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Lotus Domino
Windows NT AlphaServer 4x00

DIGITAL HiTest Notes

Part Number: EK-HLDNA-HN. E01

October 1997

Revision/Update Information: This is a revised manual.

Digital Equipment Corporation
Maynard, Massachusetts

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Preface

This document provides an overview of DIGITAL HiTest Suites and detailed technical information about interoperability test results for the Lotus Domino 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 characterization 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-HLDNA-HN. E01) 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, WWW Serving and mail administration.

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 chapter of the HiTest Notes.

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

```
http://cosmo.tay.dec.com             (Intranet)
http://www.partner.digital.com:9003 (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 Lotus Domino Windows NT AlphaServer 4x00 HiTest Suite consists of the following software components:

- Windows NT Server

- Lotus Domino

- System Management Server (SMS)

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

Lotus Domino 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 Lotus Domino 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 Domino servers to new heights—high availability, high performance, and the ability to support a higher number of Notes users.

2
Configuration Data

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

Hardware and Software Components

Table 2-1 identifies the range of hardware and software components that can be configured using the Lotus Domino 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 console 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 Lotus Domino 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: Lotus Domino Windows NT AlphaServer 4x00 DIGITAL HiTest Template

<table>
<tr><td colspan="5">Lotus Domino <i>AppSet</i>
Windows NT, AlphaServer 4x00 5/466 HiTest Foundation</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-HLDNA-HN.</td></tr>
<tr><td rowspan="2">Line Item</td><td rowspan="2">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="5">AppSet Software</td></tr>
<tr><td>1</td><td>Lotus Domino V4.5A
To purchase please contact Lotus at:
http://www2.lotus.com/domino.nsf?OpenDatabase</td><td></td><td>1</td><td>1</td></tr>
<tr><td colspan="5">Foundation Hardware</td></tr>
<tr><td>2</td><td><i>Select one of the following base systems:</i>
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

<i>Hardware includes</i>:
• 5/466 MHz CPU with 4 MB cache
• 512 MB, 1 GB, <i>or</i> 2 GB memory
• PB2GA-JB TRIO64 1 MB Graphics
• DE500-AA 10/100 Mbps Fast Ethernet
• KZPDA-AA FW SCSI and cable
• SCSI CD-ROM drive
• RX23L-AB 1.44 MB diskette drive
• LK47W-A2 PS/2 style keyboard
• Three-button PS/2 compatible mouse

<i>Software includes</i>:
• 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-GB</td><td>1</td><td>1</td></tr>
<tr><td>3</td><td>Pedestal Kit AS 4100/4000 with StorageWorks shelf

<i>Hardware includes</i>:
• DS-RZ1CB-VW 4.3 GB 7200 RPM UltraSCSI Disk
• Pedestal with one StorageWorks shelf
Note: Where two part numbers or variants are separated by a "/", the first number applies to the Americas and Asia Pacific and the second number applies to Europe.
Note: BA30P-BA does not include a StorageWorks shelf and disk. When ordering this part you must also order an additional shelf and disk to meet the maximum configuration of this HiTest Suite.</td><td>BA30P-AB/BA</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</td><td>MS330-EA</td><td>0</td><td>1</td></tr>
</table>

Lotus Domino *AppSet* Windows NT, AlphaServer 4x00 5/466 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-HLDNA-HN.					
