



SAP Oracle  
DIGITAL UNIX AlphaServer 4100

---

DIGITAL HiTest Notes

Part Number: EK-HSPUA-HN. C01

**January 1998**

**Revision/Update Information:** This is a revised manual.

**Digital Equipment Corporation  
Maynard, Massachusetts**

---

**January 1998**

Digital Equipment Corporation makes no representations that the use of its products in the manner described in this publication will not infringe on existing or future patent rights, nor do the descriptions contained in this publication imply the granting of licenses to make, use, or sell equipment or software in accordance with the description.

Possession, use, or copying of the software described in this publication is authorized only pursuant to a valid written license from Digital or an authorized sublicensor.

© Digital Equipment Corporation 1998. All rights reserved.

The following are trademarks of Digital Equipment Corporation: AlphaServer, Celebris, DIGITAL, HSZ, TruCluster, ServerWORKS, StorageWorks and the DIGITAL logo.

The following are third-party trademarks:

ORACLE is a registered trademark and ORACLE7 is a trademark of Oracle Corporation.

SAP is a registered trademark of SAP Aktiengesellschaft

UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Ltd.

All other trademarks are the property of their respective owners.

---

# Table of Contents

## 1 Advantages of DIGITAL HiTest Suites

What Is a DIGITAL HiTest Suite? .....	1-1
DIGITAL HiTest Suite Components.....	1-1
Additional Hardware and Software.....	1-2

## 2 Configuration Data

Hardware and Software Components .....	2-1
Special Configuration Rules .....	2-6
Disk Configuration .....	2-6
Access and Accounts .....	2-6
R/3-Specific Configuration Rules .....	2-7
Security Rules .....	2-7
Performance Rules.....	2-7

## 3 System Installation and Setup

Hardware Installation .....	3-1
Operating System Installation.....	3-1
Disk Initialization.....	3-1
Operating System Custom Installation .....	3-3
Configure Network Interfaces.....	3-5
Fast Ethernet Controller (tu0) .....	3-5
Licenses.....	3-5
DIGITAL UNIX Patch Installation .....	3-6
Network Setup.....	3-7
hosts and rhosts.....	3-7
/etc/hosts.....	3-7
Post-Installation Procedures.....	3-8
Labeling the Local Disks .....	3-8
Adding Swap Space.....	3-9
Editing the crontab File.....	3-9
Logical Storage Manager (LSM) .....	3-9
Before LSM Installation.....	3-9
Installing LSM Option .....	3-10
volinstall.....	3-10
volsetup .....	3-11
Disk Setup for R/3 .....	3-11
SAP R/3 Installation .....	3-11
Specifics.....	3-11

## Contents

R/3 and Oracle Directory Structure .....	3-12
Starting the SAP R/3 Installation .....	3-13
Notes (Hinweise) .....	3-13
Check List .....	3-13
OS Dependencies.....	3-14
PCI Configuration.....	3-15
Mounting a CD-ROM .....	3-16
Checking and Modifying the DIGITAL UNIX Kernel.....	3-16
General Installation Preparations .....	3-16
Install a Dialog Instance.....	3-16
Take a Full Backup.....	3-16
<b>4 Tests and Results</b>	
Overview of Results .....	4-1
Test Environment .....	4-1
Test Tools.....	4-2
Test Configuration.....	4-2
System Limits and Characterization Data .....	4-3
Test Process and Results.....	4-3
<b>5 Problems and Solutions</b>	
Hardware Installation .....	5-1
Operating System Installation.....	5-1
lsm:v0liod: cannot open /dev/volioid .....	5-1
Directory /usr/users not found.....	5-1
Cannot Change /sapcd/DEC/INSTALL.....	5-2
1 end unsuccessfully .....	5-2
0 entries in TCPDB.....	5-2
APPL-SERVER not found .....	5-2
Oracle Installation .....	5-2
Failure during check of directories.....	5-2
orainst Compile Errors.....	5-2
local bin Directory .....	5-3
Testphase.....	5-3
No connect to the database .....	5-3
ORA-1631 .....	5-3
ORA-1632 .....	5-3
ORA-1653 .....	5-3
Unable to Obtain Requested SwapSpace.....	5-3
Benchinst fail.....	5-4
Perl is needed .....	5-4
Cleandb fail .....	5-4
Unable to extend table SAPR3.MDKP .....	5-4
Impsrc fail .....	5-4
Mmpv fail.....	5-5
Mess-tools not started .....	5-5
<b>6 Detailed Hardware Configuration</b>	
HiTest System Slot Configuration .....	6-3

**Figures**

Figure 3-1: Min/Max Performance Optimized PCI-Configuration..... 3-15  
 Figure 4-1: Test Environment.....4-1  
 Figure 6-1: System Diagram.....6-2  
 Figure 6-2: HiTest System Slot Usage .....6-3  
 Figure 6-3: I/O Slot Usage.....6-4

**Tables**

Table 2-1: SAP Oracle DIGITAL UNIX AlphaServer 4100 HiTest Template.....2-2  
 Table 2-2: System Management Console Template .....2-4  
 Table 2-3: Component Revision Levels .....2-5  
 Table 3-1: Directory Structure .....3-12  
 Table 6-1: Configuration Cabling .....6-2  
 Table 6-2: System Slot Usage (Minimum and Maximum Configurations) .....6-3  
 Table 6-3: I/O Slot Usage (Minimum and Maximum Configurations).....6-4



---

# Preface

This document provides an overview of DIGITAL HiTest Suites and detailed technical information about the SAP R/3 Oracle UNIX AlphaServer 4100 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 – 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 3 – System Installation and Setup	Provides information for installing and setting up this DIGITAL HiTest Suite.
Chapter 4 – 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 5 – Problems and Solutions	Discusses any problems and solutions that were discovered during testing.
Chapter 6 – 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](mailto:reader-comments@digital.com).

Please reference the complete document title and part number (EK-HSPUA-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.

All DIGITAL HiTest documents can also be downloaded over the Internet. Visit the Technical Support Center web page:

<http://cosmo.tay.dec.com> (Intranet)

<http://www.partner.digital.com:9003/cgi-bin/comet> (Internet)

## Related Documents

This document references the following manuals:

- *DIGITAL Unix Installation Guide (AA-QTLGB-TE)*
- *R/3 Installation on UNIX - ORACLE Database* guide
- *R/3 Installation on UNIX - OS Dependencies* manual

For a copy of *R/3 Installation on UNIX - ORACLE Database* and the *R/3 Installation on UNIX - OS Dependencies* manual contact SAP at <http://www.sap.com>.



---

## 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 or SAP Solution and Internet Servers.

In each HiTest Suite, the components are selected and the configurations designed to ensure high 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*.

### DIGITAL HiTest Suite Components

The SAP R/3 Oracle UNIX AlphaServer 4100 HiTest Suite contains three groups of components: the *DIGITAL HiTest Foundation*, the *DIGITAL HiTest AppSet* 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.

This Suite will meet the needs of medium to high-end SAP host-based configurations.

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.

---

## Configuration Data

This chapter describes the tested 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 2-1 identifies the range of hardware and software components that can be configured using the SAP Oracle DIGITAL UNIX AlphaServer 4100 HiTest Suite.

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

Table 2-3 lists the revision levels of the components.

The DIGITAL HiTest Template consists of three categories:

- **AppSet Software** – Includes software specific to one class of customer solutions, in this case SAP solutions and Internet Servers.
- **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 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 6.

