that may be set up as a redundant configuration to support up to 24 disk drives in a StorageWorks cabinet. This option is connected to the star coupler by four BNCIA cables.

_____ **Note** _____

This option requires the use of a CIPCA in the 4x00 system. See the CI option.

_____

CI Option   This option allows the HiTest system to be added to a CI Cluster and consists of a CIPCA-AA PCI to CI adapter and four BNCIA CI cables to connect the HiTest system to the CI cluster.

Table 2-1: OpenVMS PATHWORKS Server AlphaServer 4000/4100 HiTest Template

<table>
<tr><td colspan="6" align="center">PATHWORKS OpenVMS HiTest Appset
DIGITAL AlphaServer 4000/4100 HiTest Foundation</td></tr>
<tr><td colspan="6">For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.DIGITAL.com:9003
For hardcopy of this Suite's HiTest Notes, order EK-HPWVA-HN.</td></tr>
<tr><td>Line Item</td><td>Description</td><td>Part Number</td><td colspan="2">Tested Range</td></tr>
<tr><td></td><td></td><td></td><td>Min</td><td>Max</td></tr>
<tr><td colspan="5" align="center">Appset Software</td></tr>
<tr><td>1</td><td>DIGITAL PATHWORKS V5.0E for OpenVMS</td><td></td><td>0</td><td>1</td></tr>
<tr><td colspan="5" align="center">Foundation Hardware</td></tr>
<tr><td>2</td><td>Select just one base system:
AS4100 5/400 Drawer OpenVMS 512 MB
AS4100 5/400 Drawer OpenVMS 1 GB
AS4000 5/400 Drawer OpenVMS 512 MB
AS4000 5/400 Drawer OpenVMS 1 GB

Hardware includes:
• 5/400-MHz CPU with 1.5-MB cache
• Memory
• 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

Software includes: (See below for details)
• OpenVMS
• EIP</td><td>DY-51HAB-EB
DY-51HAB-FB
DY-52HAB-EB
DY-52HAB-FB</td><td>1</td><td>1</td></tr>
<tr><td>3</td><td>Cabinet Enclosure
Hardware includes:
• 4.3 GB Wide Disk (RZ29B-VW)
• 19-in cabinet with StorageWorks Shelf and mounting kit. Cabinet supports up to seven more StorageWorks shelves.</td><td>H9A10-ED</td><td>1</td><td>1</td></tr>
<tr><td>4</td><td>400 Mhz CPU DIGITAL OVMS SMP UPG</td><td>KN304-BA</td><td>0</td><td>1</td></tr>
<tr><td>5</td><td>Select one Memory option.
128 MB Memory Option
512 MB Memory Option
The largest memory option should go in Slot 0.</td><td>MS320-CA
MS330-EA</td><td>0</td><td>1</td></tr>
<tr><td>6</td><td>Required for any of the following two items
StorageWorks Shelf</td><td>BA36R-SB</td><td>1</td><td>1</td></tr>
<tr><td>7</td><td>4.3 GB 7200 RPM 16-bit Wide SCSI Disks</td><td>RZ29B-VW</td><td>3</td><td>4</td></tr>
<tr><td>8</td><td>Select one tape option:
32/96 GB 4mm 1.5GB/hr 5.25-inch SCSI tape loader
8 GB 4mm DAT 93 MB/min (compressed) 5.25-inch SCSI tape drive</td><td>TLZ7L-VA

TLZ9L-VA</td><td>0</td><td>1</td></tr>
<tr><td>9</td><td>PCI to FDDI Adapter</td><td>DEFPA-AB</td><td>1</td><td>1</td></tr>
<tr><td>10</td><td>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, 0.30 mm</td><td>VRC15-WA
VRT17-WA
VRC21-WA</td><td>1</td><td>1</td></tr>
</table>

