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Lotus Domino
Windows NT AlphaServer 800

DIGITAL HiTest Notes

Part Number: EK-HLDNF-HN. C01

February 1998

Revision/Update Information: This is a revised document.

Digital Equipment Corporation
Maynard, Massachusetts

February 1998

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Preface

This document provides an overview of DIGITAL HiTest Suites and detailed technical information about the Lotus Domino Windows NT AlphaServer 800 HiTest Suite. This information includes the HiTest AppSet, the HiTest Foundation, configuration details, installation instructions, tuning parameters, problems encountered and their solutions, tests and test results, and system diagrams. Together, a HiTest Foundation and HiTest AppSet (Application Set) comprise all of the components in a HiTest Suite. The HiTest Foundation includes the hardware, operating system, middleware, and database software. The HiTest AppSet contains a collection of software specific to one class of customer solutions.

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.

Organization

This document is organized as follows:

Chapter Title	Description
Chapter 1 – Advantages of DIGITAL HiTest Suites	Provides a summary of the benefits of DIGITAL HiTest Suites and an overview of the Suite covered in this document.
Chapter 2 – About This DIGITAL HiTest Suite	Describes the specific characteristics of this HiTest Suite.
Chapter 3 – Configuration Data	Includes tables of configuration data about the hardware and software components that define the DIGITAL HiTest Template, and special configuration rules if any.
Chapter 4 – System Installation and Setup	Provides information for installing and setting up this DIGITAL HiTest Suite.
Chapter 5 – Tests and Results	Describes how the tests were set up including database organization, where data and programs were placed, and how the tests were run. It also describes system limits and characterization data.
Chapter 6 – Problems and Solutions	Discusses any problems and solutions that were discovered during testing.
Chapter 7 – Detailed Hardware Configuration	Contains more detailed information about the configuration of the hardware and software components listed in the Configuration Data chapter.

Customer Feedback

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 complete document title and part number (EK-HLDNF-HN. C01) in your correspondence about this document.

Ordering Information

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

This document and other HiTest documents can be downloaded from the DIGITAL HiTest web site, which also provides access to other HiTest information such as configuration tools and parts updates.

`http://cosmo.tay.dec.com/public/configsys/config_systems.htm`

You can also visit the Technical Support Center web page, which provides additional information such as pointers to benchmark centers and major technical training and events:

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

Related Documents

This document references the following manuals:

- *AlphaServer 800 Owner's Guide* (order number EK-ASV80-UG)

  This document is available in PostScript (.ps) and Adobe PDF (.pdf) formats. Both formats can be accessed from the DIGITAL AlphaServer 800 web site at:
  `http://www.digital.com/info/alphaserver/tech_docs/alphasrv800/`

  Choose AlphaServer Owner's Guide from the list of documentation.

- *AlphaServer 800 Technical Summary*

  This document is available in HTML, PostScript (.ps) and Adobe PDF (.pdf) formats. All formats can be accessed from the DIGITAL AlphaServer 800 web site at:
  `http://www.digital.com/info/alphaserver/tech_docs/alphasrv800/`

  Choose AlphaServer Technical Guide from the list of documentation.

- *RAID Arrays 230/Plus Subsystem RAID Configuration Utility User's Guide* (order number AA-R07GA-TE)

  This document is provided with the PCI three-port RAID controller (KZPAC-CA).

- *Prioris XL 6000 Quick Reference Guide* (order number ER-B60WW-SR)

  This document is provided with the Prioris XL 6200 system.

The following documentation is provided with the respective software:

- *Microsoft Windows NT Server Start Here (Basics and Installation)*
- *Microsoft SQL Server Setup Guide*
- *Microsoft SQL Server Administrator's Companion*
- *Microsoft Systems Management Server for Windows NT Administrator's Guide*

1
Advantages of DIGITAL HiTest Suites

This chapter describes what a HiTest Suite is, the suite components and advantages, and customer add-ons.

What Is a DIGITAL HiTest Suite?

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, the internet and intranet servers segment, and the mail and messaging servers segment.

In each HiTest Suite, the components are selected and the configurations designed to ensure system reliability, application performance, and ability to upgrade. The suite's hardware and software components have been successfully tested for interoperability.

The specifications for allowed ranges of hardware and software components, part numbers, description, and revision information are listed in the *DIGITAL HiTest Template* in Chapter 3.

DIGITAL HiTest Suite Components

The Lotus Domino Windows NT AlphaServer 800 HiTest Suite contains three groups of components: the *DIGITAL HiTest AppSet*, the *DIGITAL HiTest Foundation*, and the *System Management Station*.

The DIGITAL HiTest AppSet contains application software unique to the targeted market. The DIGITAL HiTest Foundation contains the operating system, middleware, database software, and hardware and can be used as a configuration guideline for the base platform for many applications and target markets. The System Management Station is an optional standalone personal computer system containing software used to manage the HiTest system.

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.

Additional Hardware and Software

Besides the hardware and software specified in a DIGITAL HiTest Suite, additional hardware and software can be added to a HiTest System. Add-on hardware consists of accessory components such as printers, modems, and scanners that are supported by the operating system and other software. Adding these components should not affect interoperability and, therefore, the system can still be considered a DIGITAL HiTest System.

Customers who purchase a DIGITAL HiTest System that is configured below the maximum specified in the Template, can later add additional hardware up to the specified maximum range and still maintain the integrity of a DIGITAL HiTest System.

If additional hardware components beyond the maximum specified in the Template are configured into a system, you still have the assurance that the rest of the system has been thoroughly tested for component interoperability. Therefore, the risk of experiencing problems is greatly reduced.

2
About This DIGITAL HiTest Suite

This HiTest Suite satisfies the needs of customers who require a full function office automation system for the workgroup or small department.

Lotus Development Corporation's Domino Server provides groupware and electronic mail for corporate users with the ability to integrate the Internet with the Intranet. It is an applications and messaging server with an integrated set of services to easily create secure, interactive business solutions for the Internet, corporate intranets, and extranets. Users rapidly build, deploy, and manage applications to handle critical business online.

The DIGITAL AlphaServer 800 system provides high performance at a low price for today's demanding communications applications. This powerful yet affordable server offers leadership mail and messaging performance. Its Internet capabilities and integrated remote management also make it the perfect choice as a branch or remote site server.

The Lotus Domino Windows NT AlphaServer 800 HiTest Suite includes the following components:

- Domino Server
- Windows NT Server
- AlphaServer 800
- UltraSCSI storage

This chapter describes the following characteristics of the Lotus Domino Windows NT AlphaServer 800 HiTest Suite and evaluates the Suite in terms of each:

- Availability
- Installability
- Interoperability
- Manageability
- Price Range
- Scalability
- Services
- Year 2000 Compliance

Availability

Availability, which describes a computer system's ability to recover from a failure, can be described in terms of the following:

- Data Protection – Ensures long-term data accessibility by providing the facility to do offline data backup.
- Data Availability – Stores redundant data online for rapid, automatic data recovery in the event of a failure. Data availability is typically provided through the use of RAID technology.
- Platform Availability – Enables processing to continue during failure by using technologies that support failover to other components. Clustering, redundant power supplies, battery backup, and other components provide support for platform availability.
- Disaster Tolerance – Protects against computer room disasters such as fire, flood, and sabotage. Disaster Tolerant Systems require an additional system at a remote site and are more expensive than the previously defined alternatives. (The DIGITAL HiTest process does not test disaster tolerant configurations. If disaster tolerance is a requirement, your sales person can provide more information.)

Features of Lotus Domino Windows NT AlphaServer 800 HiTest Suite

The DIGITAL HiTest process verified that each of the availability features provided by this Suite operate correctly and provide the protection required for all configurations.

