d i g i t a l

MS Internet Information Server
Windows NT 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 Microsoft Internet Information Server (IIS) Windows NT 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 – Gives 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 performance data that were identified during testing.

6. Problems and Resolutions – Discusses any problems and solutions 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.

Feedback and Ordering Information

What our readers think of this or any other DIGITAL documentation is important to us. If you have any comments, we would appreciate hearing from you. Send your comments to: *reader-comments@digital.com*.

Please reference the document title and part number (EK-HISNA-HN. C01) 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 medium capacity to high-end MS Internet Information Server users.

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.

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-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 MS Internet Information Server Windows NT AlphaServer 4x00 HiTest Suite consists of the following software components:

- Windows NT Server

- MS Internet Information Server (IIS)

This Suite will meet the server needs of medium capacity to high-end MS Internet Information Server users. This Template covers a range from small AlphaServer 4000 systems to large AlphaServer 4100 systems.

Microsoft IIS is tightly integrated with the Microsoft Windows NT operating system and is designed to deliver a wide range of internet and intranet capabilities.

Expanding the affordable power of the midrange family, the AlphaServer 4000/4100 systems feature 400 MHz of processing power and 4 MB onboard cache. These robust servers support today's fastest ALPHA processors, and are well positioned to exploit processor improvements that will follow over time.

2
Configuration Data

This chapter describes the tested DIGITAL HiTest Configuration Suite, and includes 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 MS Internet Information Server Windows NT AlphaServer 4x00 HiTest Suite.

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

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 medium- to high-end MS Internet Information Server users.

- **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.

Configuration Data

Table 2-1: Windows NT AlphaServer 4x00 HiTest Template

<table>
<tr><td colspan="6" align="center">Internet MS IIS HiTest AppSet
NT AlphaServer 4000/4100 HiTest Foundation</td></tr>
<tr><td colspan="6" align="center">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-HISNA-HN</td></tr>
<tr><td rowspan="2">Line Item</td><td rowspan="2" align="center">Description</td><td rowspan="2">Part Number</td><td colspan="2">HiTest Range</td></tr>
<tr><td>Min</td><td>Max</td></tr>
<tr><td colspan="6" align="center">AppSet Software</td></tr>
<tr><td>1</td><td>MS Internet Information Server (IIS) V3.0
Contact Microsoft at <code>http://www.microsoft.com</code></td><td>Included with item 14</td><td>1</td><td>1</td></tr>
<tr><td colspan="6" align="center">Foundation Hardware</td></tr>
<tr><td>2</td><td>Select one base system:
AlphaServer 4100 5/466, Windows NT, 512 MB
AlphaServer 4100 5/466, Windows NT, 1 GB
AlphaServer 4100 5/466, Windows NT, 2 GB
AlphaServer 4000 5/466, Windows NT, 512 MB
AlphaServer 4000 5/466, Windows NT, 1 GB
AlphaServer 4000 5/466, Windows NT, 2 GB

Hardware includes:
• 5/466 MHz CPU with 4 MB cache
• PB2GA-JB TRIO64 1 MB Graphics
• DE500-AA 10/100 Mbit Fast Ethernet
• KZPDA-AA FW SCSI and cable
• SCSI CD-ROM drive
• RX23L-AB 1.44 MB Floppy drive
• LK47W-A2 PS/2 style keyboard
• Three-button PS/2 compatible mouse

Software includes:
• Windows NT Server operating system with 10-client access license and media</td><td>DN-51JAA-EB
DN-51JAA-FB
DN-51JAA-GB
DN-53JEA-EA
DN-53JEA-FA
DN-53JEA-GA</td><td>1</td><td>1</td></tr>
<tr><td>3</td><td>Pedestal with StorageWorks shelf