Configuration Data

Line Item	Description	Part Number	Tested Range	
			Min	Max
PATHWORKS OpenVMS *HiTest Appset*   **DIGITAL AlphaServer 4000/4100 *HiTest Foundation***
For documentation and updates: http://cosmo.tay.dec.com *and* http://www.partner.DIGITAL.com:9003   *For hardcopy of this Suite's HiTest Notes, order* EK-HPWVA-HN.
Storage Options   *Elect any combination of the following three storage options*   *Within each elected option, order at least one of each of the listed components.*
Storage Option 1 - Internal RAID (scales to 21 disks)
11	**PCI Backplane RAID 3 Channel Controller** **For small configurations**	**KZPSC-BA**	0	1
12	**Battery Backup for KZPSC**	**KZPSC-UB**	0	1
13	**16 MB Cache for KZPSC**	**MS100-AA**	0	1
14	*Order one for each active port.* **RAID Cables**	**BN31S-1E**	0	1
15	**4.3 GB 7200 RPM 16-bit Wide SCSI Disks**	**RZ29B-VW**	0	4
16	**StorageWorks Shelf**	**BA36R-SB**	0	1
Storage Option 2 - External Storage (local connected)
17	**StorageWorks RAID Array 450/HSZ50 64 MB SCSI controller**	**HSZ50-AH**	0	2
18	**HSZ50 License/Media/Documentation Kit**	**QB-5CJAA-AA**	1	1
19	**SCSI cable**	**BN31G-0E**	0	1
20	**PCI one-port FWD SCSI controller**	**KZPSA-BB**	0	1
21	**2 meter 16-bit SCSI cable (external)**	**BN21K-05**	0	1
22	**4.3 GB 7200 RPM 16-bit Wide SCSI Disks**	**RZ29B-VW**	0	24
23	**StorageWorks Departmental Cabinet**	**SW300-AA**	0	1
Storage Option 3 External Storage (cluster accessible)   *Requires the use of CI option in line items 10-22.*
24	**CI Array Controller 128 MB Cache**	**HSJ50-AJ**	0	2
25	**HSJ50 License/Media/Documentation Kit**	**QB-SC4AA-AA**	1	1
26	*Consult DIGITAL Technical Support for the correct cable length and corresponding part number for customer site.* **CI Cables conforming to customer needs**	**BNCIA-20**	0	4
27	**4.3 GB 7200 RPM 16-bit Wide SCSI Disks**	**RZ29B-VW**	0	24
28	**StorageWorks Departmental Cabinet**	**SW300-AA**	0	1
CI Option Cluster Connection
29	**PCI to CI Adapter**	**CIPCA-AA**	0	2
30	**CI Cables conforming to customer needs**	**BNCIA-20**	0	4
Foundation Software
Note: *Order the exact versions and revisions of the software shown below.*   *Paper documentation can be ordered separately.*
--	**DIGITAL OpenVMS V6.2-1H3**		Included with item 1.
31	**DIGITAL DECnet Plus V6.3 ECO5**	*	1	1

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*Consult your DIGITAL sales representative for specific part numbers and licenses.

<table>
<tr><td colspan="5">PATHWORKS OpenVMS <i>HiTest Appset</i>
DIGITAL AlphaServer 4000/4100 <i>HiTest Foundation</i></td></tr>
<tr><td colspan="5"><i>For documentation and updates:</i> http://cosmo.tay.dec.com <i>and</i> http://www.partner.DIGITAL.com:9003
<i>For hardcopy of this Suite's HiTest Notes, order</i> EK-HPWVA-HN.</td></tr>
</table>

Line Item	Description	Part Number	Tested Range Min	Tested Range Max
32	**DIGITAL TCP/IP Services for OpenVMS Alpha V4.1A-12**	*	1	1
33	**TIMA Kit ALPLAN04_062**		1	1
34	**OpenVMS Alpha Software Layered Products and Operating System Library (CD-ROM)** *Note: Binaries only. No documentation.*	**QA-5FX8A-H8**		
35	**OpenVMS Alpha OnLine Documentation Library (CD-ROM)** *Note: Documentation only.*	**QA-4KM8A-G8**		
36	**OpenVMS Alpha Software Layered Products and Operating System Library Package (CD-ROM)** *Note: Binaries and documentation.*	**QA-5G9AA-H8**		
37	*Consult with your DIGITAL Sales Representative for product specific printed documentation set part numbers.* **Printed Documentation**			

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

The following table lists the revision levels for the hardware and software components that were tested.