Table 2-1 indicates availability features that are always included in this HiTest Suite when configured with the AppSet and those that the customer may choose to include.

Table 2-1: Lotus Domino Windows NT AlphaServer 800 Availability Features

Availability Feature	Enabling Technology	Always Included	Customer Optional
Data Protection	Backup and restore	Yes	
Data Availability	Redundant disk storage (RAID)		Yes

Recommendations for Lotus Domino Windows NT AlphaServer 800 HiTest Suite

This HiTest Suite provides high availability while maintaining high performance and low cost. Hardware with a high mean-time-between-failures (MTBF) is used. An option for redundant data storage assures data availability. To reduce the risk of system failures, DIGITAL recommends that the following levels of availability features be considered for this HiTest Suite:

- Data Protection
  - Long term data accessibility is always provided with this HiTest Suite by a 4/8 GB DAT tape drive, which provides up to 8 GBs of compressed data storage.
- Data Availability
  - When high data availability is not a concern, disks may be configured as just a bunch of disks (JBOD) or RAID 0, providing storage capacity between 2.1 GB and 12.9 GB.
  - When two drive are use for data and high availability is required, DIGITAL recommends the use of RAID 1.

- When three drives are used for data and high availability is required, DIGITAL recommends the use of RAID 5.

A minimum configuration with one data disk configured as JBOD and a maximum configuration with three data disks configured as RAID 5 were tested in the HiTest environment.

Understanding Availability Features

This section provides background information on the availability features included in this HiTest Suite.

Backup and Restore

Backup and restore ensures that data remains available from one day to the next. It is generally identified as a *data protection* technique because the stored information can also be removed to a remote, protected environment. DIGITAL offers a range of backup and restore capabilities from individual tape systems to automated tape libraries.

Disk Storage Technologies

This section describes the disk storage technologies used to provide availability for DIGITAL HiTest configurations.

Just a Bunch of Disks (JBOD)

Just a bunch of disks (JBOD) refers to a multiple disk drive configuration, internal or external to a host computer, in which there is no storage controller. Disk drives are managed by the host system. To increase availability, JBOD storage systems are often configured with hardware such as redundant power supplies and fans, or multiple SCSI buses.

Redundant Array of Independent Disks (RAID)

A Redundant Array of Independent Disks (RAID) is a collection of disks managed by specialized array management software. When using RAID, all disks in the RAIDset should be the same type. Array management software may be *host-based* (execute in the host computer) or *subsystem-based* (execute in an intelligent disk controller).[1]

Disk striping (RAID Level 0), is technically not RAID because it does not offer redundancy.

RAID Levels 2 and 3 are parallel access arrays (members are accessed concurrently). To ensure that all disks participate in every I/O request, the minimum chunk size is kept small (for example, a byte).

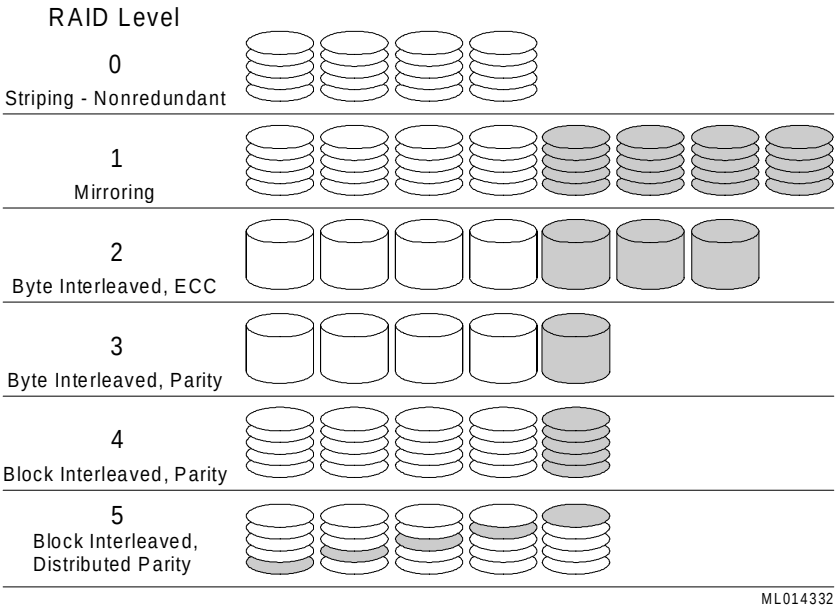
RAID Levels 4 and 5 are independent access arrays (members are not required to be accessed concurrently). By keeping the minimum chunk size at least as large as a disk sector (block), not all members have to participate in each I/O request.

RAID Levels 2 and 4 are not in general use.

[1] The RAID technique was described by D. A. Patterson, G. Gibson, and R. H. Katz “A Case for Redundant Arrays of Inexpensive Disks (RAID),” Report No. UCB/CSD 87/391, University of California, Berkeley CA 1987.

Figure 2-1 summarizes RAID levels. The shaded areas in Figure 2-1 refer to space used for redundancy features.

Figure 2-1: RAID Level Summary



DIGITAL and other companies also use the terms RAID 0+1, RAID 1+5 and Adaptive 3/5 to refer to the combinations of these, and other, storage technologies. Table 2-2 describes the RAID types to consider when choosing a RAID configuration.

Table 2-2: RAID Levels and Descriptions

RAID Level	Description	Advantages/Disadvantages
0	• Striping • Data segmented and distributed across several disks	+ increase in performance due to parallelism in read and write - no fault tolerance (*not* a high availability solution)
1	• Hardware Mirroring • Data written twice to different disk spindles within the disk array	+ good performance in read-intensive applications (data can be read in parallel from several disks) - slower in writes (multiple writes required) - spindle costs doubled
0+1	• Striped Mirroring • Combined level 0 and 1 • Data mirrored onto and striped across several disks • Best for performance-critical, fault-tolerant environments	+ good performance in reads (RAID 1) + write performance improved versus RAID 1 due to parallelism + adequate response maintained in event of disk failure - spindle costs doubled - recovery is I/O intensive
2	• Parallel access array • Striped • ECC on separate drives	+ high data transfer rate + ECC detects and corrects errors - low I/O request rate - not appropriate with modern drives

RAID Level	Description	Advantages/Disadvantages
3	• Parallel access array • Small minimum chunk size • Check bit calculated from data • Parity bits on dedicated disk, data striped across remaining disks	+ good performance in reads due to parallelism (like RAID 0) + costs only slightly increased compared to disks without high availability solutions + good performance with long records (high data transfer rate) - write performance penalty due to check bit calculation - cannot overlap I/O (low I/O request rate)
4	• Independent access array • Parity disk	+ processes multiple requests simultaneously - parity disk is a bottleneck on writes
5	• Independent access array • Parity Bit • Check bit and data distributed (striped) across multiple disks • Best in environments that are mostly read and are not performance sensitive	+ good performance in reads due to parallelism (like RAID 0) + costs only slightly increased compared to disks without high availability solutions + overlapped I/O - write performance penalty due to check bit calculation
1+5	• RAID 5 combined with mirroring • Mirroring provided by LSM or Volume Shadowing • Most reliable and highest performance solution	+ good performance in reads due to parallelism (like RAID 0) + double redundancy makes disk failure barely noticeable - spindle costs more than double - write performance penalty due to check bit calculation
Adaptive 3/5	• The best features of 3 and 5 • Adapts between Level 3 and Level 5 in response to changes in the application's workload	+ good performance in reads due to parallelism (like RAID 0) + costs only slightly increased compared to disks without high availability solutions + performs well with a wide variety of I/O loads even when load characteristics change minute by minute. - write performance penalty due to check bit calculation

Installability

Installability is the ease with which hardware and software components can be installed and configured for use. Factors that are considered when evaluating installability include clarity of installation steps, number of steps and duration appropriate to the complexity of the product, and completeness of the installation and configuration information.