Hardware includes:
• 4.3 GB 7200 RPM UltraSCSI Disk (RZ1CB-VW)
• Pedestal with one StorageWorks shelf and mounting kit</td><td>BA30P-AB</td><td>1</td><td>1</td></tr>
<tr><td>4</td><td>466 MHz CPU Windows NT SMP UPG</td><td>KN304-DD</td><td>0</td><td>1</td></tr>
<tr><td>5</td><td>512 MB Memory Option
1 GB Memory Option
Note: This HiTest template supports a memory range of 512 MB to 2GB. When selecting memory stay within the range.</td><td>MS330-EA
MS330-FA</td><td>0</td><td>See note</td></tr>
<tr><td>6</td><td>PCI three-port RAID Controller</td><td>KZPAC-CA</td><td>0</td><td>1</td></tr>
<tr><td>7</td><td>SCSI-2 cable, external 1.5-meter 16-bit (90°)</td><td>BN31S-1E</td><td>0</td><td>2</td></tr>
<tr><td>8</td><td>Shelf expansion unit, 7 device, 16 bit SCSI</td><td>BA36R-SB</td><td>0</td><td>2</td></tr>
<tr><td>9</td><td>Active SCSI-2 terminator, 16 bits</td><td>BA35X-ME</td><td>0</td><td>2</td></tr>
<tr><td>10</td><td>4.3 GB 7200 RPM UltraSCSI Disks
Note: When UltraSCSI drives are used in a BA356-series StorageWorks Shelf, ensure that the shelf contains a 180W power supply (DS-BA35X-HH).</td><td>DS-RZ1CB-VW</td><td>2</td><td>9</td></tr>
<tr><td>11</td><td>4/8 GB DAT Tape Drive</td><td>TLZ09-VA</td><td>1</td><td>1</td></tr>
<tr><td>12</td><td>PCI 10/100-Mbit Fast Ethernet controller</td><td>DE500-AA</td><td>0</td><td>1</td></tr>
</table>

Internet MS IIS *HiTest AppSet* NT 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-HISNA-HN				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
13	*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	1
	Foundation Software			
14	**Windows NT Server 4.0**	**Microsoft**	1	1
15	**Windows NT Service Pack 3** To access service packs, connect to: `ftp://ftp.microsoft.com/bussys/winnt`	**Microsoft**	1	1
16	**System Management Server (SMS) V1.2 Agent**	**Microsoft**	0	1
17	**System Management Station**	**See Table 2-2**	0	1

Table 2-2: System Management Station Template

Internet MS IIS *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 systems management station. When the system management option is included, this HiTest Template identifies the items required. When system management is to be provided through other means, this system management station option may be omitted without invalidating the HiTest Suite.				
1	**Prioris XL 6200 Server** *Hardware includes:* • 200 MHz CPU, 256 KB cache • Integrated Fast Ethernet • 12X CD-ROM • 2.1 GB wide SCSI disk drive • 1.44 MB diskette drive • 32 MB 60 ns EDO DIMM memory *Software includes:* • ServerWORKS **Note:** Customers that want to run Windows NT Server 4.0 must purchase Windows NT separately from a Microsoft authorized distributor. The substitution of any equivalently configured Intel-based PC does not invalidate this HiTest configuration.	**FR-B60WW-XD**	1	1
2	**Country Kit** *Select country-specific kit which includes keyboard.* **Note:** Orders that are not North American should substitute the appropriate country kit.	**FR-PC94K-AA**	1	1
3	**32 MB 60 ns EDO DIMM Memory**	**FR-PCSMA-AC**	1	1
4	*Select one high-resolution color monitor (the 17" is recommended):* **15" flat-square 0.28 dot pitch** **17" flat-square 0.28 dot pitch**	**FR-PCXBV-YW** **FR-PCXBV-ZW**	1	1

| Internet MS IIS *HiTest AppSet* | | | | |
| System Management Station | | | | |
Line Item	Description	Part Number	HiTest Range Min	Max
System Management Station Software				
5	**Windows NT Server V4.0** Contact Microsoft at `http://www.microsoft.com`	**Microsoft**	1	1
6	**Windows NT Service Pack 3 (SP3)** To access service packs, connect to: `ftp://ftp.microsoft.com/bussys/winnt`	**Microsoft**	1	1
7	**System Management Server (SMS) V1.2** Contact Microsoft at `http://www.microsoft.com`	**Microsoft**	1	1
8	**SQL Server V6.5** Contact Microsoft at `http://www.microsoft.com`	**Microsoft**	1	1