Table 2-1: SAP Oracle DIGITAL UNIX AlphaServer 4100 HiTest Template

<b>SAP HiTest AppSet</b>				
<b>Oracle DIGITAL UNIX AlphaServer 4100 HiTest Foundation</b>				
For documentation and updates <a href="http://cosmo.tay.dec.com">http://cosmo.tay.dec.com</a> and <a href="http://www.partner.digital.com:9003/cgi-bin/comet">http://www.partner.digital.com:9003/cgi-bin/comet</a>				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
<b>AppSet Software</b>				
1	<b>SAP R/3 Version 3.1H</b> Contact SAP at <a href="http://www.sap.com">http://www.sap.com</a>		1	1
<b>Foundation Hardware</b>				
2	<p><i>Select one system:</i></p> <p><b>AlphaServer 4100 5/466, 1 GB DIGITAL UNIX License</b>  <b>AlphaServer 4100 5/466, 2 GB DIGITAL UNIX License</b>  <b>AlphaServer 4000 5/466, 1 GB DIGITAL UNIX License</b>  <b>AlphaServer 4000 5/466, 2 GB DIGITAL UNIX License</b></p> <p><i>Hardware includes:</i></p> <ul style="list-style-type: none"> <li>• 5/466 MHz CPU with 4 MB cache</li> <li>• Memory</li> <li>• PB2GA-JB TRIO64 1 MB Graphics</li> <li>• DE500-AA 10/100 Mbit Fast Ethernet</li> <li>• KZPDA-AA FW SCSI and cable</li> <li>• SCSI CD-ROM drive</li> <li>• RX23L-AB 1.44 MB Floppy drive</li> <li>• LK47W-A2 PS/2 style keyboard</li> <li>• Three-button PS/2 compatible mouse</li> </ul> <p><i>Software includes:</i></p> <ul style="list-style-type: none"> <li>• DIGITAL UNIX Operating System and base license</li> <li>• Unlimited User license</li> <li>• DIGITAL UNIX Server Extensions</li> <li>• ServerWORKS</li> <li>• Internet AlphaServer Administration software</li> <li>• DECEvent</li> </ul>	<b>DA-51JAB-FB</b> <b>DA-51JAB-GB</b> <b>DA-53JEB-FA</b> <b>DA-53JEB-GA</b>	1	1
3	<p><i>Select an enclosure:</i></p> <p><b>Pedestal with StorageWorks shelf</b>  <b>Cabinet with StorageWorks shelf</b></p> <p><i>Hardware includes:</i></p> <ul style="list-style-type: none"> <li>• 4.3 GB Wide Disk</li> <li>• Pedestal or cabinet with one StorageWorks shelf and mounting kit.</li> </ul> <p>The Pedestal supports up to two more shelves; cabinet up to seven more.</p>	<b>BA30P-AB/BB</b> ⓘ <b>H9A10-EL/EM</b> ⓘ	1	1
4	<p><i>For each system drawer installed in an H9A10-EL or H9A10-EM, order one:</i></p> <p><b>System Drawer Mounting Kit</b></p>	<b>CK-BA30A-BA /BB</b> ⓘ	1	1
5	<b>466 MHz CPU DIGITAL UNIX SMP UPG</b>	<b>KN304-DB</b>	0	3
6	<p><b>512 MB Memory Option</b>  <b>1 GB Memory Option</b>  <b>2 GB Memory Option</b></p> <p><b>Note:</b> This HiTest Template supports a memory range from 1 to 4 GB per system. When selecting memory options, stay within the Template's 4 GB maximum. The 4100 holds four memory options; the 4000, two.</p>	<b>MS330-EA</b> <b>MS330-FA</b> <b>MS330-GA</b>	0	See Note
7	<b>PCI one-port FWD SCSI controller</b>	<b>KZPSA-BB</b>	1	4
ⓘ Indicates that geography-specific part number variants are available. Check the appropriate price book for details.				



SAP HiTest AppSet				
Oracle DIGITAL UNIX AlphaServer 4100 HiTest Foundation				
For documentation and updates <a href="http://cosmo.tay.dec.com">http://cosmo.tay.dec.com</a> and <a href="http://www.partner.digital.com:9003/cgi-bin/comet">http://www.partner.digital.com:9003/cgi-bin/comet</a>				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
8	PCI fast SCSI-2 controller	KZPAA-AA	1	1
9	SCSI Bus Extender and Signal Converter	DWZZB-VW	2	4
10	StorageWorks Shelf, no personality module	BA356-JC	2	4
11	<i>Order one for each KZPSA-BB.</i> 5 meter 16-bit SCSI cable (internal)	BN21K-05	3	5
12	16 bit I/O module	BA35X-MH	2	4
13	<b>4.3 GB 7200 RPM UltraSCSI Disks</b> <b>Note:</b> This part number replaces RZ29B-VW, which was used for testing this HiTest Suite. 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	12	30
14	Basic StorageWorks Data Center Cabinet with shelves	SW800-FA/FB 	1	1
15	<i>Select one tape subsystem:</i> 140/280 GB SCSI DLT Tape Loader System, Rackmount 140/280 GB SCSI DLT Tape Loader System, Tabletop	TZ887-NE TZ887-NT	1	1
16	<i>Select one high-resolution color monitor:</i> 15-in Flat-square with 0.28mm dot pitch 17-in Trinitron with 0.28mm aperture grill pitch 21-in Diamondtron with 0.28mm aperture grille pitch	SN-VRCX5-WA SN-VRTX7-WA SN-VRCX1-WA	1	1
 Indicates that geography-specific part number variants are available. Check the appropriate price book for details.				
Foundation Software				
17	UNIX for AlphaServer V4.0B	Included with item 2		
18	DIGITAL UNIX V4.0B Alpha CD-ROM	QA-MT4AA-H8	1	1
19	Oracle7 for DIGITAL UNIX V7.3.3	Included with item 1	1	1
20	StorageWorks PLUS, which includes: • Networker Save and Restore for DIGITAL UNIX V4.3 • DIGITAL UNIX Logical Storage Manager (LSM) • AdvFS Utilities	QB-5RYAG-AA	1	1
21	Networker Save and Restore Application Interface for SAP /R3	QL-5JGAG-AA	1	1
22	NSR Jukebox Tier 1 License	QL-04UAL-3B	1	1
23	Performance Advisor for DIGITAL UNIX, 3.0C		1	1
24	Hard copy of this Suite's HiTest Notes	EK-HSPUA-HN	0	1
25	System Management Station	See Table 2-2	0	1

Table 2-2: System Management Console Template

SAP HiTest AppSet System Management Station				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
<b>Note:</b> This HiTest Suite is realized without a systems management station. When the system management 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.				
<b>Management Station Hardware</b>				
1	<b>DIGITAL PC 5100</b> <i>Hardware includes:</i> <ul style="list-style-type: none"> <li>• 200-MHz Pentium CPU with MMX</li> <li>• 512 KB secondary cache</li> <li>• 32 MB memory</li> <li>• Integrated Fast Ethernet (10/100)</li> <li>• 16X CD-ROM</li> <li>• PCI 64-bit S3 ViRGE/GX graphics controller (with 2 MB)</li> <li>• 3.2 GB disk drive</li> <li>• 1.44 MB floppy</li> </ul> <i>Software includes:</i> <ul style="list-style-type: none"> <li>• Windows NT Workstation 4.0 (factory installed)</li> </ul> <b>Note:</b> A functionally equivalent 80x86 system may be substituted without invalidating this HiTest Template.	FR-DAB04-AF	1	1
2	<b>Country Kit, North American</b>	FR-PC94K-AA	1	1
3	<b>32 MB SDRAM dual-bank DIMM Memory</b>	FR-PCCAM-EC	1	1
4	<b>Diamond 56.6 K Modem</b> <b>Note:</b> Used for page notification.	FR-PCXFA-AA	0	1
5	<i>Select one high resolution monitor:</i> <b>21" (19.6" view) 1600 x 1200 @75Hz</b> <b>19" (18" view) 1600 x 1200 @75Hz</b> <b>17" (16" view) 1280 x 1024 @75Hz</b>	FR-PCXAV-WZ FR-PCXAV-TZ FR-PCXAV-YZ	1	1
<b>Management Station Software</b>				
6	<b>Windows NT Workstation 4.0</b> <b>Note:</b> Install Windows NT Service Pack 3 (available from <a href="ftp://ftp.microsoft.com/bussys/winnt">ftp://ftp.microsoft.com/bussys/winnt</a> )	Included with item 1	1	1
7	<b>Hummingbird Exceed, Version 6.0</b> Contact <a href="http://www.hummingbird.com">http://www.hummingbird.com</a>	Hummingbird	1	1
8	<b>DIGITAL ServerWORKS Manager, Version 3.0</b>	Included with the base system	1	1
9	<b>StorageWorks Command Console, V1.1B</b>	Included with the Storage-Works kit	1	1
10	<i>Choose one BMC product:</i> <b>BMC PATROLWATCH for ServerWORKS, V3.2,</b>  <b>BMC PATROL Operator Console Windows NT</b> <b>BMC PATROL Developer Console Windows NT</b> <b>Note:</b> BMC products that are included with the AlphaServer are on the ServerWORKS Quick Launch CD. BMC PATROL Developer Console includes BMC PATROL Operator Console. Contact BMC at: <a href="http://www.bmc.com">http://www.bmc.com</a>	Included with base system  BMC BMC	0	1
11	<b>BMC PATROL Agent for Windows NT, lic. and media</b>	QB-5KKAB-WA	0	1