The DIGITAL HiTest process thoroughly examined all aspects of the installation of this HiTest Suite. The installation procedures that were used are documented in Chapter 4.

No problems were found with either the hardware or software installation.

Within the HiTest environment, after removing the system from the shipping skid, it required less than one hour to install and configure the hardware for the minimum configuration and approximately four hours to install and configure the hardware for the maximum configuration. Installation and configuration of the software took less than an hour. Expect installation times to vary significantly in other environments depending on factors such as the expertise of the installer and the environment in which the installation occurs.

DIGITAL Multivendor Computer Services (MCS) offers expert installation services.

Interoperability

Major components of this HiTest Suite have been tested for interoperability, including the application, operating system, hardware, firmware, and service packs and patches. Since interoperability problems are often related to inappropriate versions of components, the specific versions that are known to interoperate are documented. Minimum and maximum configurations for this Suite have been tested. The specific processes used for testing this Suite are described in Chapter 5.

The HiTest Notes provide solutions to interoperability problems in several ways. First, specific versions of all components are documented in Chapter 3. Second, installation and setup instructions in Chapter 4 are written so that many interoperability problems are avoided. Third, potential problems and solutions are documented in Chapter 6.

There are no major interoperability issues in this Suite.

Manageability

System manageability is the ease with which a system is managed or controlled. Because a system is composed of many components, manageability is described according to which component (application, operating system, server, storage) of the system is being controlled. For each of those components, manageability is measured by five features:

- Administration – The ease with which the systems management tools manage the system components
- Alarms – The effectiveness of triggers at detecting problems in system components
- Performance – The tuning and monitoring of system components
- Security – File access, user access, and intrusion detection
- Accounting – Logging the use of system resources

While system management is optional for the Lotus Domino Windows NT AlphaServer 800 HiTest Suite, DIGITAL has specified the best system management solution in Chapter 3. Table 2-3 summarizes the manageability features that this solution provides.

Table 2-3: Lotus Domino Windows NT AlphaServer 800 Manageability Features

	N/A	Admin.	Alarms	Performance	Security	Accounting
Application	N/A					
Operating System		Yes	Yes	Yes	Yes	
AlphaServer		Yes				
Storage		Yes	Yes	Yes		

During the DIGITAL HiTest process, System Management Server and SQL Server were used to manage the systems. The system management station does not provide for remote management of the application.

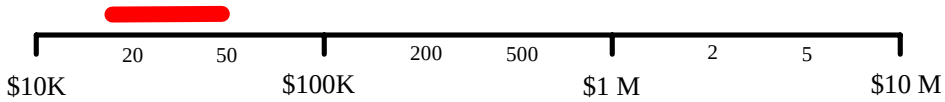
No manageability problems were identified.

Price Range

Figure 2-2 shows the approximate list price (U.S. dollars) for the minimum and maximum HiTest Systems that can be configured from the Lotus Domino Windows NT AlphaServer 800 HiTest Suite. These prices were effective as of December 12, 1997. The price range can vary significantly over time and with the inclusion of service packages, consulting, country-specific prices, and other factors.

The DIGITAL AlphaServer 800 system provides high performance at a low price for today's demanding communications applications. Systems configured from this HiTest Suite make powerful yet affordable office automation servers for the workgroup or small department. The latest Windows NT Server pricing makes AlphaServer 800 a logical extension of the DIGITAL Intel line of NT servers for the incremental performance it provides.

Figure 2-2: Lotus Domino Windows NT AlphaServer 800 Price Range



The purchase price of a system is only one factor affecting affordability. The cost of staff, space, maintenance, and upgrade also affect the total cost of ownership. The system value is determined by comparing these costs to the total benefit and deriving the return on investment (ROI). Because these costs and the benefits are unique to each customer, the ROI can best be determined by a joint customer and sales person team.

Scalability

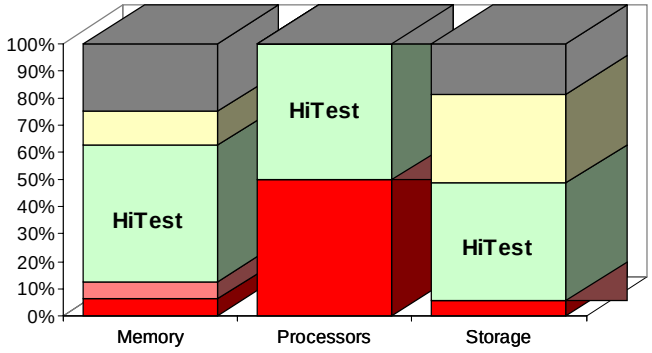
For this HiTest Suite, scalability can be described in two ways. In terms of hardware, scalability refers to the additional hardware components that can be added to a system within and beyond the HiTest configuration. In terms of performance, scalability refers to the workload capability of the HiTest configuration.

Additional Hardware Components

Systems that are configured from this HiTest Suite can easily be upgraded both within and beyond the ranges specified in the Suite.

In Figure 2-3, hardware scalability for this Suite is illustrated in terms of memory, number of CPUs, and disk space. Within the limits set for the enclosures called for in this HiTest Suite, comparisons are shown for the minimum and maximum limits of the system configuration.

Figure 2-3: Lotus Domino Windows NT AlphaServer 800 HiTest Suite Scalability



Systems configured within this range involve tradeoffs between these, and sometimes other components.

Systems configured within this range generally exceed the requirements of the market.

HiTest

Systems configured within this range meet the requirements of most customers.

Systems configured within this range are generally insufficient to meet the requirements of the market.

Systems cannot be configured in this range.

The AlphaServer 800 configurations of the Lotus Domino Windows NT HiTest Suite meet the requirements for workgroup or small department installations while providing memory and storage expansion capability for situations that may reach beyond the scope of this HiTest Suite.

In general, systems can be configured beyond the limits illustrated in Figure 2-3 by adding additional storage cabinets and other peripherals. While this HiTest configuration supports disk storage that completely fills the system cabinet, the AlphaServer 800 can be configured with additional storage cabinets that go well beyond this limit. This capability provides hardware scalability for users who want to go beyond the HiTest limit.

Workload Capability

Scalability also measures how performance is affected as additional resources and users are added. When scalability is measured by workload capability, the factors that are considered include the effectiveness of additional hardware; whether the system remains consistent as you add to it; and how expensive it is to add to it.

DIGITAL HiTest Suites are selected to provide an appropriate workload capability for the target application area. Often a choice of suites is available, each providing appropriate coverage for specific situations. HiTest works closely with other DIGITAL groups to ensure that a HiTest system will perform appropriately in a production environment. Many HiTest systems are tested and tuned for performance.

Characterization tests performed for Mail, Mail and Shared Database, and Groupware B users showed high performance compared to competitive systems. These results are documented in the "AlphaServer 800 5/500 Lotus Domino R4.52B for NT NotesBench: Audit Report" that is available from the NotesBench Consortium, at: `http://www.notesbench.org.`

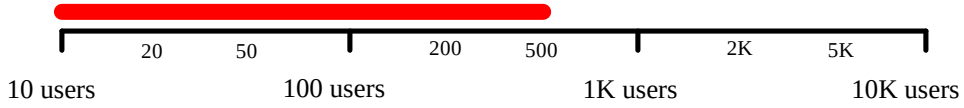
The report shows that as many as 2000 *Mail-only users* may be supported on a suitably configured AlphaServer 800.

The audit report includes the information required to compute everyday workload capability based on a realistic mix of work. A typical business mix is 60% Mail only, 30% Mail and Shared Database (Mail DB), and 10% Groupware B. Using this mix, and allowing for uneven workloads, a maximally configured HiTest system will support approximately 300 total users in a RAID 5 disk configuration. Should you choose not to use the data availability features, the same configuration will support approximately 500 total users in a RAID 0 disk configuration.

