



# MS Exchange Windows NT AlphaServer 4x00

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## 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 Exchange 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-HESNA-HN. D01) in your correspondence about this manual.

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

## 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-to high-end MS Exchange 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.

## 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 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 Microsoft Exchange Windows NT AlphaServer 4x00 HiTest Suite consists of the following software components:

- Windows NT Server
- MS Exchange
- MS Internet Information Server (IIS)
- System Management Server (SMS)

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

MS Exchange enables customers to easily, quickly and cost-effectively create, deploy and maintain powerful interactive and collaborative Internet and Intranet applications. AlphaServer 4x00 systems provide high speed, availability, and reliability for Windows NT servers.

The AlphaServer 4100 supports a large number of MS Exchange users, higher than any other offering in the industry, to minimize the total cost of ownership and complexity of management.

With DIGITAL AlphaServer systems running Windows NT, users can take their MS Exchange servers to new heights—high availability, high performance, and the ability to support a higher number of mail users.



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## 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 Exchange Windows NT AlphaServer 4x00 HiTest Suite. The ranges of hardware include 512 MB through 2 GB of memory, five through twenty 4.3 GB disks, and multiple Fast Ethernet and RAID controllers.

Table 2-2 lists the systems 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 medium- to high-end MS Exchange 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.

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

<b>MS Exchange HiTest AppSet</b>				
<b>Windows NT, AlphaServer 4x00 5/466 HiTest Foundation</b>				
<i>For documentation and updates: <a href="http://cosmo.tay.dec.com">http://cosmo.tay.dec.com</a> and <a href="http://www.partner.digital.com:9003">http://www.partner.digital.com:9003</a> For hardcopy of this Suite's HiTest Notes, order EK-HESNA-HN.</i>				
Line Item	Description	Part Number	Tested Range	
			Min	Max
<b>AppSet Software</b>				
1	<b>MS Exchange V5.0</b> Please purchase from a Microsoft reseller or contact: <a href="http://www.microsoft.com">http://www.microsoft.com</a>	Microsoft	1	1
2	<b>MS Internet Information Server (IIS) V3.0</b> For more information, contact Microsoft at: <a href="http://www.microsoft.com">http://www.microsoft.com</a>	Included with item 16	1	1
<b>Foundation Hardware</b>				
3	<i>Select just one base system:</i> <b>AlphaServer 4100 5/466 Windows NT, 512 MB</b> <b>AlphaServer 4100 5/466 Windows NT, 1 GB</b> <b>AlphaServer 4100 5/466 Windows NT, 2 GB</b> <b>AlphaServer 4000 5/466 Windows NT, 512 MB</b> <b>AlphaServer 4000 5/466 Windows NT, 1 GB</b> <b>AlphaServer 4000 5/466 Windows NT, 2 GB</b>  <i>Hardware includes:</i> <ul style="list-style-type: none"> <li>• 5/466 MHz CPU with 4 MB cache</li> <li>• PB2GA-JB TRIO64 1 MB Graphics</li> <li>• DE500-AA 10/100 Mbit Fast Ethernet</li> <li>• KZPDA-AA FW SCSI and cable</li> <li>• SCSI CD-ROM drive</li> <li>• RX23L-AB 1.44 MB Floppy drive</li> <li>• LK47W-A2 PS/2 style keyboard</li> <li>• Three-button PS/2 compatible mouse</li> </ul> <i>Software includes:</i> <ul style="list-style-type: none"> <li>• Windows NT Server operating system with 10-client access license and media</li> </ul>	DN-51JAA-EB DN-51JAA-FB DN-51JAA-GB DN-53JEA-EA DN-53JEA-FA DN-53JEA-GA	1	1
4	<b>Pedestal with StorageWorks shelf</b>  <i>Hardware includes:</i> <ul style="list-style-type: none"> <li>• 4.3 GB 7200 RPM UltraSCSI Disk (RZ1CB-VW)</li> <li>• Pedestal with one StorageWorks shelf and mounting kit</li> </ul>	BA30P-AB	1	1
5	<b>466 MHz CPU Windows NT SMP UPG</b>	KN304-DD	0	1