<b>SAP HiTest AppSet System Management Station</b>				
Line Item	Description	Part Number	HiTest Range	
			Min	Max
12	<b>BMC Operating System Knowledge Module for Windows NT, license and media</b>	<b>QB-5KLAB-WA</b>	0	1
<b>Software Installed and Licensed on Each UNIX Server</b>				
13	<b>Base UNIX systems management tools</b>	<b>Included with DIGITAL UNIX</b>	1	1
14	<b>DIGITAL UNIX Management Agent</b>	<b>Included with item 8</b>	1	1
15	<b>StorageWorks Command Console Agent</b>	<b>Included with item 9</b>	1	1
16	<b>BMC PATROL Agent for UNIX</b>	<b>Included with the AlphaServer</b>	0	1
17	<b>BMC Operating System Knowledge Module</b> <b>Note:</b> W* refers to the class: WA - Desktop; WB - Workgroup; WC - Departmental; WD - Enterprise Server	<b>QB-5KLAA-W*</b>	0	1

For more details on the hardware configuration, see Chapter 6.

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

Hardware Component	Hardware	Firmware	Software
SRM console	–	5.0-2	–
AlphaBIOS	–	5.63-0	
SCSI-2 controller (KZPAA-AA)	B01	–	
Converter (DWZZB-VW)	B01	–	
I/O module (BA35X-MH)	A04	–	
TZ887-NE	A03	–	
SCSI host adapter (KZPDA-AA)	B01		
FWD SCSI controller (KZPSA-BB)	P01	A11	
4.3 GB disks (RZ29B-VW)	–	DEC0016	
466 MHz CPU (KN304-DB)	A03		
Memory (MS330-FA)	B01		
StorageWorks shelf power supply (DS-BA35X-HH)	B01		
Software Component	Version/ Revision	Patch Level	
DIGITAL UNIX	4.0B	Rev564 40BAS00005 (all patches)	
SAP R/3	3.1H		
Networker Save & Restore (NSR) DIGITAL UNIX	4.3		
Networker Save & Restore Application Interface for SAP R/3	1.1		

### Special Configuration Rules

The special configuration rules for the SAP Oracle DIGITAL UNIX AlphaServer 4100 are as follows:

#### Disk Configuration

To guarantee that each disk keeps its OS-specific ID, ensure that `rz` numbers do not change. UNIX cannot handle a disk-specific identifier such as a label; instead, it uses the physical position within the hardware configuration to identify the disk. If the order of controllers changes, this could lead to database crashes and may make the system unbootable.

Each disk must have the same structure of partitions which does away with the DIGITAL UNIX standard partitioning where partitions overlap each other. The following partitions will be used on all RZ29s:

- c (whole disk)
- a (1st quarter)
- b (2nd quarter)
- d (3rd quarter)
- e (4th quarter)
- f (whole disk without blocks 0-15)
- g (like partition a without blocks 0-15)

Partitions f and g are only used as workarounds to help LSM and the UNIX raw devices handle the first few blocks of a disk.

The partitions should be equally sized and should not overlap, with the exception of partition c which describes the whole disk. For the label descriptor see the section Labeling the Local Disks, in Chapter 3.

For the application-specific data structures, striped LSM volumes shall be used wherever possible. Multi-partition LSM volumes shall be built from partitions of the same letter (g, c, d, e, or f, depending on the amount of data needed), taken from disks on different controllers and shelves.

#### Access and Accounts

All logins for accounts root, db-administrator (for instance orasdr) and SAP R/3 administrator (for instance sdradm) start with the c shell, have the display properly set, and line editing mode via cursor keys enabled.

The path is setup so work-related tasks could be performed without switching from directory to directory.



## R/3-Specific Configuration Rules

This section describes security and performance rules to follow for R/3-specific disk configuration.

The following two categories of rules must be followed:

### Security Rules

These security rules are the most important ones and *must* be respected. Failure to do so could lead to loss of data.

The following directories must be on (at least) three different disks:

- /oracle/<SID>/origlogA and B
- /oracle/<SID>/mirrlogA and B
- /oracle/<SID>/saparch

The following directory may not be on the same disk as the /oracle/<SID>/sapdata<n> directories:

- /oracle/<SID>/saparch

The following directories must be on (at least) two different disks to keep (at least) two copies of the Oracle control file on separate disks:

- /oracle/<SID>
- /oracle/<SID>/sapdata1
- /oracle/<SID>/sapdata2

### Performance Rules

The following directories should be located on different disks:

- /oracle/<SID>/origlogA
- /oracle/<SID>/origlogB

The redo logs should be on different disks than the /oracle/<SID>/sapdata<n> directories.

Use the file systems /oracle/<SID>/sapdata<n> exclusively for the data files of the database.

Use a separate disk for /oracle/<SID>/saparch.

Redo logs contain hot files (/usr/sap/<SID> contains the SAP page and roll files). For this reason, they are best located on different disks.

Keep the following hot tablespaces on different disks, if possible:

- PSAPSTABD
- PSAPCLUD
- PSAPBTABD

Try to distribute the load evenly amongst the disks, the disk controllers, and the I/O buses.



---

## System Installation and Setup

This chapter provides useful information when preparing to install and set up a DIGITAL HiTest System configured from this DIGITAL HiTest Suite. System preparation includes installing hardware, operating system, and applications.

### Hardware Installation

Install and interconnect the hardware as shown in Chapter 6.

### Operating System Installation

Install the DIGITAL UNIX 4.0B operating system with all kernel options.

1. Boot the CD containing the DIGITAL UNIX 4.0B distribution:  
P00>>>**boot dka500**
2. Follow the steps in the *DIGITAL UNIX Installation Guide Version 4.0B* (or higher) (Part Number: AA-QTLGB-TE).
3. When prompted to select the type of installation, select 3 ) UNIX Shell and proceed to the Disk Maintenance section to create disk device special files and check partitioning.

### Disk Initialization

This section describes the steps required to create disk device special files, label the disks, and check the partitions.

1. Change to the /dev directory, as follows:  
# **cd /dev**
2. Use the MAKEDEV command to create disk device special files for rz8:  
# **./MAKEDEV rz8**  
MAKEDEV: special file(s) for rz8:  
rz8a rz8b rrz8b rz8c rrz8c rz8d rrz8d rz8e rrz8e rz8f rrz8f  
rz8g rrz8g rz8h rrz8h
3. Check the disk label information on rz8:  
# **disklabel -r rz8**  
/dev/rrz8a:  
type: SCSI  
disk: RZ29B  
label:  
flags:  
bytes/sector: 512  
sectors/track: 113  
tracks/cylinder: 20

## System Installation and Setup

```
sectors/cylinder: 2260
cylinders: 3708
sectors/unit: 8380080
rpm: 7200
interleave: 1
trackskew: 9
cylinderskew: 16
headswitch: 0          # milliseconds
track-to-track seek: 0 # milliseconds
drivedata: 0
8 partitions:
#   size      offset  fstype  [fsize bsize cpg]
a: 131072      0      unused   0     0     # (Cyl.0 - 57*)
b: 401408    131072  unused   0     0     # (Cyl.57*- 235*)
c: 8380080      0      unused   0     0     # (Cyl.0 - 3707)
d: 2623488    532480  unused   0     0     # (Cyl.235*- 1396*)
e: 2623488    315596  unused   0     0     # (Cyl.1396*- 2557*)
f: 2600624    5779456  unused   0     0     # (Cyl.2557*- 3707)
g: 3936256    532480  unused   0     0     # (Cyl.235*- 1977*)
h: 3911344    4468736  unused   0     0     # (Cyl.1977*- 3707)
#
```