Although a larger user base may be supported by adding memory and disk space beyond the HiTest Range to the AlphaServer 800, DIGITAL recommends that the HiTest Suites using the AlphaServer 1200 or AlphaServer 4100 be considered for larger user populations.

Figure 2-4 shows the workload capability.

Figure 2-4: Lotus Domino Windows NT AlphaServer 800 Workload Capability



Benchmark data on other DIGITAL systems running Domino Server is available from the Notesbench Consortium.

Services

DIGITAL offers a range of service options. The following portfolio of Business Critical Services is available for HiTest Suites and is backed by the DIGITAL Uptime Guarantee.

Proof of Commitment: The DIGITAL Uptime Guarantee

The DIGITAL Uptime Guarantee is a formal contract that commits DIGITAL to keeping a client's business critical systems in operation at least 99.5% of the time, excluding outages beyond the control of DIGITAL, such as electrical shutdowns, environmental failures, and downtime caused by application failure. If uptime levels are lower than 99.5%, clients do not pay the full service charge.

Portfolio of Business Critical Services

The three vital elements of DIGITAL Business Critical Services are:

- Availability Review

  The first step in initiating a Business Critical engagement with DIGITAL is a customized, in-depth availability analysis of the computing environment, beginning with an overview of operating goals. This review identifies potential risks and trouble spots in hardware, software, operations, physical environment, and network. A comprehensive written report forms the basis for determining serviceability requirements.

- Business Critical Gold Support

  Clients who purchase Business Critical Gold Support work with a named technical account manager who serves as the single point of contact and ensures that problems are resolved quickly. A privileged hotline assures crisis response within 30 minutes. An assigned support team works with the account manager to apply continuous effort to critical problems. The on-site support agreement for Gold Support Customers provides coverage 24 hours a day and seven days a week. Additional benefits include:

  - Notification of software patches as soon as they become available
  - Notification of known problems and fixes
  - Monthly service activity review
  - Operating system upgrade impact planning
  - Bi-annual System Healthcheck assessments. These are conducted using advanced system-based tools to assess the performance and security of systems. The collected data is analyzed against accepted practices, and the findings, together with recommendations for corrective action, are documented in a summary report.

- Availability Partnership

  With Availability Partnership, system availability is maintained at the required level by measuring and analyzing actual system availability, and conducting regular updates to the original Availability Review. Particular focus is placed on:

  - Configuration and topology documentation
  - Availability status reporting
  - Change impact analysis
  - Proactive problem avoidance based on proactive patch/FCO/firmware management
  - Periodic detailed data collection and analysis
  - Availability model update
  - Contingency planning
  - Service planning and advising

Complementary Support Services

The three key Business Critical Services are augmented by:

- On-Site Parts Service

  DIGITAL works with the client to determine the appropriate inventory levels for their environment. A cost-effective *rental* parts solution is developed to maintain an on site inventory of spare parts.

- Installation and Startup

  DIGITAL offers rapid, worry-free implementation of new hardware and software – including systems, PCs, terminals, workstations, networking components, operating systems, layered products, applications, and software updates. Clients can choose hardware installation, software installation and startup, or both.

Meeting Client Needs Locally or Globally

With 450 service center locations in l00 countries, DIGITAL is prepared to deliver consistent and comprehensive service capabilities on a local or multinational basis. These services encompass:

- Total system support for servers, network operating system, applications, switching components, and PCs
- Multivendor support for a diverse range of products including networking equipment, applications, and peripherals
- Microsoft Solution Provider and Authorization Support Centers with the largest concentration of Microsoft certified engineers in the world

For More Information

To find out more about DIGITAL Business Critical Services, contact your local DIGITAL Multivendor Customer Services sales specialist or visit the Business Critical Services web site at `http://www.digital.com/services/mcs/mcs_critical.htm`.

Year 2000 Compliance

Year 2000 Compliance refers to whether computer systems will properly recognize the date change from December 31, 1999 to January 1, 2000. Current information on Year 2000 status of DIGITAL products can be obtained from the DIGITAL Year 2000 Program web site at `http://ww1.digital.com/year2000/`. Current information on the Year 2000 status of other vendor's products should be confirmed with those vendors.

While HiTest does not explicitly test for Year 2000 compliance in the components of this Suite, HiTest does check the published status of components where Year 2000 compliance would be a concern. The Year 2000 information presented here is accurate as of January 15, 1998. Table 2-4 summarizes these findings.

The color codes used in the table represent the following categories of readiness:

- Blue – Version specified is Year 2000 ready today.
- Green – Currently not Year 2000 ready. Version to be Year 2000 ready specified with Year 2000 date noted.
- Yellow – Under evaluation.
- Red – Will not be made ready for Year 2000. Product will be removed from active status on or before 31 March 1998.
- N – Not Applicable. No Year 2000 implications exist for this component.

Table 2-4: Lotus Domino Windows NT AlphaServer 800 Year 2000 Compliance

Component	Year 2000 Status
Domino Server	Blue
Windows NT Server	Blue
AlphaServer 800	Blue
UltraSCSI Storage	N

3
Configuration Data

This chapter describes the Lotus Domino Windows NT AlphaServer 800 DIGITAL HiTest Suite including the hardware, software, and firmware components and their revision levels. If required, special configuration rules are explained.

Hardware and Software Components

Table 3-1 identifies the range of hardware and software components that can be configured using the Lotus Domino Windows NT AlphaServer 800 HiTest Suite. This is the DIGITAL HiTest Template. The ranges of hardware provided in this template include 128 MB through 640 MB of memory, two 2.1 GB disk through four 4.3 GB disks, one or two Fast Ethernet controllers, 0 or one RAID controller, and a 4/8 GB DAT tape drive.

Table 3-2 lists the optional system management station hardware and software.

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

The DIGITAL HiTest Template consists of three categories:

- AppSet Software – Consists of software specific to one class of customer solutions, in this case Domino Server.
- Foundation Hardware – Includes the base system, storage, and other hardware options.
- Foundation Software – Consists of the operating system software.

When ordering an item from a HiTest Template, select a quantity that is within the minimum and 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, order at least the minimum quantity, but be cautious about exceeding 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 Chapter 7.

Table 3-1: Lotus Domino Windows NT AlphaServer 800 HiTest Template

Lotus Domino HiTest AppSet Window NT AlphaServer 800 HiTest Foundation				
For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.digital.com:9003/cgi-bin/comet				
Line Item	**Description**	**Part Number**	**HiTest Range**	
			Min	**Max**
AppSet Software				
1	**Domino Server 4.6** Contact Lotus at: `http://www2.lotus.com/` **Note:** This AppSet is not required when the foundation hardware and software is ordered for use with a non-HiTest application.	**Lotus**	1	1
Foundation Hardware				
2	*Select one base system:* **AlphaServer 800 5/400 System, Pedestal, 128 MB** **AlphaServer 800 5/400 System, Pedestal, 256 MB** **AlphaServer 800 5/400 System, Rackmount, 128 MB** **AlphaServer 800 5/400 System, Rackmount, 256 MB** *Hardware includes*: • CPU with 2 MB cache • Memory as indicated above • S3 SVGA integrated Graphics • DE500-AA 10/100 Mbit Fast Ethernet • Qlogic ISP1020 Integrated SCSI controller and cable • SCSI 12X CD-ROM drive • RX23L-AB 1.44 MB Floppy drive • 4.3 GB UltraSCSI disk (RZ1CB-SB) **Note:** Systems ordered in the Americas or Asia Pacific include the keyboard. *Software includes*: • Windows NT Server 4.0 operating system • 10-client access license and media	**PB81B-AN**ⓘ **PB81B-AT**ⓘ **PB81P-AN**ⓘ **PB81P-AT**ⓘ	1	1
3	**128 MB Memory Option** **256 MB Memory Option** **512 MB Memory Option** **Note:** This HiTest template supports a memory range from 128 MB to 640 MB. When selecting memory options, stay within the template's 640 MB maximum.	**PB8MA-AD** **PB8MA-AE** **PB8MA-AF**	0	See Note
4	**PCI three-port UltraSCSI RAID Controller, 4 MB cache**	**KZPAC-CA**	0	1
5	**SCSI-2 RAID controller cable**	**PB8HA-DA**	0	1
6	*Select either:* **4.3 GB 7200 RPM UltraWide SCSI Disk Drive** **2.1 GB 7200 RPM UltraWide SCSI Disk Drive** **Note:** Either 4.3 GB disks or 2.1 GB disks can be used in the quantities shown.	**RZ1CB-SB** **RZ1BB-SB**	1	3
7	**4/8 GB DAT Tape Drive**	**TLZ09-LK**	1	1
ⓘ Indicates that geography-specific part number variants are available. Check the appropriate price book for details.				