Table 2-2: Component Firmware Revision Levels

Hardware Component	Hardware Revision	Firmware Revision	Software Revision
SRM Console	n/a	3.0-10	n/a
4.3 GB disk (RZ29B-VW)	n/a	0014	n/a
Tape Drive TLZ7L-VA	B05	n/a	n/a
Tape Drive TLZ09-VA	A01	n/a	n/a
DECchip 21040-AA	A03/2.4	n/a	n/a
PALcode	n/a	n/a	V1.19-2
AlphaBIOS	n/a	5.24-0	n/a
KZPAA	C	n/a	n/a
KZPSC	D01	2.36	n/a
KZPSA	A09	A10	n/a
DEFPA	A01	2.46	n/a
CIPCA	D	3.15	n/a
HSZ50-AH	A01	V50Z-1	n/a
HSJ50-AJ	B01	V50J-1	n/a
Graphics board (S3)	-2	n/a	n/a

Special Configuration Rules

HSZ50

The HSZ50 was configured for dual redundancy (2 HSZ50-AH's in a SW300-AA cabinet) with 24 RZ29B-VW disk drives. The storage cabinet was connected to the HiTest system by a BN21K-02 SCSI cable to the KSPSA-BB SCSI adapter.

HSJ50

The HSJ50 was configured for dual redundancy (2 HSJ50-AJ's in a SW300-AA cabinet) with 24 RZ29B-VW disk drives. The storage cabinet was available to the cluster by BNCIA-20 cables. The system utilized a CIPCA-AA CI adapter connected to the cluster by BNCIA-20 cables.

RAID 3 Channel Controller

The RAID controller (KZPSC-BA) was configured with 3 RZ29B-VW's as a RAIDset and 1 RZ29B-VW configured as a HOT spare. All disks were in a BA356 storage shelf connected by a BN31S-1E SCSI cable.

Clusters with CI Interconnects

The CI node number will need to be set so that it does not conflict with the other CI cluster members. This is set on the CIPCA adapter. Please refer to the *CIPCA Adapter Installation and User's Guide* (order number EK-CIPCA-UG) for setting the Node ID.

Storage Shelves

When configuring larger HiTest Systems, the BA356 storage shelves are configured as a single bus.

For details on configuring a BA356 shelf, refer to the *StorageWorks BA356-SB 16-Bit Shelf User's Guide* (order number EK-BA356-UG).

Memory Modules

A memory option consists of two memory modules where each module is of the same size and type. Memory modules are used only in pairs (a memory option). Each module in the option provides either the low half or the high half of that pair's memory region. Two types of memory modules are available: synchronous and extended data out (EDO).

Configuration Rules

- Memory modules must be installed and used in pairs. Both modules in a memory pair must be of the same size and type.

- Memory must be configured in descending order, that is, the largest memory pair must be in slot 0 Low and slot 0 High, the second largest pair in 1 Low and 1 High, and so on.

The *AlphaServer System Drawer User's Guide* (order number EK-4100A-UG) provides more details. The guide gives the detailed configuration information needed to properly install CPU and memory options, as well as PCI options.

3
HiTest System Installation and Setup

The following information provides guidelines for system installation and setup.

Preparation

Installed Base Cluster Considerations

Any existing VAX cluster nodes need to be upgraded with the following products and their relevant licenses, with the inclusion of the VAXcluster and the SHADOWING licenses:

- OpenVMS V6.2
- TIMA Kit VAXSYS01_062.A
- DECnet Plus V6.3 #ECO5
- DIGITAL TCP/IP Services for OpenVMS VAX V4.1-12
- PATHWORKS V5.0E (LAN Manager) for OpenVMS
- Configure ODS shares

Common Issues

Systems configured from this Template require network addresses and a Cluster ID relevant to the site environment. Consult your Network Administrator.

In an NI cluster configuration, the removal of a quorum disk is suggested in order to increase the performance of the PATHWORKS server.

Procedure

Perform the following software installations:

Install the following products with their relevant licenses with the inclusion of the VAXCLUSTER and the SHADOWING licenses on the AlphaServer system.