Table 2-3: Component Revision Levels

Hardware Component	Hardware	Firmware	Software
5/466 MHz CPU	A02	–	–
SCSI Disk Controller (KZPDA-AA)	A01	2	–
SCSI RAID Controller (KZPAC-CA)	E02	2.42 BIOS	–
4.3 GB Disk	A01	LYJ0	–
Ethernet Controller	B01	32	–
SRM Console	–	4.9-1	–
AlphaBIOS	–	5.32	–
Software Component	**Version/ Revision**	**Patch Level**	
Windows NT Server	4.0	Windows NT Service Pack 3 (SP3)	
Internet Information Server	3.0	IIS Service Pack 1 (SP1)	
System Management Server	1.2	SMS Service Pack 1 (SP1)	
EISA Configuration Utility (ECU)	1.9	–	
RAID Configuration Utility (RCU)	4.73	–	
RAID Management Utility for NT	1.26	–	

Special Configuration Rules

The *AlphaServer System Drawer User's Guide* (part number EK-4100A-UG) and the *AlphaServer 4000/4100 Configuration and Installation Guide* (part number EK-4100A-CG) provide detailed configuration information needed to properly install CPU, memory, and PCI options.

_____ **Note**_____

When configuring the maximum DIGITAL HiTest Template, the BA356 storage shelves are configured in split-bus mode (two SCSI buses). This requires installation of an active terminator (BA35X-ME) in the BA356 shelf.

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For details on configuring a BA356 shelf with two SCSI buses, refer to the *StorageWorks Solutions 7 Device, 16-Bit SBB Shelf (BA356-S Series) User's Guide* (part number EK-BA356-UG).

It is possible to order more memory options than are supported by the DIGITAL HiTest Templates. To comply with the HiTest Template, keep the total installed in each system drawer to 2 GB or less.

_____ **Note**_____

When you upgrade IIS 2.0 to 3.0, make sure that you reinstall any Windows NT Service Packs. Specifically, make sure that Service Pack 3 is reinstalled after installing Active Server Pages for IIS 3.0.

_____

3
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.

Hardware Installation

The hardware was installed and interconnected as shown in Appendix A.

System Firmware

Upgrade station firmware to the current release SRM 3.0-10 and AlphaBIOS 5.28 if necessary. To verify current versions, follow these steps:

1. Reboot the server.

2. From the AlphaBIOS window, press F2 to enter Set-Up.

3. Select Display System Configuration.

To update the firmware from the CD-ROM, perform the following steps:

1. Reboot the server.

2. When the system starts the AlphaBIOS, press the F2 key to enter Set-Up.

3. Place the Firmware Update CD in the CD drive.

4. Select "Upgrade AlphaBIOS" from the menu.

   The system reinitializes and proceeds to start the Loadable Firmware Update (LFU).

5. Type cdao at the "Select Loadable Firmware Device" prompt.

6. Type update at the UPD> prompt.

7. Type exit at the UPD> prompt when all updates have been completed.

The system then re-initializes itself and boots up normally.

The firmware is available on the Alpha Systems Firmware Update CD-ROM Version 3.8 and on the Internet at the following URL:

`ftp://ftp.digital.com/pub/Digital/Alpha/firmware`

Date and Time

From the AlphaBIOS Setup screen, select CMOS Setup to set the date and time.

Disk Storage Configuration

Format the disks on the system. From AlphaBIOS Setup, select Hard Disk Setup. Do a quick format of all disks connected to SCSI controllers.

RAID Configuration

Configure and setup RAID arrays (RAIDsets) using the RAID Configuration Utility (RCU). Refer to the *RAID Array 230/Plus Subsystem RAID Configuration Utility* manual provided with the RAID Array 230/Plus Controller (KZPAC-CA) for details on using the RAID Configuration Utility and RAID.