#### 4. Start the disk label editor:

```
# disklabel -e rz8
/dev/rrz8a:
type: SCSI
disk: RZ29B
label:
flags:
bytes/sector: 512
sectors/track: 113
tracks/cylinder: 20
sectors/cylinder: 2260
cylinders: 3708
sectors/unit: 8380080
rpm: 7200
interleave: 1
trackskew: 9
cylinderskew: 16
headswitch: 0          # milliseconds
track-to-track seek: 0 # milliseconds
drivedata: 0
8 partitions:

#   size      offset  fstype  [fsize bsize cpg]
a: 2000000      0      unused   0     0     # (Cyl.  0 - 57*)
b: 2000000  2000000  unused   0     0     # (Cyl.  57*- 235*)
c: 8380080      0      unused   0     0     # (Cyl.  0 - 3707)
d: 2000000  4000000  unused   0     0     # (Cyl.  235*- 1396*)
e: 2000000  6000000  unused   0     0     # (Cyl. 1396*- 2557*)
f:  0          0      unused   0     0     # (Cyl. 2557*- 3707)
g:  0          0      unused   0     0     # (Cyl.  235*- 1977*)
h:  380080    8000000  unused   0     0     # (Cyl. 1977*- 3707)
```

5. Save your edits and exit the editor:

```

:wq
write new label? [y]: y
#
# exit
INIT: SINGLE-USER MODE
Initializing system for DIGITAL UNIX installation. Please
wait...
*** Performing CD-ROM Installation
Loading installation process and scanning system hardware.

```

Go to the section, Operating System Custom Installation.

## Operating System Custom Installation

This section describes the custom installation phase of the operating system installation.

1. Select 2) Custom Installation.
2. Follow the display and enter data when prompted. The hostname for the HiTest system was ALF5.
3. The following message is displayed when the disk scan occurs:

```

** Scanning system for disk devices. Please wait ...
Only one disk detected in this system (/dev/rz8, SCSI RZ29B
type). All file systems will be on that disk.
The rz8 disk has a non-default partition table.
Partition Start      Size      End      Overlaps
Default
  a          0      131072    131071    c
  b      131072    401408    532479    c
  c          0      8380080   8380079   a b d e f g h
  d      532480    2623488   3155967   c g
  e      3155968    2623488   5779455   c g h
  f      5779456    2600624   8380079   c h
  g      532480    3936256   4468735   c d e
  h      4468736    3911344   8380079   c e f
Existing
  a          0      2000000   1999999   c
  b      2000000    2000000   3999999   c
  c          0      8380080   8380079   a b d e h
  d      4000000    2000000   5999999   c
  e      6000000    2000000   7999999   c
  f          0          0          -1
  g          0          0          -1
  h      8000000     380080    8380079   c

```

4. Select the existing table and do not use the default disk layout, as follows:  
Choose which partition table to use.  
1) Default table  
2) Existing table  
Enter your choice: **2**  
The default disk layout is:  
\* root file system on the "a" partition, type UFS  
\* /usr file system on the "g" partition, type UFS  
\* /var as part of /usr

## System Installation and Setup

```
* first swapping area (swap1) on the "b" partition
* no second swapping area (swap2)
Use this default disk layout (y/n) ? n
```

5. Select the AdvFS file system for the root file system, as follows:

```
1) UFS -- UNIX file system
2) AdvFS -- advanced file system
```

Enter your choice: **2**

6. Select the rz8 partition where the /usr file system will reside, as follows:

	Partition	Start	Size	End	Overlaps
1)	b	2000000	2000000	3999999	c
2)	d	4000000	2000000	5999999	c
3)	e	6000000	2000000	7999999	c
4)	h	8000000	380080	8380079	c

Enter your choice: **2**

7. Select the rz8 partition where the first swapping area (swap1) will reside, as follows:

	Partition	Start	Size	End	Overlaps
1)	b	2000000	2000000	3999999	c
2)	e	6000000	2000000	7999999	c
3)	h	8000000	380080	8380079	c

Enter your choice: **1**

8. You may choose to have a second swapping area (swap2).

Do you want a second swapping area (y/n)? **n**

9. You can make /var a separate file system, or you can have it share space on the /usr file system.

Should /var be a separate file system (y/n)? **y**

10. Select the rz8 partition where the /var file system will reside.

	Partition	Start	Size	End	Overlaps
1)	e	6000000	2000000	7999999	c
2)	h	8000000	380080	8380079	c

Enter your choice: **1**

11. Select the file system type for the /var file system.

```
1) UFS -- UNIX file system
2) AdvFS -- advanced file system
```

Enter your choice: **2**

12. Check the file system:

You have requested this file system layout:

```
* root file system on rz8a, type AdvFS
* /usr file system on rz8d, type AdvFS
* /var file system on rz8e, type AdvFS
* first swapping area (swap1) will be on rz8b
* no second swapping area (swap2)
```

Is this the correct file system layout (y/n)? **y**

13. Install all mandatory and optional subsets.

14. Set the console boot variables, as follows, then boot:

```
>>> set boot_osflags A
>>> set bootdef_dev dkb100
>>> boot
```

15. When prompted, select all kernel options. At this point the kernel is built and the system is rebooted. Proceed to the section Configure Network Interfaces.

## Configure Network Interfaces

After the kernel build and system reboot, login as root and start setup as follows:

1. `# setup`
2. From the setup menu, select:
  - 1) Network Configuration Application.
3. From the Network Configuration Application menu, select:
  - 1 Configure Network Interfaces

---

### Note

---

Refer to the System Administration and Network Administration guides for configuring information.

---

The environment in which a system is installed determines many of the network configuration settings. The following section list the settings used for this HiTest System as installed in the test laboratory. After the interface is configured, exit the menu and enter yes when prompted to have netsetup automatically restart the network services. Exit from the Setup menu and reboot the system. The DIGITAL UNIX installation is complete.

### Fast Ethernet Controller (tu0)

Hostname for interface tu0 is alf5.  
 The IP address for interface tu0 is 111.111.111.15.  
 The subnet mask for tu0 is 255.255.255.0.  
 No additional ifconfig flags for this interface was set.

## Licenses

Licenses, also known as PAKs (Product Authorization Keys) are delivered with the system. The PAKs that come with this system include:

- OSF-BASE – Required for any system running the DIGITAL UNIX Operating System.
- NET-APP-SUP-200 – Required to use the AdvFS Utility product.

Register using the following steps:

1. `#lmf register` (or `#lmfsetup`)  
 A template is displayed. At this moment, you are using the vi editor.
2. Add the information contained in the PAKs that came with the software.

The NAS-APP-SUP-200 is one license for multiple products. Generate multiple product licenses using the following procedure:

1. Place the CD, "DIGITAL NAS V7.1 for DIGITAL UNIX" (April 96 - AG-QVDTA-BE) in the CD drive.
2. Mount it as follows:  
`# mount -dr /dev/rz5c /mnt`

---

### Note

---

If desired, you can create a softlink between `/dev/cd` and `/dev/rz5c` by issuing the following command: `# ln -s /dev/rz5c /dev/cd`

---

## System Installation and Setup

3. Install the NAS product, as follows:  
# **setld -l /mnt/n30710/kit NASBASE710**
4. Generate the license with the following command:  
# **/bin/nasinstall**
5. Display the licenses with the command:  
# **lmf list**

### DIGITAL UNIX Patch Installation

This section describes how the DIGITAL UNIX patches were installed. Patches are dependent on the DIGITAL UNIX version (4.0b for this HiTest system). The patches are located at [ftp://ftp.service.digital.com/public/Digital\\_UNIX/v4.0b](ftp://ftp.service.digital.com/public/Digital_UNIX/v4.0b).