- OpenVMS V6.2-1H3
- TIMA Kit ALPLAN04_062
- DECnetPlus V6.3 #ECO5
- DIGITAL TCP/IP Services for OpenVMS AXP V4.1-12
- PATHWORKS V5.0E (LAN Manager) for OpenVMS
- Configure ODS shares

_____ Note _____

It is recommended that all the DE500-AA ethernet adapters be set to "fast"mode, if possible. This is more beneficial in an NI cluster where a CI is not available to offload the network adapter(s).
_____

_____ Note _____

Install and start DECnet Plus and DIGITAL TCP/IP Services before installing PATHWORKS. The PATHWORKS Configurator picks up the network information automatically if the network is available.
_____

- PATHWORKS V5.0E (LAN Manager) for OpenVMS

4

Interoperability Tests and Results

The systems were tested in an established clustered environment and connected via an NI or NICI interface or both. Although these systems can be run independently, the testing was performed in a cluster environment. The cluster consisted of several VAX systems with the interconnect set to NICI in the MODPARAMS.DAT file. The system disk was a two-volume shadow set on a DSSI interface with paging and swapping files on another allocated disk.

Test Tools

Cluster Test Manager (CTM) Test Suite

The CTM Test Suite is a collection of system-level test tools used to test the system prior to installing applications. This test suite was used to verify basic system functionality prior to the execution of the PATHWORKS Test Suite. Specifically, these tools were used to verify I/O, network, and cluster interconnect functionality.

PATHWORKS Test Suite

This suite was used to verify client/server functionality. These tests ensure interoperability between a Windows 95 or Windows NT client, and LAN Manager compliant servers.

This suite consists of over 400 functional tests. These tests performed operations on several different types of files including text, executable, and various sequential and indexed file types. The file sizes ranged from 1 to 10 MB. This suite was also used as a server stress test by running it from multiple clients against a single server.

Test Configuration

Minimum Configuration

For testing the minimum configuration, the data was set up as follows.

Table 4-1: Disk Setup for the Minimum Configuration

Quantity	Capacity (GB)	Disk Content/Data	Disk Controller
1	4.3	System disk paging and swapping disk	KZPDA-AA[†]
1	4.3	PATHWORKS ODS shares	KZPDA-AA†
1	4.3	Spare	KZPDA-AA†
3	4.3	RAID 3 drive set (PATHWORKS ODS share)	KZPSC-BA
1	4.3	Hot swap for RAID 3 drive set	KZPSC-BA

Maximum Configuration

For testing the maximum configuration, the data was set up as follows.

Table 4-2: Disk Setup for the Maximum Configuration

Quantity	Capacity (GB)	Disk Content/Data	Disk Controller
2	4.3	System disk (shadowed)	KZPDA-AA†
3	4.3	Spare drive	KZPDA-AA†
3	4.3	RAID 5 set on HSZ50-AH (PATHWORKS ODS shares)	KZPSA-BB
4	4.3	RAID 5 set on HSZ50-AH (PATHWORKS ODS shares)	KZPSA-BB
6	4.3	RAID 5 set on HSZ50-AH (PATHWORKS ODS shares)	KZPSA-BB
6	4.3	Stripe set on HSZ50-AH (PATHWORKS ODS shares)	KZPSA-BB
2	4.3	Spare set on HSZ50-AH for RAIDsets	KZPSA-BB
3	4.3	Unused on HSZ50-AH	KZPSA-BB
1	4.3	Paging and swapping disk	HSJ50-AJ
2	4.3	PATHWORKS server (shadowed)	HSJ50-AJ
1	4.3	PATHWORKS ODS shares	HSJ50-AJ
1	4.3	PATHWORKS ODS shares (shadowed)	HSJ50-AJ
1	4.3	System common files (SYSUAF, Rightslist, others)	HSJ50-AJ
17	4.3	Spares	HSJ50-AJ

[†]Test was with KZPAA-AA in lieu of KZPDA-AA due to availability.

Test Process

The CTM Test Suite was installed and the system checkout tests were run. Following successful execution, the PATHWORKS Test Suite was started on the PCs accessing the PATHWORKS server.

While the tests were executing, the following functions where performed:

Backup

Backups where performed on PATHWORKS ODS shares using DCL Procedures, that were queued to coincide with the tests that ran from the PCs.