EISA Configuration Utility (ECU)

Even if EISA options are not present on the system, running ECU ensures that the NVRAM data is in a format compatible with Windows NT. Follow these steps:

1. Insert the floppy containing the ECU into the floppy drive.

2. From AlphaBIOS Setup, select Utilities.

3. Select "ECU from floppy."

4. Save and exit the configuration when done.

Operating System

Perform the following steps to complete installation of the operating system:

1. Load the Windows NT Server Version 4.0 CD-ROM into the CD drive.

2. Follow the prompts to complete the installation.

3. When prompted, "Do you want to install IIS," make sure this option is selected.

4. Install Service Pack 3 for Windows NT 4.0.

This HiTest suite includes the following service packs:

Software	Service Pack
Windows NT Server	Service Pack 3 for Windows NT 4.0
IIS	Service Pack 1
SMS	Service Pack 1

Windows NT Server Service Pack 3 when installed, automatically upgrades IIS to Service Pack 1 V3.0. The SMS CD automatically installs SMS on the Management Station to the Service Pack 1 level.

_____ **Note** _____

The service packs are available on the Microsoft support page located at:
`ftp://ftp.microsoft.com`

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Applications

IIS is installed during the Windows NT Server installation process. To verify IIS installation follow these steps:

1. Open the Control Panel.

2. Select Network from the display.

3. Click the Services tab.

4. Make sure Microsoft Internet Information Server 3.0 is listed.

If your IIS software is not factory installed, follow these steps:

1. Open the Control Panel.

2. Select Network from the display.

3. Click the Services tab.

4. Click the Add button.

5. Select Microsoft Internet Information Server.

6. Click OK.

7. Specify the path to the NT server distribution CD-ROM.

8. Add Service Pack 3.

4

Interoperability Tests and Results

This chapter 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.

This chapter describes:

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

Overview of Results

Interoperability testing was performed successfully on the MS Internet Information Server NT AlphaServer 4x00 HiTest Suite. The tests verified that all the Internet services performed as expected.

Test Environment

Figure 4-1 shows the MS Internet Information Server test environment.

Figure 4-1: MS Internet Information Server Test Environment
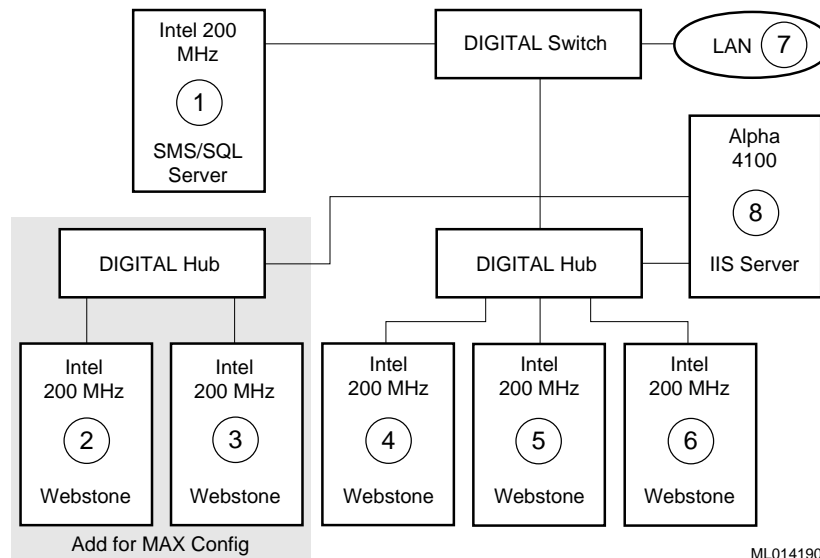
❶ SMS Server polls/audits AlphaServer 4100

❷–❻ Clients making web page requests

❼ Remote station performs ad hoc file I/O and FTP transactions

❽ AlphaServer 4100 IIS Server under test

Test Tools

Interoperability testing was performed using the following tool:

- **Webstone, Version 2.0c** (Ziff-Davis WWW Benchmark tool)

  Webstone is a benchmark tool that generates continuous accesses to web pages on a specified server. The size of pages accessed ranged from 1–500 Kbytes. For more specific information on Webstone 2.0c, see the web page located at:

  ```
  http://www.sgi.com/Products/WebFORCE/Resources
  ```

Test Configuration

The test load was generated as follows:

- The average test duration was 40 hours.