Lotus Domino HiTest AppSet
Window NT AlphaServer 800 HiTest Foundation

For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.digital.com:9003/cgi-bin/comet

Line Item	Description	Part Number	HiTest Range Min	HiTest Range Max
8	*Select one high-resolution monitor*: **15" Flat-square with 0.28 dot pitch** **17" Trinitron aperture grille, 0.28 dot pitch** **21" Diamondron aperture grille, 0.29 dot pitch**	**SN-VRCX5-WA**ⓘ **SN-VRTX7-WA**ⓘ **SN-VRCX1-WA**ⓘ	1	1
9	**System Management Station**	**See Table 3-2**	0	1

ⓘ Indicates that geography-specific part number variants are available. Check the appropriate price book for details.

Foundation Software

Line Item	Description	Part Number	Required by
10	**Windows NT Server 4.0**	**Included with Item 2**	F, A†
11	**Windows NT Service Pack 3 (SP3)** Contact Microsoft at `http://www.microsoft.com` or (800) 360-7561. Or: download from: `ftp://ftp.microsoft.com/bussys/winnt`	**Microsoft**	F, A†
12	**Hard copy of this Suite's HiTest Notes**	**EK-HLDNF-HN**	F, A†

† F = Foundation, A = Application

Table 3-2: System Management Station Template

Lotus Domino HiTest AppSet System Management Station				
For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.digital.com:9003/cgi-bin/comet				
Line Item	**Description**	**Part Number**	**HiTest Range**	
			Min	**Max**
Management Station Hardware				
Note: This HiTest Suite supports the use of a system management station. When the management station option is included, this HiTest Template identifies the items required. When system management is provided through other means, this option may be omitted without invalidating the HiTest Suite.				
1	**Prioris XL 6200 Server** *Hardware includes*: • 200 MHz CPU with 256 KB cache • 32 MB memory • Integrated Fast Ethernet (10/100) • Integrated Cirrus PCI graphics controller (with 512 KB) • 12X CD-ROM • Integrated UltraWide SCSI controller • 2.0 GB disk drive • 1.44 MB floppy **Note:** A functionally equivalent 80x86 system may be substituted without invalidating this HiTest Template. *Software includes*: • ServerWORKS	**FR-B60WW-XD**	1	1
2	**Country kit, North American**	**FR-PC94K-AA** ❶	1	1
3	**32 MB 60 ns EDO DIMM Memory**	**PR-PCXAG-AQ**	1	1
4	*Select one high-resolution monitor*: **21” (19.6 view) 1600 x 1200 @75Hz** **19” (18” view) 1600 x 1200 @75Hz** **17” (16” view) 1280 x 1024 @75Hz**	**FR-PCXAV-WZ** ❶ **FR-PCXAV-TZ** ❶ **FR-PCXAV-YZ** ❶	1	1
❶ Indicates that geography-specific part number variants are available. Check the appropriate price book for details.				
Software Installed on Management Station				
5	**Windows NT Server 4.0** Contact Microsoft at: `http://www.microsoft.com` or (800) 360-7561.	**Microsoft**	1	1
6	**Window NT Service Pack 3 (SP3)** Contact Microsoft at `http://www.microsoft.com` or (800) 360-7561. Or: download from: `ftp://ftp.microsoft.com/bussys/winnt`	**Microsoft**	1	1
7	**Systems Management Server (SMS) Version 1.2** Contact Microsoft at: `http://www.microsoft.com` or (800) 360-7561.	**Microsoft**	1	1
8	**Systems Management Server Service Pack 1 (SP1)** Contact Microsoft at `http://www.microsoft.com` or (800) 360-7561. Or: download from: `ftp://ftp.microsoft.com/bussys/winnt`	**Microsoft**	1	1
9	**SQL Server Version 6.5** Contact Microsoft at: `http://www.microsoft.com` or (800) 360-7561.	**Microsoft**	1	1

Lotus Domino HiTest AppSet System Management Station				
For documentation and updates: http://cosmo.tay.dec.com and http://www.partner.digital.com:9003/cgi-bin/comet				
Line Item	**Description**	**Part Number**	**HiTest Range**	
			Min	**Max**
10	**SQL Server Service Pack 1 (SP1)** Contact Microsoft at `http://www.microsoft.com` or (800) 360-7561. Or: download from: `ftp://ftp.microsoft.com/bussys/winnt`	**Microsoft**	1	1
Software Installed on Managed System				
11	**Microsoft Systems Management Server agents for Alpha Systems** **Note:** The Intel variant of Microsoft Systems Management Server (item 7) includes both the Intel and Alpha agents.	**Included with item 7**	1	1

Table 3-3: Component Revision Levels

Hardware Component	Hardware	Firmware	Software
5/400 MHz CPU	D02	–	–
SCSI RAID Controller (KZPAC-CA)	E02	2.42	–
2.1 GB disk (RZ1BB-SB)	–	0656	–
4.3 GB disk (RZ1CB-SB)	–	0016	–
Fast Ethernet Controller (DE500-AA)	B01	1.1	–
SRM Console	–	5.0-104	–
AlphaBIOS	–	5.30	–
CD (RRD46)	–	0557	–
8 GB DAT Tape Drive (TLZ09-LK)	A02	0172	–
Software Component		**Version/Revision**	**Patch Level**
Windows NT Server		4.0 (Build 1381)	Service Pack 3 (SP3)
Domino Server		4.6 Gold	–
Systems Management Server		1.2 (Build 786)	Service Pack 1
SQL Server		6.5	Service Pack 1
EISA Configuration Utility (ECU)		1.9	–
RAID Configuration Utility (RCU)		4.73	–
RAID Manager Utility for NT		1.3	–
RAID Monitor service		1.41	–

Special Configuration Rules

When configuring the Lotus Domino Windows NT AlphaServer 800, it is possible to order more or less memory than is supported by the DIGITAL HiTest Templates. To comply with the HiTest Template, keep the total installed between 128 MB and 640 MB.

The *AlphaServer 800 Owner's Guide* provides configuration information needed to properly install memory and PCI options.

See the *AlphaServer 800 Technical Summary* for a description of the system including hardware components, server management, and maintenance.

4
System Installation and Setup

This chapter describes how to install and set up a DIGITAL HiTest System configured from this DIGITAL HiTest Suite. System preparation includes installing hardware, operating system, management station, and applications.