Failing RAID Disk Drive

- An RZ29 drive was pulled from the RAIDset attached to the RAID controller (KZPSC) to simulate a failing disk drive.

- An RZ29 drive was pulled from the RAIDset attached to the HSZ50 to simulate a failing disk drive.

Failing HSZ50 Controllers

One of the HSZ50-AH's controllers was removed to simulate a failing controller.

Failing HSJ50 Controllers

One of the HSJ50-AJ's controllers was removed to simulate a failing controller.

CI Port Failure

A CI cable was removed from Transmit A Port to initiate CI port failure.

Network Recovery

A network cable connected to the DEFPA (FDDI) was removed temporarily to check for network failure.

Test Results

The system performed without problems with the following execptions which do not interfere with system performance.

Test: Failing Disk Drive

- RAIDset attached to the RAID controller (KZPSC) continued without errors, a hot spare drive automatically replaced the failed drive.

- RAIDset attached to the (HSZ50) continued without errors.

Test: Failing HSZ50 Controllers

Testing continued with out errors - the redundant controller assumed all the I/O.

Test: Failing HSJ50 Controllers

The redundant controller assumed all the I/O.

Testing continued without errors.

Test: CI Port Failure

The system correctly reconnected to an adjacent CI port.

Test: Network Recovery

When the network cable was reconnected, the test continued without errors. All network traffic was routed through the DE500 adapter.

5
System Limits and Characterization Data

PATHWORKS

ODS shares are recommended for optimum PATHWORKS share performance.

6
Problems and Resolutions

There were no problems.

A
Detailed Hardware Configuration

This appendix describes the minimum and maximum hardware configuration as tested for the following:
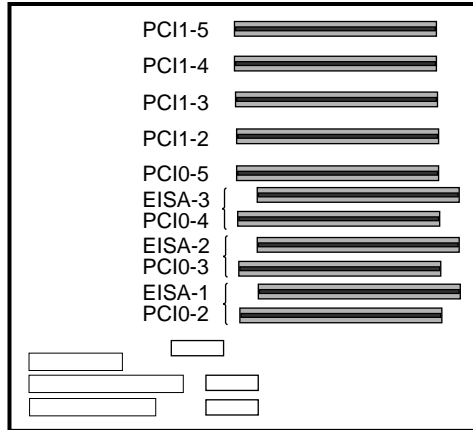
- PCI Motherboard

- System Motherboard

- BA356 Storage Shelves

PCI Motherboard

The following information describes the minimum and maximum hardware configuration for the PCI motherboard.

Compare the slots in the illustration below to the slots listed in the following tables.

Figure A-1: PCI Motherboard

ML013980

Table A-1: Minimum Maximum Configuration for PCI Motherboard

Slots	Minimum Configuration Options	Maximum Configuration Options	Description
PCI1-5	open	open	
PCI1-4	KZPSC-BA	KZPSA-BB	PCI RAID controller
PCI1-3	KZPAA-AA	KZPAA-AA	PCI to SCSI adapter
PCI1-2	DE500-AA	DE500-AA	Ethernet adapter
PCI0-5	open	CIPCA-AA	PCI to CI Host Bus Adapter (port)
EISA-3/ PCI0-4	open	CIPCA-AA	PCI to CI Host Bus Adapter (link)
EISA-2/ PCI0-3	DEFPA-AB	DEFPA-AB	PCI to FDDI
EISA-1/ PCI0-2	PB2GA-JB	PB2GA-JB	PCI-based S3 Trio Video Card

System Motherboard

The following information describes the minimum and maximum hardware configuration for the AlphaServer 4100 system motherboard. The configuration is similar for the AlphaServer 4000.