- Windows NT workstations running Webstone ran up to several processes performing continuous accesses to web pages.

- Windows NT Backup was used to perform data backup during the test.

- Ad hoc file I/O and FTP transfers were made from a remote PC.

- SMS performed routine tasks during the test.

- The failure of a single drive that was a member of a RAIDset was tested, ensuring RAID fault tolerance functionality.

Minimum Configuration

The minimum configuration includes three disks connected to one SCSI controller, (KZPDA-AA), as shown in Table 4-1. One disk served as the Windows NT system and paging disk. The other two disks contained IIS, file shares, and log files.

Table 4-1: Disk Configuration for the Minimum Configuration

Quantity	Capacity	Disk Content/Data	Disk Controller	RAID Configuration
1	4.3 GB	Windows NT system and Paging file	KZPDA-AA	JBOD
1	4.3 GB	Internet Information Server	KZPDA-AA	JBOD
1	4.3 GB	File Shares	KZPDA-AA	JBOD

Maximum Configuration

The maximum configuration includes 10 disks connected to two SCSI controllers; (1 KZPDA-AA and 1 KZPAC-CA), as shown in Table 4-2. The RAID disk sets were split across two channels of each controller for maximum performance.

Table 4-2: Disk Configuration for the Maximum Configuration

Quantity	Capacity	Disk Content/Data	Disk Controller	RAID Configuration
1	4.3 GB	Windows NT System & Paging File	KZPDA-AA	JBOD
1	4.3 GB	Log Files	KZPDA-AA	JBOD
1	30 GB RAIDset (eight 4.3 GB disk drives)	Internet Information Server (IIS)	KZPAC-CA	RAID 5

Test Process and Results

The following information describes the test results:

- **Internet Information Server –** During the test, the system served about 70 million Web pages.

- **File Shares –** Miscellaneous ad hoc file transfers were made throughout the test without errors.

- **Windows NT Backup –** Windows NT Backup performed the data backup and verification with no errors. Backup and restoration of the IIS databases was successful.

5

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.

RAID – When configuring the RAID disk sets using the RAID Array 200 RAID Configuration (RA200RCU.EXE) Utility, the initializing of disks can take a long time. It took about one hour to initialize a 4.3 GB disk. Estimate at least an hour when planning the configuration and setup of disks connected to the KZPAC-CA RAID controllers. After they are initialized, formatting requires only seconds, even for large arrays (32 GB formatted in less than one minute).

RAID disk sets initialize much quicker if the write policy for the RAID drives is set to *write-back*. After initialization is complete, the write policy should be changed back to *write-through*.

Network – When operating a server that is expected to provide high-performance network services (such as the Internet, Web, and Exchange), the server should be on its own LAN segment, preferably with a high-speed interconnection such as Fast Ethernet. This can be achieved by the use of an Ethernet switch.

The network adaptors must operate in 100 mbit mode to use the full capabilities of the server.

6
Problems and Resolutions

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

No problems were found.

Hardware

No problems were encountered.

Operating System

No problems were encountered.

Application

No problems were encountered.