Line Item	**Description**	**Part Number**	**HiTest Range**		
			Min	**Max**
6	**1 GB Memory Option** **Note:** This HiTest Template supports a memory range from 512 MB to 2 GB. When selecting memory options, stay within the Template's 2 GB maximum. The AlphaServer 4100 System Drawer supports three additional memory options. The AlphaServer 4000 System Drawer supports one additional memory option. The largest memory option should be placed in memory slot 0, the next largest in slot 1, and so forth.	**MS330-FA**	0	1
7	**PCI three-port RAID Controller**	**KZPAC-CA**	0	2
8	**SCSI-2 cable, external 1.5-meter 16-bit (90 degree)**	**BN31S-1E**	0	2
9	**SCSI-2 cable, external 15-meter 16-bit (straight)**	**BN31M-1E**	0	2
10	**Shelf expansion unit, 7 device, 16-bit SCSI**	**BA36R-SB**	0	2
11	**Active SCSI-2 terminator, 16 bits**	**BA35X-ME**	0	2
12	**4.3 GB 7200 RPM UltraSCSI Disk** **Note:** When UltraSCSI drives are used in a BA356-series StorageWorks Shelf, ensure that the shelf contains a 180W power supply (DS-BA35X-HH).	**DS-RZ1CB-VW**	4	19
13	**8 GB 4mm DAT Tape Drive**	**TLZ09-VA**	1	1
14	**PCI 10/100-Mbit Fast Ethernet Adapter**	**DE500-AA**	0	2
15	*Select just one monitor:* **15-inch color monitor** **17-inch auto-scanning color monitor** **21-inch color monitor**	**SN-VRC15-WA** **SN-VRT17-WA** **SN-VRC21-WA**	1	1
Foundation Software					
16	**Windows NT Server 4.0**	Included with item 2	1	1
17	**Windows NT Service Pack 3 (SP3)** To access service packs, connect to: ftp://ftp.microsoft.com/bussys/winnt	Microsoft	1	1
18	**System Management Server (SMS) 1.2** Please purchase from a Microsoft reseller or contact Microsoft at: http://www.microsoft.com	Microsoft	1	1
19	**System Management Console**	See Table 2-2	0	1

Configuration Data

Table 2-2: System Management Console Template

<table>
<tr><td colspan="6" style="text-align:center">Lotus Domino <i>HiTest AppSet</i>
System Management Console</td></tr>
<tr><td colspan="6"><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–HLDNA–HN.</td></tr>
<tr><td>Line Item</td><td>Description</td><td>Part Number</td><td colspan="2">HiTest Range</td></tr>
<tr><td></td><td></td><td></td><td>Min</td><td>Max</td></tr>
<tr><td colspan="5" style="text-align:center">System Management Console Hardware</td></tr>
<tr><td colspan="5">Note: This HiTest Suite supports the use of a systems management console. 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 console option may be omitted without invalidating the HiTest Suite.</td></tr>
<tr><td>1</td><td>Prioris XL 6200

<i>Hardware includes:</i>
200 MHz CPU, 256 KB cache
Integrated Fast Ethernet
12 X CD-ROM
2.1 GB Wide SCSI disk drive
1.44 MB diskette drive
32 MB 60 ns EDO DIMM memory
Note: Customers that want to run Windows NT Server 4.0 must purchase Windows NT Server separately from a Microsoft authorized distributor.

Note: The substitution of any equivalently configured Intel based PC does not invalidate this HiTest configuration.</td><td>FR-B60WW-XD</td><td>1</td><td>1</td></tr>
<tr><td>2</td><td>Country Kit
<i>Select country-specific kit which includes keyboard.</i>

Note: Non-North American orders should substitute the appropriate country kit.</td><td>FR-PC94K-AA</td><td>1</td><td>1</td></tr>
<tr><td>3</td><td>32 MB 60 Ns EDO DIMM Memory</td><td>FR-PCSMA-C</td><td>1</td><td>1</td></tr>
<tr><td>4</td><td><i>Select one high-resolution color monitor (the 17" is recommended):</i>
15 inch flat-square 0.28 dot pitch
17 inch flat-square 0.28 dot pitch</td><td>

FR-PCXBV-YW
FR-PCXBV-ZW</td><td>

1
1</td><td>

1
1</td></tr>
<tr><td colspan="5" style="text-align:center">System Management Console Software</td></tr>
<tr><td>5</td><td>Windows NT Server, Version 4.0
Please purchase from a Microsoft reseller or contact Microsoft at: http://www.microsoft.com</td><td>Microsoft</td><td>1</td><td>1</td></tr>
<tr><td>6</td><td>Windows NT Service Pack 3 (SP3)
To access service packs, connect to: ftp://ftp.microsoft.com/bussys/winnt</td><td>Microsoft</td><td>1</td><td>1</td></tr>
<tr><td>7</td><td>SQL server, Version 6.5
Please purchase from a Microsoft reseller or contact Microsoft at: http://www.microsoft.com</td><td>Microsoft</td><td>1</td><td>1</td></tr>
<tr><td>8</td><td>System Management Server (SMS) V1.2
Please purchase from a Microsoft reseller or contact Microsoft at: http://www.microsoft.com</td><td>Microsoft</td><td>1</td><td>1</td></tr>
<tr><td>9</td><td>Service Pack 1 for SMS (Build 786)
To access service packs, connect to: ftp://ftp.microsoft.com/bussys/winnt</td><td>Microsoft</td><td>1</td><td>1</td></tr>
</table>

Special Configuration Rules

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

_____

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).