1. Using a browser or ftp, copy the following files:  
Patch: duv40bas00005-19971009.tar  
Readme: duv40bas00005-19971009.README  
Checksum: duv40bas00005-19971009.CHKSUM  
Rel.Notes: duv40bas00005-19971009.ps

---

#### Note

---

The contents of the patch directory are frequently updated. The patch file names may change as these updates occur.

---

2. Move duv40bas00005-19971009.\* to /, as follows:  
# **mv duv40bas00005-19971009.\* /**
3. Read duv40bas00005-19971009.README:  
# **more duv40bas00005-19971009.README**
4. Read, the release notes, duv40bas00005-19971009.ps:  
# **dxvdoc duv40bas00005-19971009.ps**
5. Unpack the tar file, as follows:  
# **tar xvf duv40bas00005-19971009.tar**
6. Bring system to single user mode:  
# **shutdown now**  
or  
# **shutdown -h now**  
>>> **boot -fl "s"**
7. Mount /usr and /var and / writeable:  
# **mount /usr**  
# **mount /var**  
# **mount -u /**
8. Call the Patch Utility:  
# **cd /patch\_kit**  
# **./dupatch**
9. From the DIGITAL UNIX Patch Utility, select 31) ALL of the above.



10. After the patches are installed and you have exited from the patch utility, exit from superuser into run level 3, as follows:

```
#
# exit
Enter run level (0-9, s or S): 3
will change to state 3
INIT: New run level: 3
starting LSM
system is starting up to multi user level ...
```

Rebuild the kernel to incorporate the modifications:

logon as user root

```
# doconfig -c ALF5
```

The new kernel is /sys/alf5vmunix

```
# mv /sys/alf5/vmunix /vmunix
```

```
# reboot
```

## Network Setup

Please do the NFS setup for your personal purposes.

## hosts and rhosts

Create the file .rhosts in the directory /. The HiTest system rhosts files contained the following lines:

```
alf5 root
<any other host> root
```

### **/etc/hosts**

Edit the file `hosts` in `/etc` to include the names of the hosts on the network. The lines added for the HiTest System environment are:

```
#
127.0.0.1      localhost
111.111.111.15  alf5          ← Ethernet name hostbased System
111.111.111.15  du1001.fra.dec.com  du1001
```

### Post-Installation Procedures

Post-installation tasks include disk labeling, setting up additional swap space, and installing LSM.

#### Labeling the Local Disks

The local disks must get a disklabel. They cannot be mounted until this has been done. According to the rules specified, all disks will get 4 non-overlapping 1-GB partitions, with some add-ons to help LSMs deal with blocks 1–16 (the same is true for raw devices).

The following labeling procedure was executed on all disks from rz9 to rz46:

```
#!/bin/csh
#
# EDIT HISTORY
#     20.06.96 rhs adapted to new STC standards, improved comments
#
# ABSTRACT
#     Labels a disk. label to be written is taken from file
#     label_rz29
#
#
# init variables
#
set programm=`basename $0`      # Programmname für Fehlermeldungen
set host=`hostname`            # Hostname, beschleunigter Zugriff
set rdisk=/dev/r${1}c
disklabel -r $rdisk
echo "Labeling disk $1 "
echo -n "Is This ok (y,n)? "
if ($< != "y" ) exit 0
#
disklabel -z ${rdisk}
disklabel -wr ${rdisk} RZ29
disklabel -R ${rdisk} label_rz29
disklabel -r ${rdisk}
exit 0
```

The label structure is taken from the following file:

```
# cat label_rz29
type: SCSI
disk: RZ29
label: SDR
flags:
bytes/sector: 512
sectors/track: 113
tracks/cylinder: 20
sectors/cylinder: 2260
cylinders: 3708
sectors/unit: 8380080
rpm: 3600
interleave: 1
trackskew: 0
cylinderskew: 0
```

```

headswitch: 0          # milliseconds
track-to-track seek: 0 # milliseconds
drivedata: 0
8 partitions:
#          size  offset  fstype  [fsize bsize  cpg]
a:  2095032      0  unused    1024  8192  # (Cyl.  0*- 926*)
b:  2095016 2095032  unused    1024  8192  # (Cyl. 926*- 1853*)
c:  8380080      0  unused    1024  8192  # (Cyl.  0 - 3707)
d:  2095016 4190048  unused    1024  8192  # (Cyl. 1853*- 2780*)
e:  2095016 6285064  unused    1024  8192  # (Cyl. 2780*- 3707*)
f:  8380064      16  unused    1024  8192  # (Cyl.  0 - 3707)
g:  2095016      16  unused    1024  8192  # (Cyl.  0 - 926*)
h:           0      0  unused         0    0  # (Cyl.  0 - -1)

```

## Adding Swap Space

A separate disk should be used for swapping (this is an R/3 requirement for normal OLTP applications; the HiTest interoperability testing will not do any swapping). Add the following line to `/etc/fstab`:

```
/dev/rz14c  swap2 ufs sw 0 2
```

If the system can be tuned so swapping is not heavily used (for example, when using 2-GB or more of main memory), switch to deferred swapping by issuing:

```
rm /sbin/swapdefault
```

Therefore, some disks can be used for the distribution of the database load instead of for swapping.

## Editing the crontab File

Edit the `crontab` file for the user `root` because files in the `/tmp` directory are automatically deleted after 2 days. Note that the `/tmp` directory is used during the SAP installation. If an installation is started on Friday and continued on Monday, there could be problems.

Type the following to edit the file:

```
# crontab -e
```

## Logical Storage Manager (LSM)

The standard R/3 database is on a 4-way striped LSM volume (made up of 4 complete `rz29s` in 2 controllers). Also, the archive files were written to a 2-way striped LSM volume, made up of 2 1-GB partitions on different controllers. This is enough disk tuning to run the DIGITAL HiTest stress test without disk contention.

Some basic knowledge about LSM is needed to understand the topics discussed in this section.

## Before LSM Installation

Check the following:

- Ensure that the DIGITAL UNIX operating system is installed as previously described.
- All the disks have a disklabel, as previously described.
- License LSM-OA is installed and loaded.

## System Installation and Setup

### Installing LSM Option

LSM is part of the kernel options that you can select when installing DIGITAL UNIX.

If the LSM option was not selected during the DIGITAL UNIX installation, you should install it now, as follows:

1. Mount the DEC OSF/1 Operating System CD as follows:  

```
# mount -dr /dev/cd /mnt
# cd /mnt/ALPHA/BASE
# setld -l
```
2. Select the options:  
Logical Storage Manager  
Logical Storage Manager GUI  
Logical Storage Manager Kernel Header and Common Files  
Logical Storage Manager Kernel Objects
3. Save a copy of the `/usr/sys/conf/alf5` configuration file.
4. Build a new kernel by using `doconfig` without any option:  

```
# doconfig
```

Do you want to replace the existing configuration file ?
5. Select all the kernel options. (Logical Storage Manager is included in the “All of the above.”)

---

#### Note

---

Step 5 must be done to get LSM in the kernel. Do not just add the following two lines in to the configuration files.

---

6. Compare the old and new configuration file, there are now two new lines near the end of the file:

```
pseudo-device    lsm_ted        0
pseudo-device    lsm            1
```
7. Rebuild the kernel:

```
# cp /vmunix /vmunix.save
# doconfig -c ALF5
```

```
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***
Saving /sys/conf/ALF5 as /sys/conf/ALF5.bck
```
8. Do you want to edit the configuration file? (y/n) [n]: **n**  

```
*** PERFORMING KERNEL BUILD ***
Working....Fri Feb 7 11:02:11 MET DST 1997
```
9. Move the new kernel to `/vmunix`:

```
# mv /sys/ALF5/vmunix /vmunix
```
10. Stop and start the system to activate the new kernel:

```
# init 0    (or shutdown -r now)
>>> boot
```

### volinstall

Create the LSM special files with the following command:

```
# volinstall
```

The command also sets up the system for automatic LSM start at boot time (see `/etc/inittab`).

### volsetup

Run `volsetup` to create the `rootdg`. Partition `h` of the system disk will be used.