<b>MS Exchange HiTest AppSet</b>				
<b>Windows NT, AlphaServer 4x00 5/466 HiTest Foundation</b>				
For documentation and updates: <a href="http://cosmo.tay.dec.com">http://cosmo.tay.dec.com</a> and <a href="http://www.partner.digital.com:9003">http://www.partner.digital.com:9003</a> For hardcopy of this Suite's HiTest Notes, order EK-HESNA-HN.				
Line Item	Description	Part Number	Tested Range	
			Min	Max
6	<b>512 MB Memory Option</b> <b>1 GB Memory Option</b> <b>Note:</b> This HiTest Template supports a memory range from 512 MB to 2 GB. When selecting memory, stay within the range.	<b>MS330-EA</b> <b>MS330-FA</b>	0	See note
7	<b>PCI three-port RAID Controller</b>	<b>KZPAC-CA</b>	0	2
8	<b>SCSI-2 cable, external 1.5-meter 16-bit (90°)</b>	<b>BN31S-1E</b>	0	2
9	<b>SCSI-2 cable, external 1.5-meter 16-bit (straight)</b>	<b>BN31M-1E</b>	0	2
10	<b>Shelf expansion unit, 7 device, 16 bit SCSI</b>	<b>BA36R-SB</b>	0	2
11	<b>Active SCSI-2 terminator, 16 bits</b>	<b>BA35X-ME</b>	0	2
12	<b>4.3 GB 7200 RPM UltraSCSI Disks</b> <b>Note:</b> When UltraSCSI drives are used in a BA356 Series StorageWorks Shelf, ensure that the shelf contains a 180W power supply (DS-BA35X-HH).	<b>DS-RZ1CB-VW</b>	4	19
13	<b>4/8 GB DAT Tape Drive</b>	<b>TLZ09-VA</b>	1	1
14	<b>PCI 10/100-Mbps Fast Ethernet controller</b>	<b>DE500-AA</b>	0	2
15	<i>Select one high-resolution color monitor:</i> <b>15-in Flat-square with 0.28 dot pitch</b> <b>17-in Trinitron aperture grille, 0.25mm</b> <b>21-in Diamondtron aperture grille, 0.28 dot pitch</b>	<b>SN-VRCX5-WA</b> <b>SN-VRTX7-WA</b> <b>SN-VRCX1-WA</b>	1	1
<b>Foundation Software</b>				
16	<b>Windows NT Server 4.0</b> Contact Microsoft at: <a href="http://www.microsoft.com">http://www.microsoft.com</a> <b>Note:</b> Install Windows NT Service Pack 3 available from: <a href="ftp://ftp.microsoft.com/bussys/winnt">ftp://ftp.microsoft.com/bussys/winnt</a>	<b>Included with item 3</b>	1	1
17	<b>Microsoft Systems Management Server Agents for Alpha Systems</b> <b>Note:</b> The Intel version of Microsoft Systems management Server (Table 2-2, line item 8) includes both the Intel and ALPHA agents).	<b>Microsoft</b>	0	1
18	<b>System Management Station</b>	<b>See Table 2-2</b>	0	1