_____ **Note** _____

Service Packs must be reapplied after installing any new software.

_____

Table 2-3: Component Revision Levels

Hardware Component	Hardware	Firmware	Software
8 GB DAT Tape Drive (TLZ09-VA)	A04	0172	–
5/466 MHz CPU	A02	–	–
SCSI KZPDA-AA	A01	–	–
SCSI RAID Controller (KZPAC-CA)	E03	2.42 BIOS	–
4.3 GB Disk	A01	0656	–
Ethernet Adapter	B01	1.1	–
SRM Console	n/a	4.9-1	–
AlphaBIOS	–	5.32	–
12 X CD-ROM	–	0436	–
Software Component	**Version/ Revision**	**Patch Level**	
Windows NT Server	4.0	Service Pack 3 (SP3)	
Lotus Domino	4.5A	–	
System Management Server	1.2	Service Pack 1 (Build 786)	
EISA Configuration Utility (ECU)	1.9	–	
RAID Configuration Utility (RCU)	4.73	–	
RAID Management Utility for NT	1.26	–	

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 console firmware to current release SRM 4.9-1 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 key F2 to enter Set-Up.

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

4. Select "Upgrade AlphaBIOS" from the menu.

The system re-initializes 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.

_____ **Note** _____

The firmware can be downloaded from 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 "Run ECU from floppy."

4. Save and exit the configuration when done.

Operating System

Install the NT Server software as follows:

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

2. From AlphaBIOS Setup, select "Install Windows NT," and press Enter.

3. Follow the prompts to complete the installation.

4. Install Service Pack 3 for Windows NT 4.0.

_____ **Note** _____

The service packs and hot fixes are available on the Microsoft support page located at:

```
ftp://ftp.microsoft.com/bussys/winnt/winnt-
public/fixes/usa/nt40/
```

Service Packs must be reapplied after installing any new software.
_____

Applications

Install Lotus Domino as follows:

1. From the Setup Options menu, select Custom Installation.

2. From the Custom Installation menu, select the Notes Performance Monitor Component.

3. Edit the `notes.ini` file and add "http" to the line with the "servertask" environment variable so that the web server starts up automatically with Lotus Domino.

4. Ensure that the `\notes` directory is included in the path for Windows NT. Refer to the Windows NT online help for information.

5. At the command prompt, use the `CD` command to change to the notes directory and invoke the notesreg.bat batch file as in the following example:

   ```
   notesreg.bat c:/notes
   ```

6. Install the mail data on a dedicated disk or RAIDset.

7. Install the WWW data on a dedicated disk or RAIDset.

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 successfully performed on the Lotus Domino Windows NT AlphaServer 4x00 HiTest Suite. The tests verified that the business processes functioned correctly.

Test Environment

Figure A-1 shows the Lotus Domino Windows NT AlphaServer 4x00 test environment.

Figure A-1: Test Environment
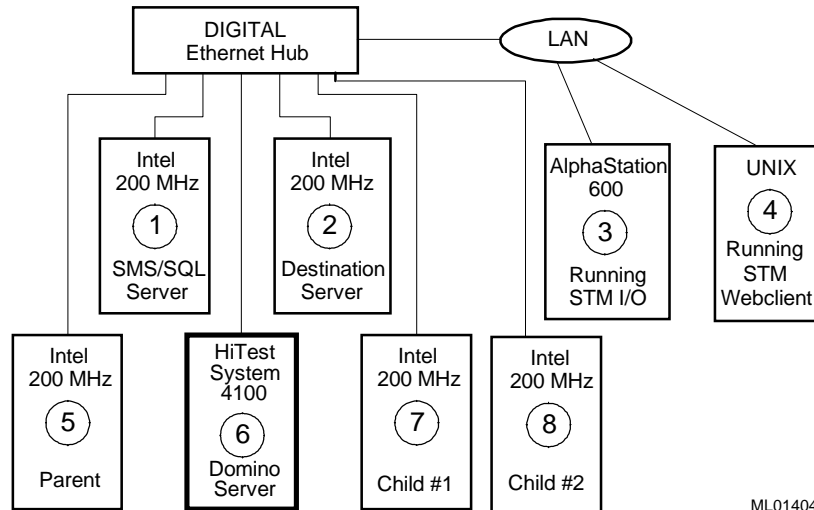
ML014046

❶ SMS Server polls/audits AlphaServer 4100
❷ Mail recipient
❸ File share testing
❹ Client making web page requests
❺ Parent instructs Child to send mail
❻ AlphaServer 4100 HiTest Domino Server
❼ Child #1 sends mail to the HiTest AlphaServer which routes mail to the destination server
❽ Child #2 sends mail to the HiTest AlphaServer which routes mail to the destination server

Test Tools

Interoperability testing was performed using the following tools:

- **NotesBench for Lotus Domino** (Lotus Development Corporation)
  NotesBench is a tool that exercises the notes server mail functions, including mail routing and interactive mail. Lotus has specific criteria that define acceptable performance; response time must be less than five seconds.