With this command:

- `vold` is initialized
- root disk group ( `rootdg` ) is initialized
- `rz22` will be an LSM simple disk

### Disk Setup for R/3

For the SAP R/3 database, the following partitions will be used:

- `rz9f`, `rz10f`, `rz17f` and `rz18f` as a striped volume for all tablespaces
- `rz11b` and `rz19b` as a striped volume for the archived log files

To build the big volume, we must add 4 disks to the `rootdg` diskgroup using the following commands:

```
# voldiskadd rz9f
# voldiskadd rz10f
# voldiskadd rz17f
# voldiskadd rz18f
.
.
.
```

Using `dxlsm`, build a striped volume from these disks by computing the total number of bytes as a multiple of 128K — available on these 4 disks — and manually typing it into the size field of the volume popup mask.

The same procedure is to be applied for the second (smaller) volume.

## SAP R/3 Installation

At this point, the system is ready for the installation of SAP R/3. The current release at installation time was 3.1H.

### Specifics

The following are the specifics for the SAP R/3 installation:

- `SID =SDR`  
SDR will have the instance number 00 for the DIGITAL HiTest environment.

The name of the SAP System is abbreviated to `SID` (SAP System ID).

Since an R/3 System consists of exactly one database, the DB name and the SAP System ID can be identified. Contrary to that, one database consist of different DB Instances which are abbreviated to `SID`.

- Available RAM: 2 – 4 GB
- Modify `SAPFS.TPL` No: ORACLE mirroring
- `/usr/sap/trans`: local File System
- Installation directory: `/sapmnt/SDR/install`

## R/3 and Oracle Directory Structure

SAP enforces a rigid naming scheme concerning the entry points for the R/3 structures. The following entries must be present:

**Table 3-1: Directory Structure**

Entries	Description
/usr/sap/trans	Global directory for all SAP systems
/sapmnt/SDR	Systemwide data for one SAP system
/usr/sap/SDR	Instance-specific data
/oracle/stage	Installation and upgrade directory for the database software
/oracle/SDR	Directory for the SDR ORACLE instance
/oracle/SDR/sapdata1	SAP data
/oracle/SDR/sapdata2	SAP data
/oracle/SDR/sapdata3	SAP data
/oracle/SDR/sapdata4	SAP data
/oracle/SDR/sapdata5	SAP data
/oracle/SDR/sapdata6	SAP data
/oracle/SDR/sapdata7	SAP data
/oracle/SDR/origlogA	ORACLE redo logs 1 and 3
/oracle/SDR/origlogB	ORACLE redo logs 2 and 4
/oracle/SDR/saparch	ORACLE archives of redologs
/oracle/SDR/sapreorg	Work directory for database administration
/oracle/SDR/sapbackup	Backup information

With the UNIX File System (UFS) it is impossible to have these directories and still adhere to the security rules given in the Special Configuration Rules section of Chapter 2. The entries in /etc/fstab and the subsequent procedure are used to set up the directory structure for the HiTest System.

```

/dev/rz8a      /           ufs    rw 1 1
/proc         /proc      procfs rw 0 0
/dev/rz8d     /usr       ufs    rw 1 2
/dev/rz8e     /var       ufs    rw 1 2
/dev/rz8b     swap1      ufs    sw 0 2
/dev/rz14c    swap2      ufs    sw 0 2
/dev/rz20a    /SDR/admin ufs    rw 0
/dev/vol1/DB_vol /SDR/data  ufs    rw 0 2
/dev/vol1/arch_vol /SDR/arch  ufs    rw 0 2
/dev/rz11a    /SDR/log1  ufs    rw 0 2
/dev/rz19a    /SDR/log2  ufs    rw 0 2
/dev/rz12a    /oracle/stage ufs    rw 0 2

```

Map the SAP structures onto the available physical structure using the following commands:

```

mkdir /usr/sap
mkdir /usr/sap/SDR
mkdir /usr/sap/trans
#      Administration directories are accessed via mount point

```

```

# /SDR/admin:
mkdir /SDR/admin/sapmn
# mkdir /SDR/admin/oracle
ln -s /SDR/admin/sapmnt /sapmnt/SDR
ln -s /SDR/admin/oracle /oracle/SDR
# Datafiles are on a big LSM stripeset:
# /dev/vol/DB_vol mounted on /SDR/data
mkdir /SDR/data/sapdata1
mkdir /SDR/data/sapdata2
mkdir /SDR/data/sapdata3
mkdir /SDR/data/sapdata4
mkdir /SDR/data/sapdata5
mkdir /SDR/data/sapdata6
ln -s /SDR/data/sapdata1 /oracle/SDR/sapdata1
ln -s /SDR/data/sapdata2 /oracle/SDR/sapdata2
ln -s /SDR/data/sapdata3 /oracle/SDR/sapdata3
ln -s /SDR/data/sapdata4 /oracle/SDR/sapdata4
ln -s /SDR/data/sapdata5 /oracle/SDR/sapdata5
ln -s /SDR/data/sapdata6 /oracle/SDR/sapdata6
# Redo logfiles and their mirrors are put on 2 partitions:
# rz11b mounted on /SDR/log1
# rz19b mounted on /SDR/log2
mkdir /SDR/log1/origlogA
mkdir /SDR/log1/mirrlogB
mkdir /SDR/log2/origlogB
mkdir /SDR/log2/mirrlogA
ln -s /SDR/log1/origlogA /oracle/SDR/origlogA
ln -s /SDR/log1/mirrlogB /oracle/SDR/mirrlogB
ln -s /SDR/log2/origlogB /oracle/SDR/origlogB
ln -s /SDR/log2/mirrlogA /oracle/SDR/mirrlogA
# Redo logfiles are archived on a small stripeset
# which also contains the SAP maintenance directories:
# /dev/vol/arch_vol mounted on /SDR/arch
mkdir /SDR/arch/saparch
ln -s /SDR/arch/saparch /oracle/SDR/saparch
ln -s /SDR/arch/sapbackup /oracle/SDR/sapbackup
ln -s /SDR/arch/sapreorg /oracle/SDR/sapreorg

```

## Starting the SAP R/3 Installation

SAP provides documentation to install their R/3 software. This section highlights the main SAP R/3 installation steps, and is intended to make the reader aware of the choices, and reasons for those choices, made during the SAP R/3 installation on this HiTest System.

## Notes (Hinweise)

Every time a SAP installation or upgrade is performed, read the latest notes for information concerning your plans. To ensure that the notes are read, a password (included in the notes) is prompted by the SAP installation or upgrade procedure. Following is the list of notes for the installation of SAP R/3 3.1H with Oracle which are relevant to this HiTest Suite:

- 74278 R/3 Installation on UNIX
- 74279 R/3 Installation on UNIX - OS Dependencies
- 74275 R/3 Installation on UNIX - ORACLE Database

## Check List

The document, *Check list - Installation Requirements: ORACLE*, is used to make sure that the system meets SAP requirements. This document is provided by SAP as part of the installation kit.

### OS Dependencies

Complete the check list, then continue by using the *R/3 Installation on UNIX - OS Dependencies* manual. The manual covers the following topics:

1. General Notes on NIS
2. Users and Groups
3. Services
4. Mounting a CD-ROM
5. Checking and Modifying the DIGITAL UNIX Kernel
6. File Systems/Raw Devices/Swap Space
7. Mounting Directories via NFS
8. Creating Groups and Users
9. SAP Tool Kinst
10. Troubleshooting