Table 2-2: Systems Management Station Template

<b>MS Exchange HiTest AppSet System Management Station</b>				
For documentation and updates: <a href="http://cosmo.tay.dec.com">http://cosmo.tay.dec.com</a> and <a href="http://www.partner.digital.com:9003">http://www.partner.digital.com:9003</a> For hardcopy of this Suite's HiTest Notes, order EK-HESNA-HN.				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
<b>System Management Station Hardware</b>				
<b>Note:</b> 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	<b>Prioris XL 6200</b> <i>Hardware includes:</i> <ul style="list-style-type: none"> <li>• 200 MHz CPU, 256 KB cache</li> <li>• Integrated Fast Ethernet</li> <li>• 12 X CD-ROM</li> <li>• 2.1 GB Wide SCSI disk drive</li> <li>• 1.44 MB diskette drive</li> <li>• 32 MB 60 ns EDO DIMM memory</li> </ul> <b>Note:</b> 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	<b>Country Kit</b> <i>Select country-specific kit which includes keyboard.</i> <b>Note:</b> Orders that are not North American should substitute the appropriate country kit.	FR-PC94K-AA	1	1
3	<b>32 MB 60 ns EDO DIMM Memory</b>	FR-PCSMA-AC	1	1
4	<i>Select one high-resolution color monitor (the 17" is recommended):</i> <b>15 inch flat-square 0.28 dot pitch</b> <b>17 inch flat-square 0.28 dot pitch</b>	FR-PCXBV-YW FR-PCXBV-ZW	1	1
<b>System Management Station Software</b>				
5	<b>Windows NT Server, Version 4.0</b> Purchase from a Microsoft reseller or contact Microsoft at: <a href="http://www.microsoft.com">http://www.microsoft.com</a>	Microsoft	1	1
6	<b>Windows NT Service 4.0</b> Contact Microsoft at: <a href="http://www.microsoft.com">http://www.microsoft.com</a> <b>Note:</b> Install Windows NT Service Pack 3 available from: <a href="ftp://ftp.microsoft.com/bussys/winnt">ftp://ftp.microsoft.com/bussys/winnt</a>	Microsoft	1	1

<b>MS Exchange HiTest AppSet System Management Station</b>				
For documentation and updates: <a href="http://cosmo.tay.dec.com">http://cosmo.tay.dec.com</a> and <a href="http://www.partner.digital.com:9003">http://www.partner.digital.com:9003</a> For hardcopy of this Suite's HiTest Notes, order EK-HESNA-HN.				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
<b>System Management Station Software</b>				
7	<b>SQL server, Version 6.5</b> Purchase from a Microsoft reseller or contact Microsoft at: <a href="http://www.microsoft.com">http://www.microsoft.com</a>	Microsoft	1	1
8	<b>System Management Server, Version 1.2</b> Purchase from a Microsoft reseller or contact Microsoft at: <a href="http://www.microsoft.com">http://www.microsoft.com</a>	Microsoft	1	1
9	<b>Service Pack 1 for SMS (Build 786)</b> To access service packs, connect to: <a href="ftp://ftp.microsoft.com/bussys/winnt">ftp://ftp.microsoft.com/bussys/winnt</a>	Microsoft	1	1

**Table 2-3: Component Revision Levels**

Hardware Component	Hardware	Firmware	Software
4/8 GB DAT Tape Drive (TLZ09-VA)	A04	0172	–
5/466 MHz CPU	A02	–	–
SCSI	A01	2	–
SCSI RAID Controller	E02	2.42 BIOS	–
4.3 GB Disk	A01	LYJ0	–
Ethernet Controller	B01	3.2	–
SRM Console	–	4.9-1	–
AlphaBIOS	–	5.32	–
12 X CD-ROM	–	0557	–
Software Component	Version/ Revision	Patch Level	
Windows NT Server	4.0	Windows NT Service Pack 3 (SP3)	
MS Exchange	5.0	MS Exchange Service Pack 1 (SP1)	
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.

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**Note**

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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.

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## 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 the console firmware to the current release SRM 4.9-10 and AlphaBIOS 5.32 if necessary. The firmware is available on the Alpha Systems Firmware Update CD-ROM Version 5.0.

You can order the customer firmware kit using order number (QY-003AA-A8). The customer firmware kit includes a quarterly update service.

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 `cda0` 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.

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#### Note

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The firmware can be downloaded from the Internet at the following URL:

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

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### 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:

1. Select Hard Disk Setup.
2. Do a quick format of all disks connected to SCSI controllers.

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**Note**

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Unformatted disks connected to the SCSI controllers will cause the NT installation to fail with the status code (0x4, 0x1, 0,0).