Hardware Installation

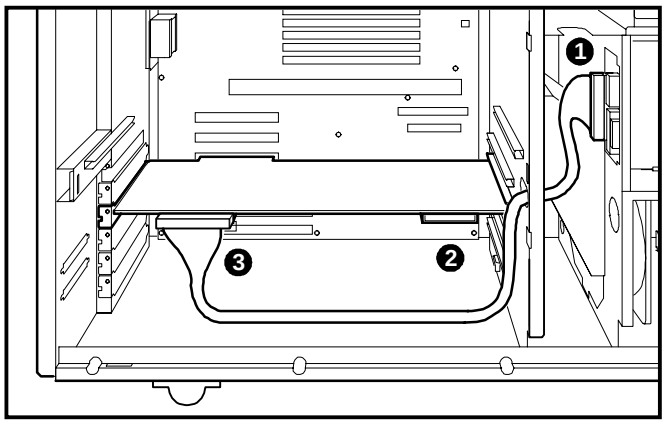
The *AlphaServer 800 Owner's Guide* provides instructions on installing your AlphaServer 800 system. Chapter 7 of this HiTest Note provides additional information specific to the minimum and maximum configurations of this HiTest Suite.

SCSI RAID Controller Installation

If you plan to use a RAID configuration and your RAID controller has not been pre-installed, use the instructions in this section to install it.

To connect the internal hard disk drives to a RAID controller option or a SCSI controller other than the onboard controller, use cable PD8HA-DA. Figure 4-1 shows the cable routing from the hard disk backplane to the storage controller option.

Figure 4-1: RAID/SCSI Cable for Internal Disk Drive Backplane



ML014333

❶ Hard disk backplane
❷ D connector on the motherboard
❸ D connector on the SCSI RAID controller

To install the SCSI RAID controller, move the D connector on the PD8HA-DA cable from the motherboard to the D connector on the SCSI RAID controller (KZPAC-CA).

System Firmware

To conform to this HiTest Suite, console firmware must be the current release SRM 5.0-104 and AlphaBIOS 5.3.

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. The firmware can also be downloaded from the Internet using the following URL:

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

On system startup, verify that the firmware levels are correct. If necessary, upgrade the firmware as follows:

1. Reboot the server.
2. When the system starts the AlphaBIOS, press the F2 key to enter Setup.
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.

Date and Time

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

SCSI RAID Controller Setup

After installing your KZPAC controller, and prior to configuring your RAID array, you must perform a one-time setup to load parameters into the controller firmware. Configure the controller using the RAID Array 230/Plus RAID Configuration Utility (RA200RCU.EXE). Refer to the *RAID Arrays 230/Plus Subsystem RAID Configuration Utility User’s Guide* provided with the PCI three-port RAID controller (KZPAC-CA) for details on using the RAID Configuration Utility and RAID.

To configure the controller:

1. Invoke the AlphaBIOS console menu.
2. Insert the RAID Array 230/Plus SW RX23 diskette into your floppy drive.
3. Run RA200RCU.EXE.
4. Choose Controller Setup from the Main Menu of the RAID Controller Utility (RCU).
5. Choose the default settings for hardware parameters, data parameters, SCSI transfer parameters, and startup parameters.
6. Press ESC to exit. If you change settings, RCU prompts you to save the altered controller configuration.

RAID Array Configuration

Configure the RAID arrays (RAIDsets) using the RAID Array 230/Plus RAID Configuration Utility described in the SCSI RAID Controller section earlier in this chapter.

DIGITAL recommends the following RAID configurations:

- When high data availability is not a concern, configure disks as just a bunch of disks (JBOD).
- When three drives are used for data and high availability is required, use RAID 5.

Follow the instructions in the *RAID Arrays 230/Plus Subsystem RAID Configuration Utility* manual to create the storage configuration you choose.

Initializing disks can be time consuming. It can take up to an hour to initialize a 4.3 GB disk. After the disk is initialized formatting requires only seconds, even for complex arrays. Estimate at least an hour per disk when planning the configuration and setup of your disks. RAID disk sets initialize much more quickly if the write policy for the RAID drives is set to *writeback.* After initialization is complete, change the write policy back to *writethrough.*

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 diskette labeled ECU Diskette V1.10 DEC Alpha 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 Installation

This section describes how to install the Windows NT Server operating system and Service Pack 3 (SP3).

Windows NT Server Installation and Configuration

The AlphaServer 800 comes with the Windows NT Server operating system installed. To configure your system:

1. Make sure you have the following information, required to complete you configuration:
   - Product key – 20-digit number that appears on your certificate of authenticity

     or CD Key – 10-digit number that appears on the CD case
   - Unique name – to identify your computer on the network
   - Workgroup/domain name
   - IP address
2. Boot the system. The configuration screen will appear.
3. Choose the “Typical” setup option and follow the prompts to configure the system. Use the defaults and provide the required information when prompted.

If the Windows NT Server operating system is not installed, or if you need to reinstall Windows NT Server, complete the following procedure:

1. Make sure you have the information in step 1 of the previous procedure.
2. Load the Windows NT Server 4.0 CD-ROM into the CD drive.

3. From AlphaBIOS Setup, select “Install Windows NT,” and press Enter.
4. Follow the prompts to complete the installation. Use the defaults and provide the requisite information when prompted.

For more information, see the *Microsoft Windows NT Server Start Here (Basics and Installation)* book, provided with your server software.

Service Pack Installation

Service packs are available from the following sources:

- A Microsoft reseller
- The Microsoft web page at: `http://www.microsoft.com`
- The Microsoft Order Desk in the United States at (800) 360-7561 between 6:30 A.M. and 5:30 P.M., Pacific time
- The Microsoft support page located at: `ftp://ftp.microsoft.com/bussys/winnt`

Install Windows NT Service Pack 3 (SP3).

Note

Windows NT Service Pack 3 (SP3) *must* be installed after installing the operating system and after installing any applications.

Domino Server Installation

To install Domino Server, refer to the Domino Server installation guide as you complete the following steps:

1. Insert the Lotus Domino Server CD-ROM and run `/lotus46A/w32alpha/install/install.exe`.
2. From the Setup Options menu, select Custom Installation.
3. From the Custom Installation menu, select the Notes Performance Monitor Component.
4. 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.
5. Ensure that the `\notes` directory is included in the path for Windows NT. Refer to the Windows NT online help for information.
6. 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
   ```

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

Management Station Installation

If you have selected a System Management Station, use the instructions in this section to install and configure the hardware and software on the management station and the software on the system being managed.

Hardware Installation

Connect your system as shown in the *Prioris XL 6000 Quick Reference Guide*, provided with your Prioris XL system.

Software Installation

This section describes how to install the System Management Station software, including the Windows NT Server operating system, SQL Server, Systems Management Server (SMS), and the SMS agents.

Operating System Installation

Install and configure the Windows NT Server operating system using the *Microsoft Windows NT Server Start Here (Basics and Installation)* book. Install Windows NT Service Pack 3 (SP3).

Management Station

The System Management Station manages the servers and workstations on your network using Systems Management Server (SMS). Using SMS, you can monitor network activity and distribute software packages and audit and inventory hardware and software.

To use SMS you must first install SQL Server on the machine that will become the SMS server. SMS stores all of its data in the SQL database.

SQL Server Installation

To install SQL Server Version 6.5, refer to the *Microsoft SQL Server Setup Guide* and the *Microsoft SQL Server Administrator's Companion* as you complete the following steps:

1. Make sure that you have 100 MB of space for the SQL Master Device.
2. Insert the SQL Server CD-ROM and run `setup.exe`.
3. When SQL Server installation prompts for the "sa" account password, leave it blank. Even if you enter a password at this point, it is not used by SQL Server after installation.
4. The SQL Server Service Pack 1 (SP1) installation launches automatically after the SQL Server installation is completed. When prompted for the "sa" password, again leave it blank.
5. After installing SQL Server and SP1, set the password "sa" by launching SQL Enterprise Manager and selecting Logins from the Manage menu.

SMS Server Installation

To install SMS Server Version 1.2, refer to the *Microsoft Systems Management Server for Windows NT Administrator's Guide* as you complete the following steps:

1. Make sure that all the servers and workstations you want to include in your SMS site are up and available on the network.
2. Insert the SMS Server CD-ROM and run `setup.exe`.
3. Complete the installation, taking the defaults.
4. When prompted, select "Install Primary Site."
5. When prompted, select "Detect logon servers during setup."

6. Include the software for Alpha as well as Intel clients.
7. When prompted for the SQL server name, take the defaults.
8. When prompted for the “sa” password, enter the password you set after the SQL Server installation.
9. The SMS Server Service Pack 1 (SP1) installation launches automatically after the SMS Server installation is completed.
10. Reapply Windows NT Service Pack 3 (SP3).

AlphaServer 800 System

Install the following software on the AlphaServer 800 system.

SMS Client

To install the SMS client, refer to the the *Microsoft Systems Management Server for Windows NT Administrator’s Guide* as you complete the following steps:

1. From the AlphaServer 800 system, launch Network Neighborhood and expand the SMS server.
2. Expand the SMS_SHR file share.
3. Double click `Runsms.bat` to install client utilities for Intel and Alpha based clients. The installation detects the platform and installs the appropriate software.
4. When prompted, provide the appropriate `.mif` file information, which includes user name, site name, and so forth.
5. Save the `.mif` information and exit.
6. Reapply Windows NT Server Service Pack 3 (SP3).
7. Reboot the AlphaServer 800.

5
Tests and Results

The DIGITAL HiTest program tests for several types of problems that affect the system. The HiTest program works together with other organizations to obtain and share test information for other categories.

This chapter describes the overview of test results, how the tests were set up, and where the data and programs were placed.

Also covered in this chapter is the test environment, tools used for testing, test configuration, test management, and the test process.

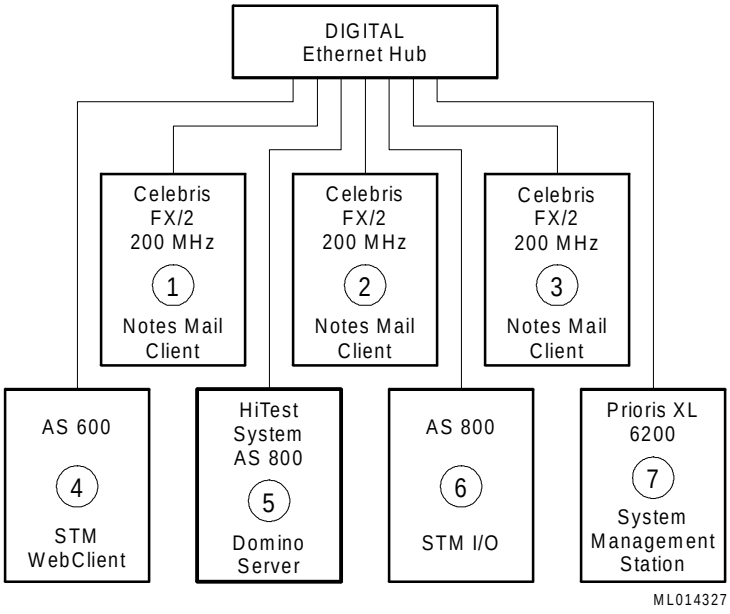
Overview of Results

Interoperability testing was performed successfully on the Lotus Domino Windows NT AlphaServer 800 HiTest Suite. System availability was tested using the correct operating features. Tests were performed to ensure the suite met installability criteria. Workload characterization was also performed.

Test Environment

Figure 5-1 shows the Lotus Domino Windows NT AlphaServer 800 test environment.

Figure 5-1: Test Environment



❶ Test driver machines: Notes Mail Client
❷ Test driver machines: Notes Mail Client
❸ Test driver machines: Notes Mail Client
❹ STM WebClient
❺ AlphaServer 800 HiTest Domino Server
❻ STM I/O File share testing
❼ System Management Station

Test Tools

The following tools were used for interoperability testing:

- **STE_NotesMail Version 1.0** (Internal Digital Equipment Corporation test tool)
  This tool generates mail messages and verifies their data integrity when they are sent by way of Notes.
- **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.
- **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 64 bytes to 64 KB. This tool reads and verifies these messages, randomly simulating a web client load. It performs data integrity checks on every page accessed.

Test Configuration

The test load was generated as follows:

- The average test duration was 40 hours.
- Windows NT workstations running STE_NotesMail generated Lotus Domino Mail client workload.
- STM I/O Tool ran continuously throughout the test.
- The system management station, running SMS, performed routine auditing on the server.

Minimum Configuration

The minimum configuration included two disks connected to one UltraSCSI controller as shown in Table 5-1.

Table 5-1: Disk Configuration for the Minimum Configuration

Disk Drive Group Name	Number of Disk Drives	Disk Drive Locations	Disk Drive Content and Data	Group Type	Usable Capacity
Disk 0	1	Drive 0	Windows NT Server system, boot partitions and paging file, Domino Server application, SMS application and share	JBOD	2.1 GB