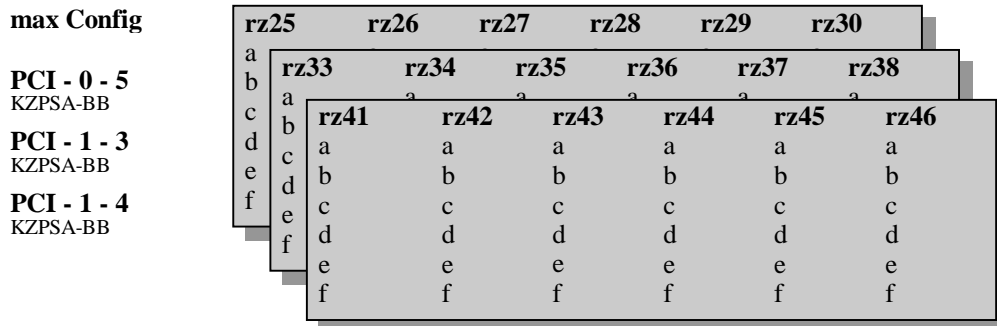
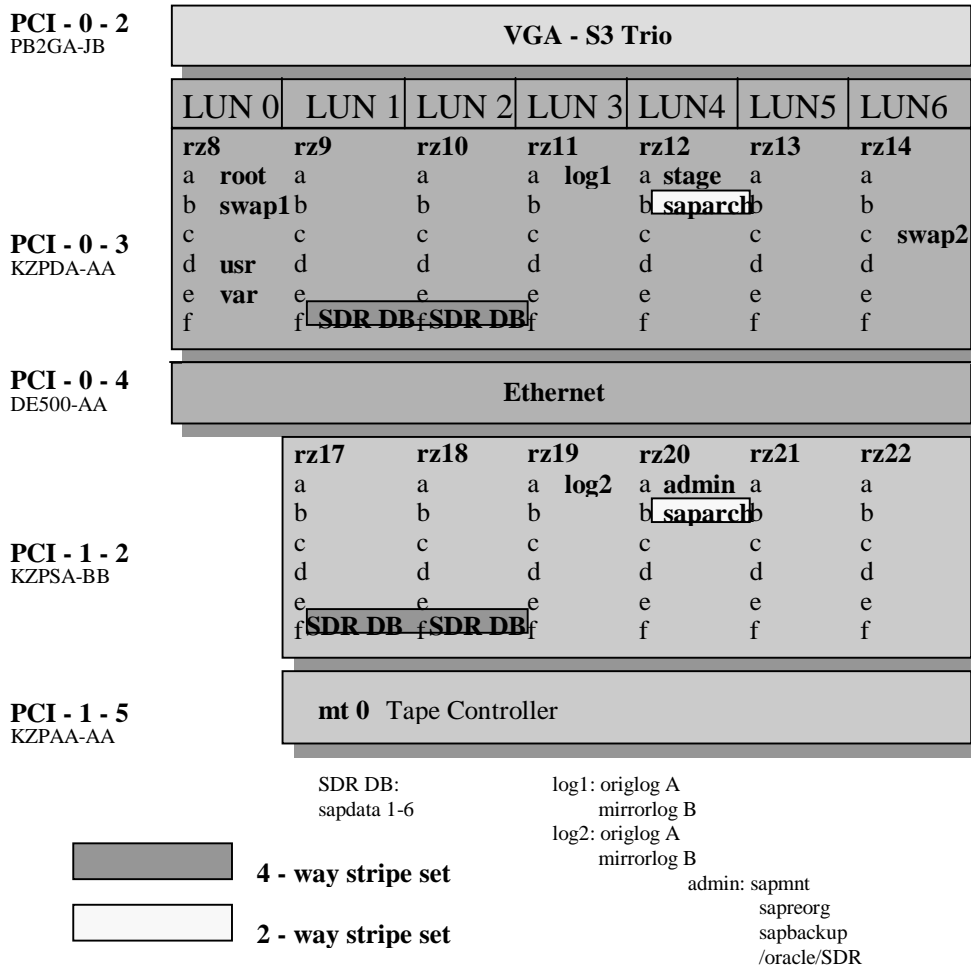
The following sections cover steps 4 and 5.



## PCI Configuration

Figure 3-1 shows the stripesets and the PCI Configuration.

**Figure 3-1: Min/Max Performance Optimized PCI-Configuration**



---

### Note

---

The oracle staging area `/oracle/stage` is needed only during installation.

---

### Mounting a CD-ROM

1. Create a mount point directory if it does not already exist:  
`# mkdir /sapcd`
2. Mount your CDs with the command:  
`# mount -t cdfs -dr /dev/cd /sapcd`

### Checking and Modifying the DIGITAL UNIX Kernel

Since DIGITAL UNIX Version 3.0, a dynamic approach exists to change kernel parameters. Most of the system parameters can be specified in a file called `/etc/sysconfigtab`. Any modification in this file will be taken into consideration at the next system boot. A new kernel generation is not required.

The values for the system configuration file `/etc/sysconfigtab` are listed in *R/3 Installation on UNIX – OS Dependencies* in the particular DIGITAL Unix Chapter. Please apply these values as demanded.

1. Build a new kernel:  
`# doconfig -c ALF5`  
Edit configuration file ? `no`  
The system proceeds to build the kernel.
2. Once complete, copy it to the root directory:  
`# cp /sys/ALF5/vmunix /vmunix`  
Reboot the system:  
`# init 0`  
`>>> boot`

### General Installation Preparations

Refer to the *R/3 Installation on UNIX - ORACLE Database* guide.

### Install a Dialog Instance

Install a dialog instance as described in *SAP R/3 Installation on UNIX-ORACLE Database* guide.

### Take a Full Backup

Use the DIGITAL UNIX command `vdump` to make backups of the disks. The backup will run for approximately 45 minutes.

When it is completed,  
As root: `# <Ctrl>D`  
As tcradm: `startsap`

---

## 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, system limits and characterization data, and the test process.

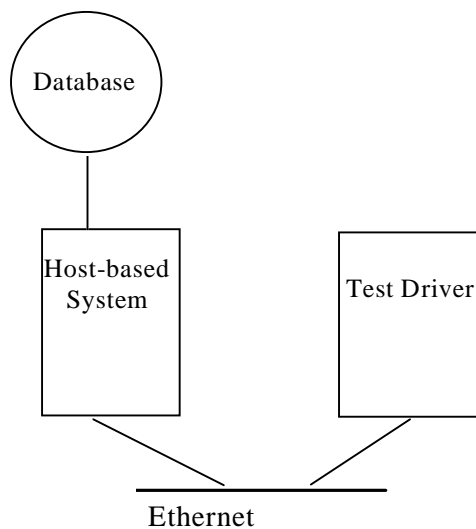
### Overview of Results

Interoperability testing was performed successfully on the SAP Oracle DIGITAL UNIX AlphaServer 4100 Family HiTest Suite.

### Test Environment

Figure 4-1 shows the SAP test environment.

**Figure 4-1: Test Environment**



### Test Tools

The following test tools were used for interoperability testing:

- *ftp* and *tar* to move the client data file to the driver and expand it
- *benchinst* to create the structure of the simulation directory tree on the driver
- *cleandb* and *impsrc* to import the client data into the database on the HiTest system and change some source code
- *mmpv* (period shifter) to bring the booking period of the SAP transactions into the current month (must be rerun at import and at the start of every month)

The following test tools were used to create the load and measure the behavior of the system:

- *mkapl* to define the load parameters (number of users, number of loops)
- *mksim* to create all scripts and additional directories for a load
- *benchrun* to start one load
- *vmubc* to watch the overall CPU and memory behavior of the HiTest system
- *iostat* to watch the disk behavior
- R/3 transaction ST02 to watch the memory behavior of R/3
- R/3 transaction SM50 to watch the behavior of the various R/3 processes

### Test Configuration

To stress test the HiTest configuration and to prove its viability, a standardized SAP benchmark method is being used. To put a meaningful load onto the HiTest System, the following conditions must be met:

- A second system (called driver) is connected to the DB and Application Server through a FDDI connection that is able to connect to the virtual hostnames.
- The driver simulates the user load with the help of SAP-written scripts and executables. This benchmark environment is available for all customers if a person from the specific Competence Center is available and runs the tests.

---

#### Note

---

Do not use this benchmark software in Production Environments. You will get no support from SAP.

---

- Get the benchmark software from SAP network together with the newest VERY\_IMPORTANT.doc. All Competence Centers know the location of this Kit. Together with the kit you get three descriptions:
  1. Installation of the SAP R/3 benchmark
  2. Hints for the SAP R/3 benchmark
  3. Executing the SAP R/3 benchmark
- Create a user on the driver who will drive the benchmark and modify the environment. Check and modify the network so that all systems can connect to each other.

Unpack the benchmark tar file.

## **System Limits and Characterization Data**

It was not in the scope of our testing to specifically determine system limitations or provide comprehensive performance characterization. The focus was a functional testing in a typical client situation.