- **STM Webclient Version 1.1** (Internal Digital Equipment Corporation test tool)
  The STM Webclient tool was used to generate web page accesses. The size of pages accessed ranged from 1–64 KB. This tool performs data integrity checks on every page accessed.

- **STM I/O Tool Version 1.1-002** (Internal Digital Equipment Corporation test tool)
  STE_IO.EXE generated and copied data to the file shares and performed integrity checking on the data copied.

Test Configuration

The test load was generated as follows:

- The average test duration was 40 hours.

- Windows NT Workstations running Lotus NotesBench generated Lotus Domino Mail client workload.

- STM Webclient ran several processes, with each process attempting an access to a web page every 0.01 seconds.

- STM I/O Tool was run continuously throughout the test.

- SMS performed routine tasks during the test.

Minimum Configuration

The minimum configuration includes five disks connected to one SCSI controller, (KZPDA-AA), as shown in Table 4-1.

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	Lotus Domino mail data	KZPDA-AA	JBOD
1	4.3 GB	Lotus Domino WWW data	KZPDA-AA	JBOD
1	4.3 GB	File Shares	KZPDA-AA	JBOD
1	4.3 GB	Log files	KZPDA-AA	JBOD

Maximum Configuration

The maximum configuration includes 20 disks connected to three SCSI controllers (1 KZPDA-AA and 2 KZPAC-CAs), as shown in Table 4-2. The RAID disk sets were split across two channels of each controller for maximum performance. One RAID controller served the Lotus Domino mail data and another served the Lotus Domino WWW data.

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 and paging	KZPDA-AA	JBOD
1	4.3 GB	Log files	KZPDA-AA	JBOD
4	4.3 GB each	File Shares	KZPDA-AA	JBOD
1	17.2 GB RAIDset (eight 4.3 GB disk drives)	Lotus Domino mail data	KZPAC-CA	RAID 0+1
1	21.5 GB RAIDset (six 4.3 GB disk drives)	Lotus Domino WWW data	KZPAC-CA	RAID 5

Test Process and Results

The following information describes the test results:

- **Lotus Domino Mail** – The simulated mail clients (NotesBench processes) reported no errors and response times met Lotus Development Corporation criteria for acceptable performance.

- **Lotus Domino Web Server** – The STM Webclient tool read about 0.5 million pages. STM Webclient did not report any errors.

- **File Shares** – STM/IO tool reported no errors and found no data corruption. The WinBatch scripts reported no errors during file copy and comparison operations.

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 2300 RAID Configuration (RA230RCU.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).

- **Network** – When operating a server that is expected to provide high-performance network services (such as the Web, Lotus Domino, and so forth), 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.

  Backup and Restore operations completed successfully using NT Backup. There was no data corruption.

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.

The following problems were identified during testing:

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

- Lotus Domino Windows NT 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.