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### 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 User's Guide* (Part number AA-R07GA-TE) 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:

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.
5. Install MS Exchange from the CD.
6. Install MS MS Exchange Service Pack 1 from the CD.
7. Install System Management Server (SMS). The SMS CD automatically installs SMS on the System Management Station to the Service Pack 1 level.
8. Reapply Service Pack 3 (SP3) for Windows NT.



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## 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

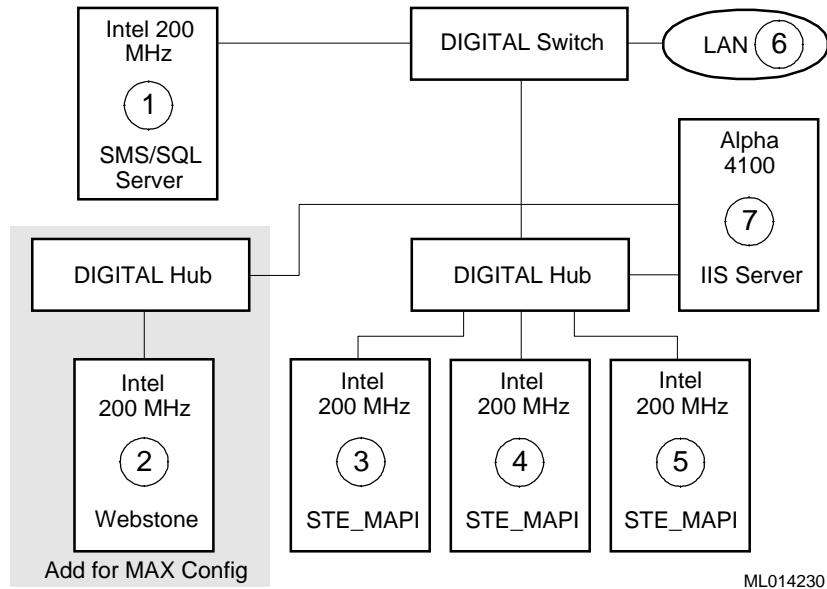
### Overview of Results

Interoperability testing was performed successfully on the MS Exchange NT AlphaServer 4x00 HiTest Suite. The tests verified that all mail, messaging and Internet services performed as expected.

### Test Environment

Figure 4-1 shows the MS Exchange test environment.

Figure 4-1: MS Exchange Test Environment



- ❶ SMS Server polls/audits AlphaServer 4100
- ❷ Client making web page requests
- ❸–❺ Clients performing mail operations
- ❻ Remote station performs ad hoc file I/O and FTP transactions
- ❼ AlphaServer 4100 Exchange/IIS Server under test

## Test Tools

Interoperability testing was performed using the following tools:

- **Webstone, Version 2.0c**

Webstone is a benchmark tool that generates continuous accesses to web pages on a specified server. The size of pages accessed ranged from 1–5000 Kbytes. For more specific information on Webstone 2.0c, see the web page located at:

<http://www.sgi.com/Products/WebFORCE/Resources>

- **STE\_MAPI, Version 1.0**

The STE\_MAPI tool is designed to exercise and stress a mail server that supports the Messaging Application Programming Interface (MAPI). The tool's main function is to send and receive mail messages between multiple mail users, and perform data integrity checks on those messages.

## Test Configuration

The test load was generated as follows:

- The average test duration was 40 hours.
- Windows NT workstations running DIGITAL STE\_MAPI generated MS Exchange client workload.

- Windows NT Backup was used to perform data backup during the test.
- SMS performed routine tasks during the test.
- Webstone client making web page requests.