Disk 1	1	Drive 1	Domino Server data (including web pages), log file, paging file (300-700 MB), fileshare	JBOD	2.1 GB
				Usable Total: **4.2 GB**	

Maximum Configuration

The maximum configuration included four disks connected to an UltraSCSI RAID controller as shown in Table 5-2.

Table 5-2: Disk Configuration for the Maximum Configuration

Disk Drive Group Name	Number of Disk Drives	Disk Drive Locations	Disk Drive Content and Data	Group Type	Usable Capacity
Disk 0	1	Drive 0	Windows NT Server system, boot partitions and paging file, SMS application, RAID Management Utility	JBOD	4.3 GB
RAIDset 1	3	Drive 1 Drive 2 Drive 3	Domino Server data and application, SMS share, file shares, and log files	RAID 5	8.6 GB
				Usable Total: **12.9 GB**	

Test Management

The HiTest configuration was managed using the Systems Management Server (SMS) Administrator, as described in the following procedure:

1. Launch the SMS Administrator and enter the “sa” password when prompted.
2. Select the Sites Window type (this is the default) and click OK.
3. To view domains, double click the site icon in the left pane.
4. To view the SMS clients in the domain, click the domain icon in the left pane. The SMS clients appear in the right pane.
5. To view information relevant to the client machine, double click the client in the right pane.
6. To view the various attributes and values for the client machine, click the property icons in the left pane.

Test Process and Results

The following information describes the test results:

- **Lotus Domino Mail** – The simulated Notes mail clients reported no errors.
- **File Shares** – STM I/O tool reported no errors. The WinBatch scripts reported no errors during file copy and comparison operations.
- **RAID** – When configuring the RAID disk sets using the RAID Array 200 RAID Configuration Utility (RA200RCU.EXE), initializing disks can take a long time. It took about one hour to initialize a 4.3 GB disk. For more information, see the section on RAID Array Configuration in Chapter 4.
- **Mail** – In the minimum configuration, 54.85 MB was transferred at an average rate of 17 KB per minute. In maximum configuration, the transfer rate was approximately twice that of the minimum rate. These figures apply to interoperability testing. For performance testing results, see the section Workload Capability in Chapter 2.
- **Network** – When operating a server that is expected to provide high-performance network services (such as Lotus Domino), 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.
- **System Management Station** – The Systems Management Server (SMS) Client performed as expected.

6
Problems and Solutions

This chapter describes problems encountered during the testing. Where appropriate, a solution for each problem is given which provides a fix or workaround. An impact statement is also provided.

Foundation Hardware

The following problem was identified:

Storage

Problem **Shelf failure (CH-O) error**

On first access of a disk after a reboot, the SWXCR Monitor reports a shelf failure error.

Impact **None**

This is a spurious error message.

Solution **Ignore**

HiTest testing established that the RAID configuration is correct and that this error message can be ignored.

Foundation Software

No problems were encountered.

AppSet Software

The following problem was identified:

Domino Server

Problem **Domino Server crash**

Domino Server crashed after backup and restore.

Impact **Low**

If this problem occurs, recovery is easy.

Solution **Restore local registry**

When performing a restore, use the option to restore the local registry.

System Management Station

No problems were encountered.

7
Detailed Hardware Configuration

This chapter describes the minimum and maximum hardware configuration for the Lotus Domino Windows NT AlphaServer 800 HiTest Suite by providing the following:

- System Diagram
- HiTest System Slot Configurations
- Input/Output Slot Usage
- Storage Architecture

System Diagram

Figure 7-1 shows a diagram of the maximum configuration of this HiTest Suite. Table 7-1 lists the major cables.

Figure 7-1: System Diagram

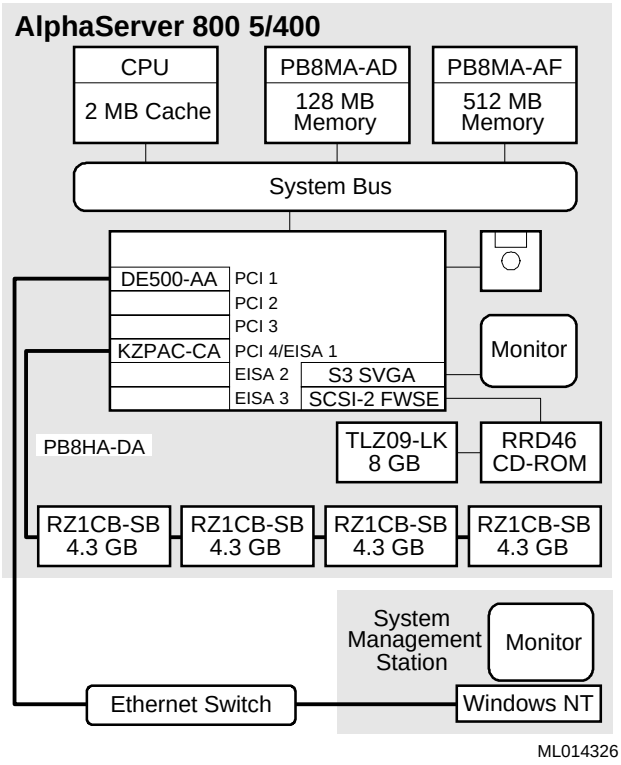


Table 7-1: Configuration Cabling

Part Number	Qty	Description	From	To
PB8HA-DA	1	SCSI-2 RAID Controller cable	KZPAC-CA	SCSI disk drives

HiTest System Slot Configuration

Figure 7-2 shows the HiTest System Slot Usage and Table 7-2 describes the minimum and maximum hardware configurations used in this HiTest Template.

Figure 7-2: HiTest System Slot Usage

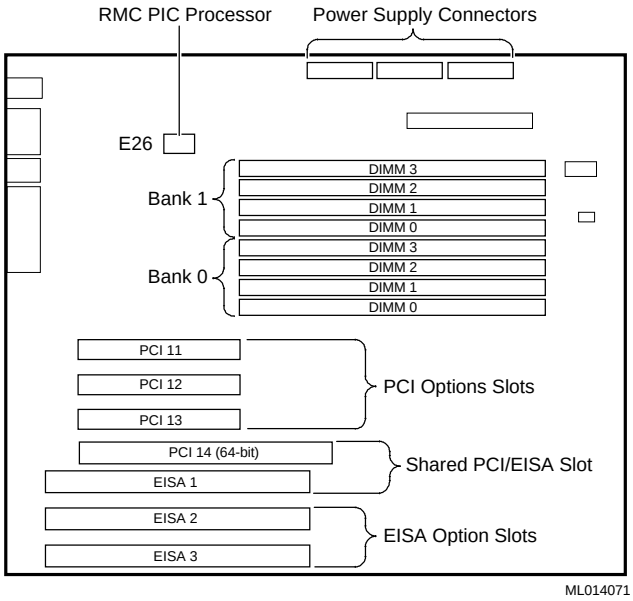


Table 7-2: System Slot Usage (Minimum and Maximum Configurations)

Slot	Minimum Configuration	Maximum Configuration	Description
DIMM3	open	PB8MA-AD (32 MB)	Memory Bank 1 (4 of 4)
DIMM2	open	PB8MA-AD (32 MB)	Memory Bank 1 (3 of 4)
DIMM1	open	PB8MA-AD (32 MB)	Memory Bank 1 (2 of 4)
DIMM0	open	PB8MA-AD (32 MB)	Memory Bank 1 (1 of 4)
DIMM3	PB8MA-AD (32 MB)	PB8MA-AF (128 MB)	Memory Bank 0 (4 of 4)
DIMM2	PB8MA-AD (32 MB)	PB8MA-AF (128 MB)	Memory Bank 0 (3 of 4)
DIMM1	PB8MA-AD (32 MB)	PB8MA-AF (128 MB)	Memory Bank 0 (2 of 4)
DIMM0	PB8MA-AD (32 MB)	PB8MA-AF (128 MB)	Memory Bank 0 (1 of 4)

Input/Output Slot Usage

Table 7-3 shows the input/output (I/O) slot usage for the minimum and maximum configurations of this HiTest Template.

Table 7-3: I/O Slot Usage (Minimum and Maximum Configurations)

Slot	Minimum Configuration	Maximum Configuration	Description
PCI-11	DE500-AA	DE500-AA	Fast Ethernet Adapter
PCI-12	open	open	–
PCI-13	open	open	–
PCI-14 / EISA-1	open	KZPAC-CA	PCI RAID Controller
EISA-2	open	open	–
EISA-3	open	open	–

Storage Architecture

Figure 7-3 shows the storage architecture used in this HiTest Template. Table 7-4 and Table 7-5 list the SCSI storage for the minimum and maximum configurations of this HiTest Template.

Figure 7-3: Storage Architecture

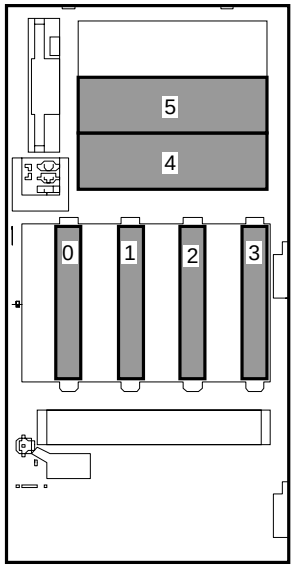


Table 7-4: SCSI Storage (Minimum Configuration)

Slot	Option/ Part Number	Description
0	RZ1BB-SB	Windows NT Server, paging, Domino Server application, SMS application and share
1	RZ1BB-SB	Domino Server data (including web pages), log file, paging file (300-700 MB) and file share
4	DS-RRD46-VA	600 MB 12X SCSI CD-ROM Drive
5	TLZ09-LK	8 GB DAT SCSI Tape Drive

Table 7-5: SCSI Storage (Maximum Configuration)

Slot	Option/ Part Number	Description
0	RZ1CB-SB	Windows NT Server, paging, and log files, SMS application, and RAID Management Utility
1	RZ1CB-SB	Domino Server and file shares, SMS share and log files (RAIDset member)
2	RZ1CB-SB	Domino Server and file shares, SMS share and log files (RAIDset member)
3	RZ1CB-SB	Domino Server and file shares, SMS share and log files (RAIDset member)
4	DS-RRD46-VA	600 MB 12X SCSI CD-ROM Drive
5	TLZ09-LK	8 GB DAT SCSI Tape Drive