Detailed Hardware Configuration

**Figure A-1: System Diagram**
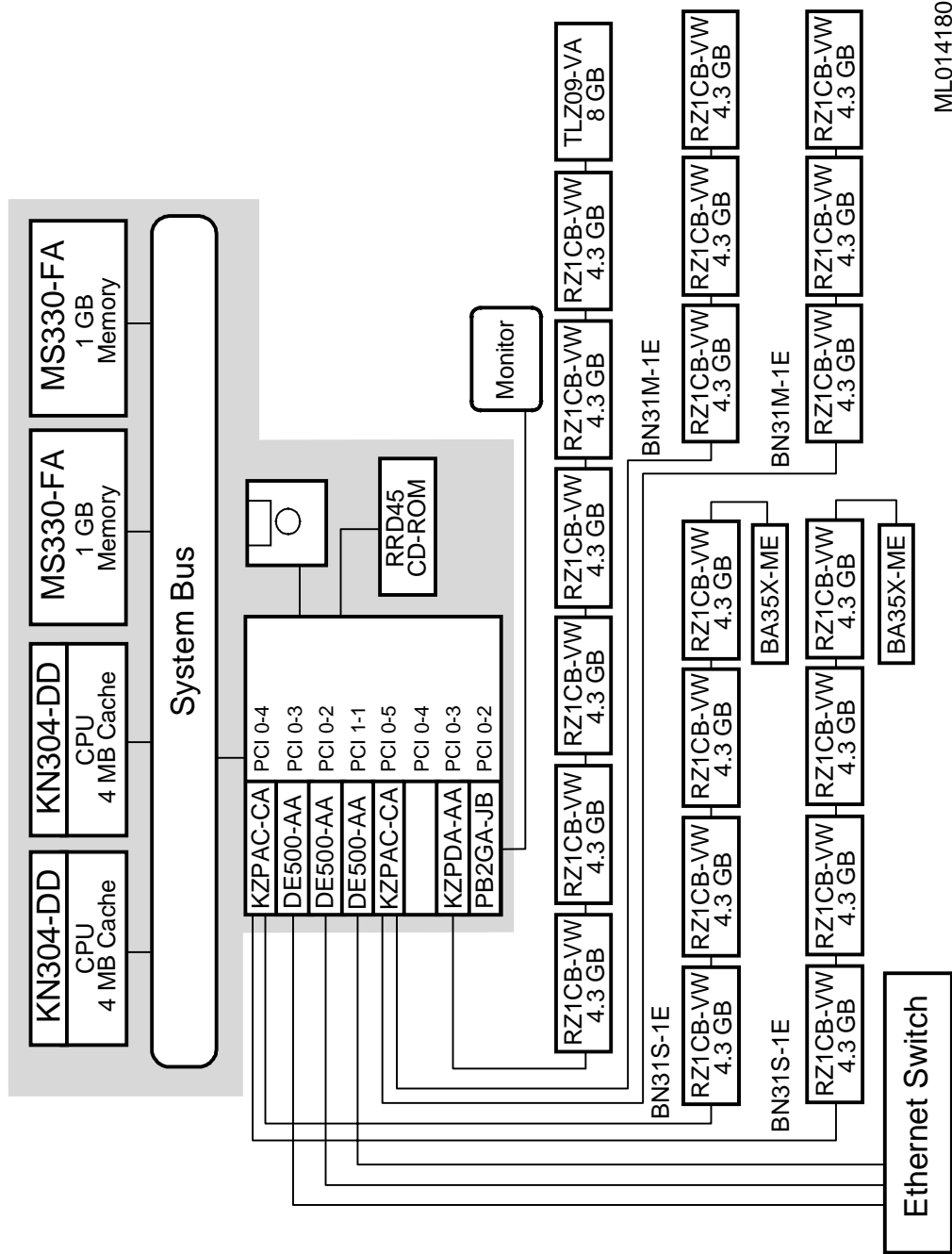
ML014180

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 System Motherboard

CPU3*
Mem1H
CPU2*
Mem1L
Mem3L*
Mem2L*
CPU1
Mem0H
Mem3H*
Mem2H*
CPU0
Mem0L
IOD01

ML014047
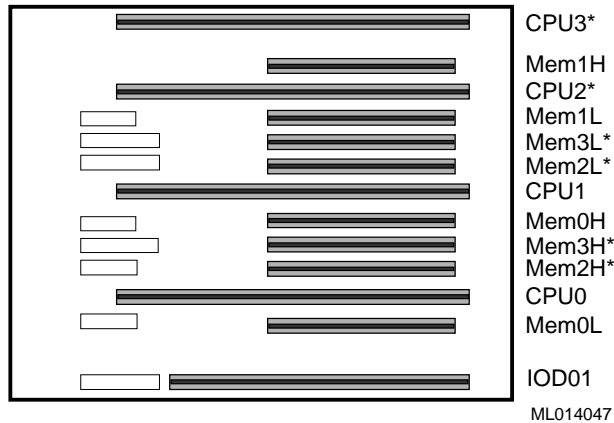
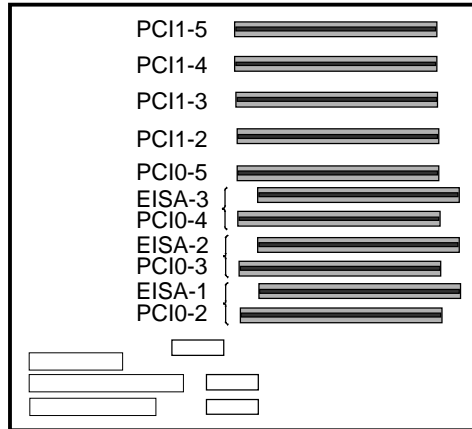*These slots do not exist on the AlphaServer 4000.