### Minimum Configuration

The minimum configuration includes five 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 four disks contained MS Exchange mail data, 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 RAIDset (two 4.3 GB disk drives)	MS Exchange (application and data)	KZPDA-AA	RAID 1
1	4.3 GB RAIDset (two 4.3 GB disk drives)	Internet Information Server, Log Files and file shares	KZPDA-AA	RAID 1

### Maximum Configuration

The maximum configuration includes 20 disks connected to 3 SCSI controllers; (1 KZPDA-AA and 2 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
4	4.3 GB each	File Shares	KZPDA-AA	JBOD
1	25.8 GB RAIDset (seven 4.3 GB disk drives)	MS Exchange	KZPAC-CA	RAID 5
1	25.8 GB RAIDset (seven 4.3 GB disk drives)	Internet Information Server (IIS)	KZPAC-CA	RAID 5

### Test Process and Results

The following information describes the test results:

- **MS Exchange** – The STE\_MAPI clients sent and received 972,000 mail messages. The clients performed data verification and then deleted the message. Mail messaging operations were successful.
- **Internet Information Server** – During the test, the system served about 11 million web pages. Serving of these web pages was successful.
- **Windows NT Backup** – Windows NT Backup performed the data backup and verification with no errors. Backup and restoration of the MS Exchange databases was successful.

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## 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.



# 6

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## Problems and Resolutions

This chapter describes any problems that may have been encountered during the testing that have 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.

### **Hardware**

No problems were encountered.

### **Operating System**

No problems were encountered.

### **Application**

### **MS Exchange**

No problems were encountered.





# A

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## Detailed Hardware Configuration

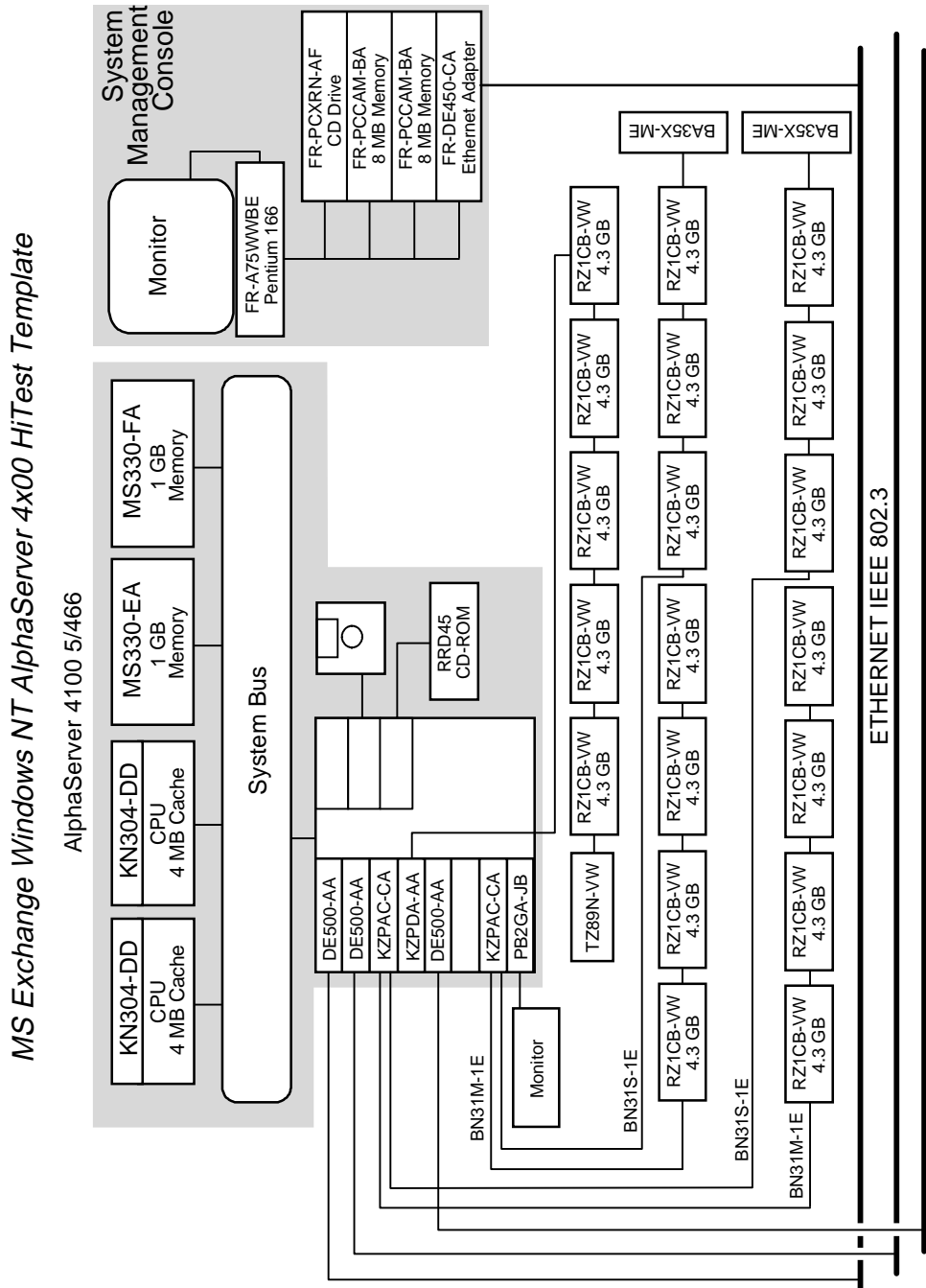
This appendix describes the minimum and maximum hardware configuration for the following:

- System Diagram
- AlphaServer 4x00 configurations, including:
  - System Motherboard
  - PCI Slot Usage
- Configuration Cabling
- Storage Configuration

### System Diagram

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

Figure A-1: System Diagram

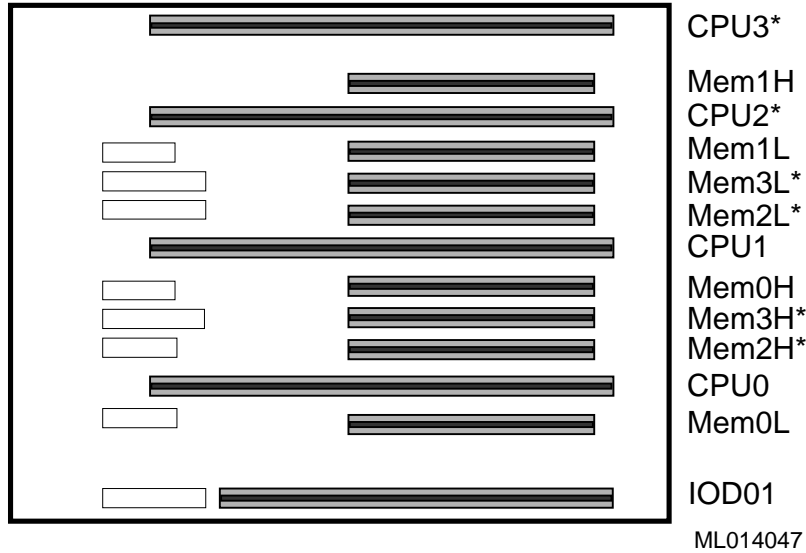


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## AlphaServer 4x00 System Motherboard

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**



\*These slots do not exist on the AlphaServer 4000.