Compare the slots in the illustration below to the slots listed in the following tables.
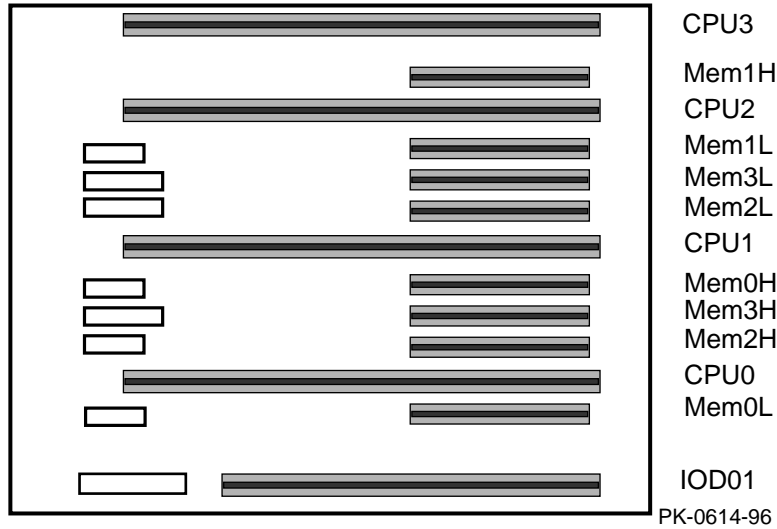
Figure A-2: System Motherboard


```
                                            CPU3

                                            Mem1H
                                            CPU2
                                            Mem1L
                                            Mem3L
                                            Mem2L
                                            CPU1

                                            Mem0H
                                            Mem3H
                                            Mem2H
                                            CPU0
                                            Mem0L

                                            IOD01
                                            PK-0614-96
```

Table A-2: System Motherboard Minimum and Maximum DIGITAL HiTest Configuration

Slot	Minimum Configuration Options	Maximum Configuration Options	Description
CPU3‡	open	open	
Mem1H	open	MS330-EA	board 2 of 2
CPU2‡	open	open	
Mem1L	open	MS330-EA	board 1 of 2
Mem3L‡	open	open	
Mem2L‡	open	open	
CPU1	open	KN304-BB	400 MHz CPU 2 MB cache
Mem0H	MS330-EA	MS330-FA	board 2 of 2
Mem3H‡	open	open	
Mem2H‡	open	open	
CPU0	KN304-BB	KN304-BB	400 MHz CPU 2 MB cache
Mem0L	MS330-EA	MS330-FA	Memory pair 0 (1 of 2)
IOD01			

---

‡ These slots do not exist on the AlphaServer 4000 system.

Figure A-3: SW300-AA Cabinet with Disks and Controllers

2 HSJs
OR
2 HSZs
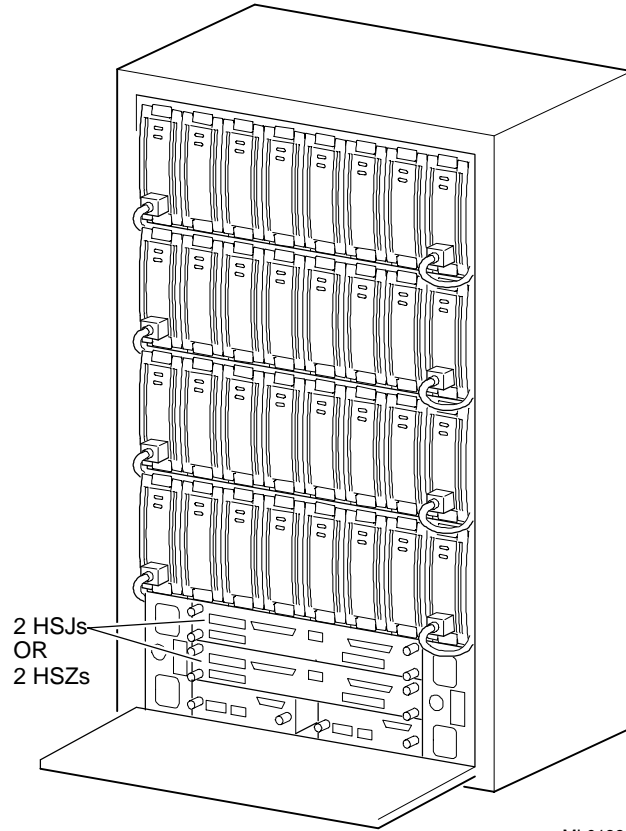
ML013997

BA356 Storage Shelves

Figure A-4: BA356 Storage Shelves
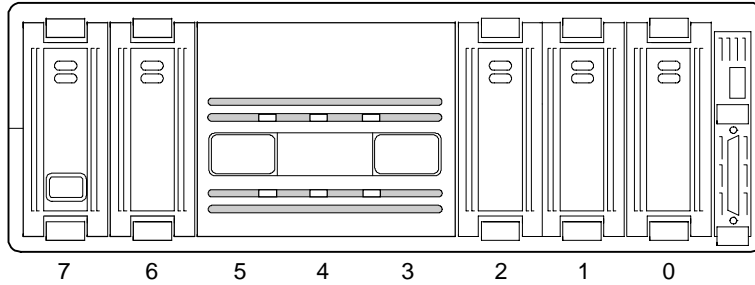
ML013996