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	5/466 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	5/466 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 shows the PCI slot usage for the minimum and maximum configurations of this HiTest Template.

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	KZPAC-CA	PCI RAID controller
PCI1-4	DE500-AA	DE500-AA	Ethernet adapter
PCI1-3	open	DE500-AA	Ethernet adapter
PCI1-2	open	DE500-AA	Ethernet adapter
PCI0-5	open	KZPAC-CA	PCI RAID controller
EISA-3/ PCI0-4	open	open	–
EISA-2/ PCI0-3	KZPDA-AA	KZPDA-AA	SCSI host adapter
EISA-1/ PCI0-2	Video	Video	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 degree)	Controller Board	Personality Module (JA1)*
BN31M-1E	2	External 1.5-Meter 16-Bit SCSI-2 Cable (straight)	Controller Board	Personality Module (JB1)*
* See *StorageWorks™ Solutions BA356-SB 16-Bit Shelf User's Guide* (Part Number EK-356KB-UG).				

Storage Configuration

Figure A-4 shows the slot layout for the BA356 storage shelves.

Figure A-4: BA356 Storage Shelves

CXO-4319A-MC
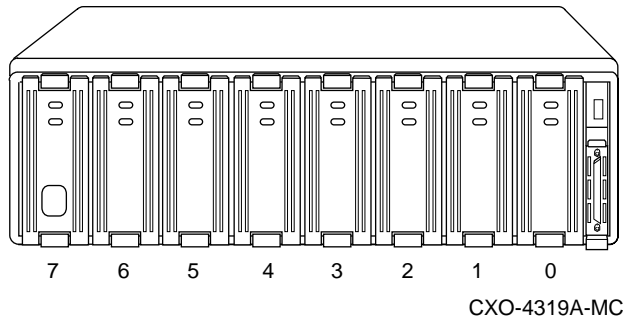
Minimum Configuration

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	RZ1CB-VW	Windows NT, Paging and log files
1	RZ1CB-VW	Lotus Domino mail data
2	RZ1CB-VW	Lotus Domino WWW data
3	RZ1CB-VW	File Shares
4	RZ1CB-VW	Log files
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	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	Lotus Domino Mail	(RAIDset member)
1	RZ1CB-VW	Lotus Domino WWW	(RAIDset member)
2	RZ1CB-VW	Lotus Domino Mail	(RAIDset member)
3	RZ1CB-VW	Lotus Domino WWW	(RAIDset member)
4	RZ1CB-VW	Lotus Domino Mail	(RAIDset member)
5	RZ1CB-VW	Lotus Domino WWW	(RAIDset member)
6	RZ1CB-VW	Lotus Domino Mail	(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	Lotus Domino Mail	(RAIDset member)
1	RZ1CB-VW	Lotus Domino WWW	(RAIDset member)
2	RZ1CB-VW	Lotus Domino Mail	(RAIDset member)
3	RZ1CB-VW	Lotus Domino WWW	(RAIDset member)
4	RZ1CB-VW	Lotus Domino Mail	(RAIDset member)
5	RZ1CB-VW	Lotus Domino WWW	(RAIDset member)
6	RZ1CB-VW	Lotus Domino Mail	(RAIDset member)
7	Power supply	Power supply	