A
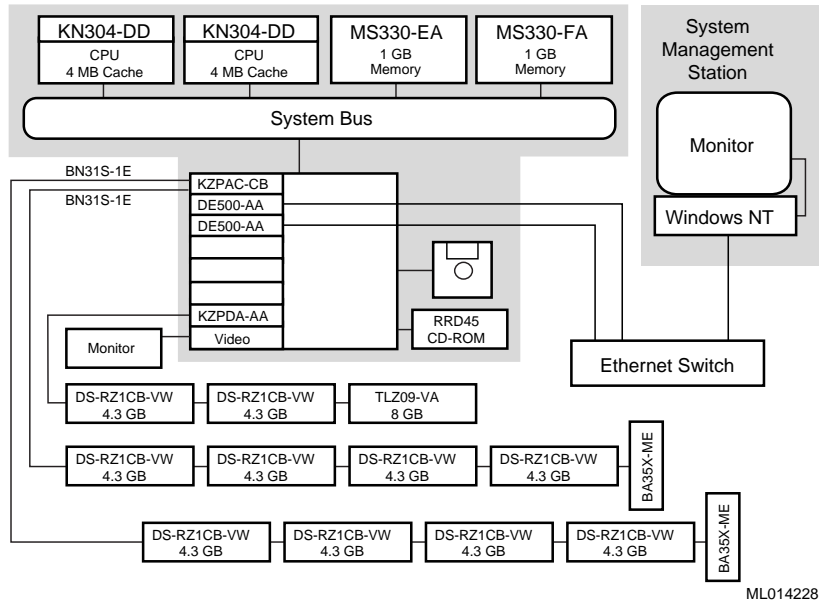# Detailed Hardware Configuration

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

- System Diagram

- AlphaServer 4x00 configurations, including:

    – System Motherboard

    – PCI Slot Usage

- Configuration Cabling

- Disk Configuration

System Diagram

Figure A-1 shows a diagram of the entire HiTest Suite.

Figure A-1: Internet Information Server Windows NT 4x00 Block Diagram

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AlphaServer 4x00 Configurations

Figure A-2 and Table A-1 show the AlphaServer 4x00 system motherboard and describe the minimum and maximum hardware configurations used in this HiTest Template.

Figure A-2: AlphaServer 4x00 Motherboard

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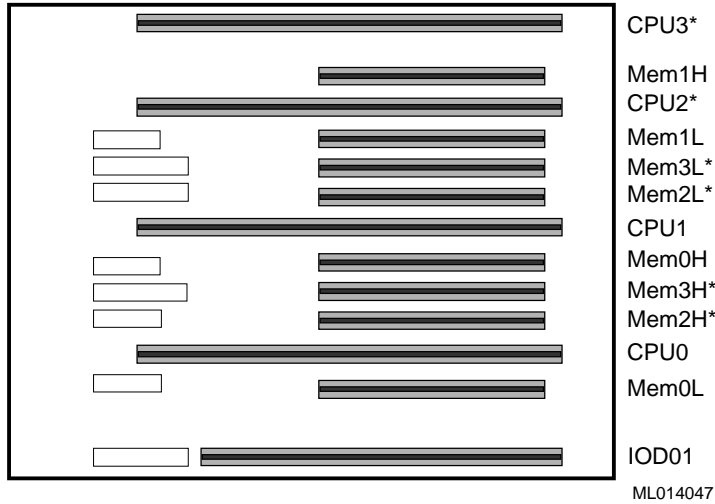
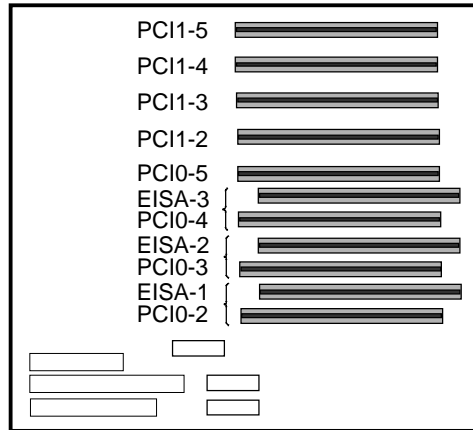*These slots do not exist on the AlphaServer 4000.

Table A-1: System Motherboard Configuration (Minimum and Maximum)

Slot	Minimum Configuration Options	Maximum Configuration Options	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-DD	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-DD	KN304-DD	466 MHz CPU 4 MB cache
Mem0L	MS330-EA	MS330-FA	Memory pair 0 (1 of 2)
IOD01	Bridge	Bridge	System bus to PCI bus bridge module
* These slots do not exist on the AlphaServer 4000 system.			

AlphaServer 4x00 PCI Slot Usage

Figure A-3 and Table A-2 show the PCI Slot Configuration.