Table A-3: Minimum Configuration

Shelf 1 - Connected to KZPAA-AA

Slot Number							
7	6	5	4	3	2	1	0
Power supply	Unused slot	32/96 GB 4 mm 1.5 GB/hr 5.25-inch SCSI tape loader			Spare disk	PATHWORKS ODS share	System Disk and Page, Swap

Shelf 2 - Connect to KZPSC-BA

Slot Number							
7	6	5	4	3	2	1	0
Power supply	Unused slot	Unused slot	Unused slot	Hot Spare for RAIDset	RAIDSet and PATHWORKS ODS share	RAIDset and PATHWORKS ODS share	RAIDset and PATHWORKS ODS share

Table A-4: Maximum Configuration

Shelf 1 - Connected to KZPAA-AA

Slot Number							
7	6	5	4	3	2	1	0
Power supply	8 GB 4 mm DAT 93 MB/min (compressed) 5.25-inch SCSI tape drive			PATHWORKS disk and common ODS share	Page, swap and PATHWORKS ODS share	System disk and volume shadow	System disk and volume shadow

Table A-5: HSZ50 RZ29B Disk Configuration

Slot Number							
7	6	5	4	3	2	1	0
Power supply	RZ29B-VW	RZ29B-VW	RZ29B-VW	RZ29B-VW	RZ29B-VW	RZ29B-VW	Power supply
Power supply	Spare disk	Spare disk	RAIDset 3 Pathworks ODS shares	RAIDset 3 Pathworks ODS shares	RAIDset 3 Pathworks ODS shares	Spare disk	Power supply
Power supply	RAIDset 2 Pathworks ODS shares	RAIDset 2 Pathworks ODS shares	RAIDset 2 Pathworks ODS shares	RAIDset 2 Pathworks ODS shares	Hot Spare	Hot Spare	Power supply
Power supply	RAIDset 1 Pathworks ODS shares	RAIDset 1 Pathworks ODS shares	RAIDset 1 Pathworks ODS shares	RAIDset 1 Pathworks ODS shares	RAIDset 1 Pathworks ODS shares	RAIDset 2 Pathworks ODS shares	Power supply
Power supply	Stripe Set 1 Pathworks ODS shares	Stripe Set 1 Pathworks ODS shares	Stripe Set 1 Pathworks ODS shares	Stripe Set 1 Pathworks ODS shares	Stripe Set 1 Pathworks ODS shares	Stripe Set 1 Pathworks ODS shares	Power supply
HSZ50-AH (Controller)							
HSZ50-AH (Controller)							

Table A-6: HSJ50 RZ29B Disk Configuration

Slot Number							
7	6	5	4	3	2	1	0
Power supply	RZ29B-VW	RZ29B-VW	RZ29B-VW	RZ29B-VW	RZ29B-VW	RZ29B-VW	Power supply
Power supply	Pathworks ODS shares	Spare disk	Spare disk	Spare disk	Spare disk	Pathworks Files And ODS shares (Shadowed)	Power supply
Power supply	Pathworks ODS shares	Spare disk	Spare disk	Spare disk	Spare disk	Pathworks Files And ODS shares (Shadowed)	Power supply
Power supply	Spare disk	Spare disk	Spare disk	Spare disk	Spare disk	System Files i.e. Sysuaf Rightslist	Power supply
Power supply	Stripe Set ODS shares	Stripe Set ODS shares	Stripe Set ODS shares	Stripe Set ODS shares	Stripe Set ODS shares	Strip Set ODS shares	Power supply
HSJ50-AJ (Controller)							
HSJ50-AJ (Controller)							