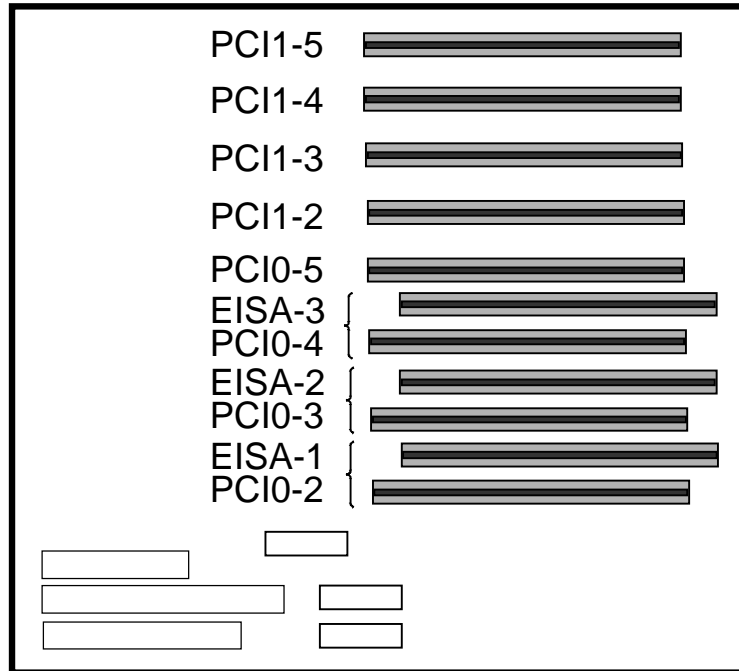
**Table A-1: System Motherboard Configuration (Minimum and Maximum)**

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

Slots	Minimum Configuration Options	Maximum Configuration Options	Description
PCI1-5	open	DE500-AA	Ethernet adapter
PCI1-4	DE500-AA	DE500-AA	Ethernet adapter
PCI1-3	open	KZPAC-CA	PCI RAID controller
PCI1-2	KZPDA-AA	KZPDA-AA	Controller
PCI0-5	open	DE500-AA	Ethernet adapter
EISA-3/ PCI0-4	open	open	-
EISA-2/ PCI0-3	open	KZPAC-CA	PCI RAID controller
EISA-1/ PCI0-2	PB2GA-JB	PB2GA-JB	Video card

## Configuration Cabling

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

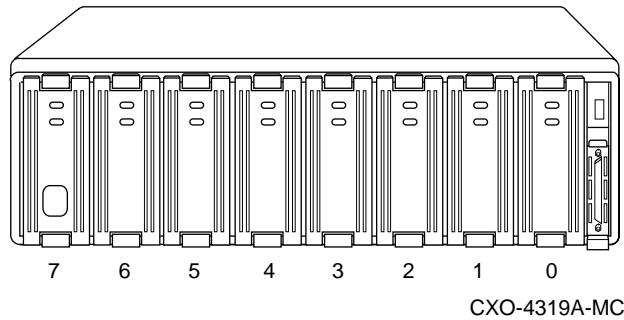
**Table A-3: Configuration Cabling**

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)*
BN31M-1E	2	External 1.5-Meter 16-Bit SCSI-2 Cable (straight)	Controller Board	Shelf Personality Module (JB1)*
* See <i>StorageWorks™ Solutions BA356-SB 16-Bit Shelf User's Guide</i> . (Part Number EK-356KB-UG).				

## Storage Configuration

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

**Figure A-4: BA356 Storage Shelf**



## 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	RZ1CB-VW	Windows NT, Paging, and Logfiles
1	RZ1CB-VW	MS Exchange
2	RZ1CB-VW	MS Exchange
3	RZ1CB-VW	IIS
4	RZ1CB-VW	IIS
5	Open	–
6	TLZ09-VA	Tape Drive
7	Power Supply	Power Supply

## Maximum Configuration

Table A-5 through Table A-7 list 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	RZ1CB-VW	Windows NT and Paging
1	RZ1CB-VW	Log Files
2	RZ1CB-VW	File Shares
3	RZ1CB-VW	File Shares
4	RZ1CB-VW	File Shares
5	RZ1CB-VW	File Shares
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	RZ1CB-VW	MS Exchange (RAIDset member)
1	RZ1CB-VW	IIS (RAIDset member)
2	RZ1CB-VW	MS Exchange (RAIDset member)
3	RZ1CB-VW	IIS (RAIDset member)
4	RZ1CB-VW	MS Exchange (RAIDset member)
5	RZ1CB-VW	IIS (RAIDset member)
6	RZ1CB-VW	MS Exchange (RAIDset member)
7	Power Supply	Power Supply

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

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