Figure A-3: PCI Slot Configuration

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The last memory option should be placed in memory slot 0, the next largest in slot 1, and so forth.

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

Slots	Minimum Configuration Options	Maximum Configuration Options	Description
PCI1-5	open	KZPAC-CA	PCI RAID controller
PCI1-4	DE500-AA	DE500-AA	Ethernet adapter
PCI1-3	open	DE500-AA	Ethernet adapter
PCI1-2	KZPDA-AA	open	SCSI host adapter
PCI0-5	open	open	–
EISA-3/ PCI0-4	open	open	–
EISA-2/ PCI0-3	open	KZPDA-AA	SCSI host adapter
EISA-1/ PCI0-2	VIDEO	VIDEO	Video card

Configuration Cabling

Table A-3 lists the major cable in the HiTest Template.

Table A-3: Configuration Cabling

Part Number	Qty	Description	From	To
BN31S-1E	2	External 1.5-Meter 16-Bit SCSI-2 Cable (90°)	Controller Board	Shelf Personality Module (JA1)*
* See *StorageWorks™ Solutions BA356-SB 16-Bit Shelf User's Guide.* (Part Number EK-356KB-UG).				

Disk Configuration

Figure A-4 shows the slot layout for the BA356 Storage Shelf.

Figure A-4: BA356 Storage Shelf

CXO-4319A-MC
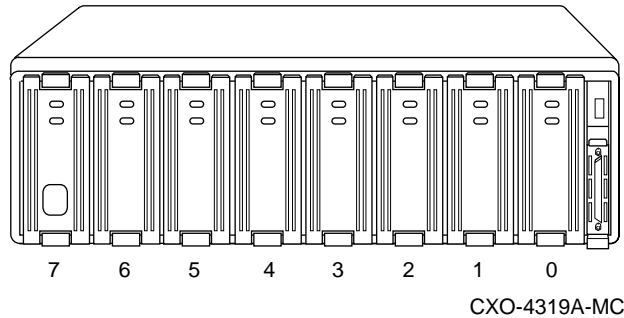
Minimum Configuration

Table A-4: lists the minimum slot configuration for this HiTest system.

Table A-4: Minimum Configuration (Shelf 1 - Front of Pedestal, Top)

Slot	Option/ Part Number	Description
0	DS-RZ1CB-VW	Windows NT, Paging, and Logfiles
1	DS-RZ1CB-VW	IIS RAID 1
2	DS-RZ1CB-VW	IIS RAID 1
3	Open	–
4	Open	–
5	Open	–
6	TLZ09-VA	Tape Drive
7	Power Supply	Power Supply

Maximum Configuration

Table A-5 through Table A-7 lists the maximum slot configuration for this HiTest System.

Table A-5: Maximum Configuration (Shelf 1 - Front of Pedestal, Top)

Slot	Option/ Part Number	Description
0	DS-RZ1CB-VW	Windows NT and Paging
1	DS-RZ1CB-VW	Log Files
2	Open	–
3	Open	–
4	Open	–
5	Open	–
6	TLZ09-VA	Tape drive
7	Power Supply	Power supply

Table A-6: Maximum Configuration (Shelf 2 - Front of Pedestal, Bottom)

Slot	Option/ Part Number	Description
0	DS-RZ1CB-VW	IIS (RAIDset member)
1	Open	–
2	DS-RZ1CB-VW	IIS (RAIDset member)
3	Open	–
4	DS-RZ1CB-VW	IIS (RAIDset member)
5	Open	–
6	DS-RZ1CB-VW	IIS (RAIDset member)
7	Power Supply	Power Supply

Table A-7: Maximum Configuration (Shelf 3 - Rear of Pedestal, Top)

Slot	Option/ Part Number	Description
0	DS-RZ1CB-VW	IIS (RAIDset member)
1	Open	–
2	DS-RZ1CB-VW	IIS (RAIDset member)
3	Open	–
4	DS-RZ1CB-VW	IIS (RAIDset member)
5	Open	–
6	DS-RZ1CB-VW	IIS (RAIDset member)
7	Power Supply	Power supply