Sizing information can be found at:

<http://www.fra.dec.com/SAP-Cc/Intranet/sizing/sizingliste.html>

## **Test Process and Results**

We used the standard SAP benchmark.



---

## 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.

The following problems were identified:

### Hardware Installation

<b>Problem</b>	When tested, the firmware was new and a prerelease. Crashes occurred when stressing the machines.
<b>Solution</b>	Ensure that the revision of the backplane is B06 and the SRM console firmware is X4.9-8 or later.

### Operating System Installation

#### lsm:v0liod: cannot open /dev/voliiod

<b>Problem</b>	<pre>Alf5&gt; volsetup lsm:voliiod: cannot open /dev/voliiod: No such device or address Approximate maximum number of physical disks that will be managed by LSM ? [10] Fatal errors prevent /usr/sbin/volsetup from continuing. Stop.</pre>
<b>Solution</b>	<p>If you encounter this error, check the /sys/conf/&lt;HOSTNAME&gt; file and add the following pseudo devices:</p> <pre>pseudo-device  lsm_ted  0 pseudo-device  lsm      1</pre> <p>Then create a new kernel:</p> <pre># doconfig -c &lt;HOSTNAME&gt;</pre>

#### Directory /usr/users not found

<b>Problem</b>	During the installation of the Central Instance the R\$INST will fail with the following error during the phase “Creating UNIX Users”: Directory /usr/users not found.
<b>Solution</b>	Create the directory and use it as the parent directory for R/3 Administrator.

## Cannot Change /sapcd/DEC/INSTALL

- Problem** During R/3 Installation in the phase "copy RDBMS SW" the procedure prints:  
Cannot change to /sapcd/DEC/INSTALL
- Solution** Check logfile R3INST.log, exit R3INST and restart again.  
The fault came from the function "change cd-mountpoint with R3INST-assistance."  
Short printout of R3INST.log:  
1997-May-28 10:11:11 I exit\_on\_label 4 Continuing with  
incorrect CD-LABEL  
1997-May-28 10:11:11 E ik011\_cd\_to\_exe 3 Cannot change to  
/sapcd/DEC/INSTALL  
1997-May-28 10:11:14 E ik011\_check\_instmdir 3 Copying templates  
from CD failed !  
1997-May-28 10:11:15 E ik011\_adapt\_user 3 Installation  
templates from Kernel CD are missing !

## 1 end unsuccessfully

- Problem** During R/3 Installation in the phase "DB Load" the procedure prints:  
Out of 1 started processes did 1 end unsuccessfully
- Solution** You forgot to install Oracle NETV2.  
See *R/3 Installation on UNIX - ORACLE Database*.

## 0 entries in TCPDB

- Problem** If you check the SAP R/3 installation and you take a look at the syslog with  
transaction SM21, you will see the following error:  
In table TCPDB are 0 entries.
- Solution** Apply SAP note 15023.

## APPL-SERVER not found

- Problem** During the installation of the Dialog Instance on the Application Server the  
R3INST will fail with the following error:  
Expected line [APPL-SERVER] not found.
- Solution** Do not use the installation directory, which you have used to install Central  
Instance.

## Oracle Installation

### Failure during check of directories

- Problem** During SAP R/3 installation in phase "R/3 Installation on UNIX Oracle Database"  
the R3INST will fail during check of directories.
- Solution** Create directory /oracle/stage/stage\_733 and do not use the default value  
oracle/stage/stage\_723 as shown on page 4-7.

## orainst Compile Errors

- Problem** During orainst, a few errors appeared about compiling.
- Solution** Check that: /tmp is larger than 75 MB or use different temporary file system.



## local bin Directory

- Problem** During run of root.sh the system is asking for the path of the “local bin directory.” The default is /usr/local/bin but it has to exist.
- Solution** If you answer with default, you have to create the directory bin manually.
- ```
# mkdir /usr/local/bin
```

## Testphase

### No connect to the database

- Problem** During the installation of the benchmark environment you cannot connect the database from the driver system. You can test the connection with:
- ```
R3trans -d
```
- You will see the following error in the local directory in file trans.log, which is created during connection:
- ```
2EETW169 no connect possible: "DBMS = ORACLE --- ORACLE_SID = 'SDR' "
```
- Solution** The variable db\_s\_ora\_tnsname is not set. Do that in the \$HOME/.cshrc file of the benchmark user.
- ```
Setenv db_s_ora_tnsname = SDR
```

### ORA-1631

- Problem** During the operation the error appeared:
- ```
ora-1631 max extends reached in table <table name>
```
- Solution** Increase storage value of the particular table with SAPDBA to 505 (max. value Rel. 3.1H)

### ORA-1632

- Problem** ora-1632 max extends reached in index <index name>
- Solution** Increase storage value of the particular index with SAPDBA to 505 (max. value Rel. 3.1H)

### ORA-1653

- Problem** ora-1653 unable to extend table <table name> in table space <table space name>
- Solution** Add new data file for this tablespace with SAPDBA.

## Unable to Obtain Requested Swapspace

- Problem** During start up of R/3 the following error appears on the console terminal:
- ```
“unable to obtain requested swapspace”
```
- This error can occur after a memory upgrade.
- Solution** Add more swap space; add a disk.

## Problems and Solutions

### Benchinst fail

- Problem** The benchinst during installation of the benchmark environment will fail when compiling the file benchrun.c. This is an error in the SAP CAR tool, which is nearly similar to the UNIX tar.
- Solution** Cd /\$SIMDIR/src  
vi benchrun.c  
goto line 374  
remove the \* at the end of the line  
save the file  
restart the benchinst

### Perl is needed

- Problem** Since R/3 3.1H and the equivalent benchmark software 3.1H, the command language Perl is used to run the benchmark software either on UNIX or on NT. Perl is not available on standard UNIX and NT systems.
- Solution** Get Perl (Perl15003setld.tar) from the following web site:  
ftp://ftp.digital.com/pub/Digital  
If you have untared and installed it with setld, you can check the version.  
# perl -v  
This is perl, version 5.003 with EMBED  
build under dec\_osf at Sep 20 1996 13:47:02  
+ suidperl security patch  
  
Copyright...

### Cleandb fail

- Problem** The cleandb during installation of the benchmark environment will fail with the following error:  
/\$SIMDIR/mandt/mandt\_exp not found.
- Solution** Go to this directory and create a softlink from mandt\_exp.31H to mandt\_exp and restart cleandb.  
# ln -s mandt\_exp.31H mandt\_exp

### Unable to extend table SAPR3.MDKP

- Problem** Error during cleandb in the \$SIMDIR/tmp/import900.log  
Unable to extend table SAPR3.MDKP by 1280 in tablespace PSAPBTABD.
- Solution** Add new datafile for tablespace PSAPBTABD with sapdba.

### Impsrc fail

- Problem** The impsrc fail during installation of the benchmark environment with the following error:  
/\$SIMDIR/mandt/mandt\_exp\_source not found
- Solution** Go to this directory and create a softlink from mandt\_exp\_source.31H to mandt\_exp\_source and restart impsrc.  
# ln -s mandt\_exp\_source.31H mandt\_exp\_source

## Mmpv fail

- Problem** The mmpv during installation of the benchmark software will fail with the following error in a SAP icon.  
SAPGUI Icon: This failure should be handled by the caller of DPTM-layer
- Solution** The variable SAPRELEASE is not set to 31H.  
Set this variable in \$HOME/.cshrc of the benchmark user and restart mmpv.

## Mess-tools not started

- Problem** The benchrun during the run of benchmark will not start the mess-tools.  
The name 'mess' is coming from the German word 'Messung', that means measurement.
- Solution** Do *not* use the hosttype PR in the apl file of the local simulation directory.  
This is not supported.



---

## Detailed Hardware Configuration

This chapter provides a system diagram of the HiTest Suite and also describes the minimum and maximum hardware configuration for the following:

- System Diagram
- HiTest System Slot Configuration
- Input/Output Slot Usage

## System Diagram

Figure 6-1 shows a diagram of the HiTest Suite and Table 6-1 lists the major cables.

Figure 6-1: System Diagram

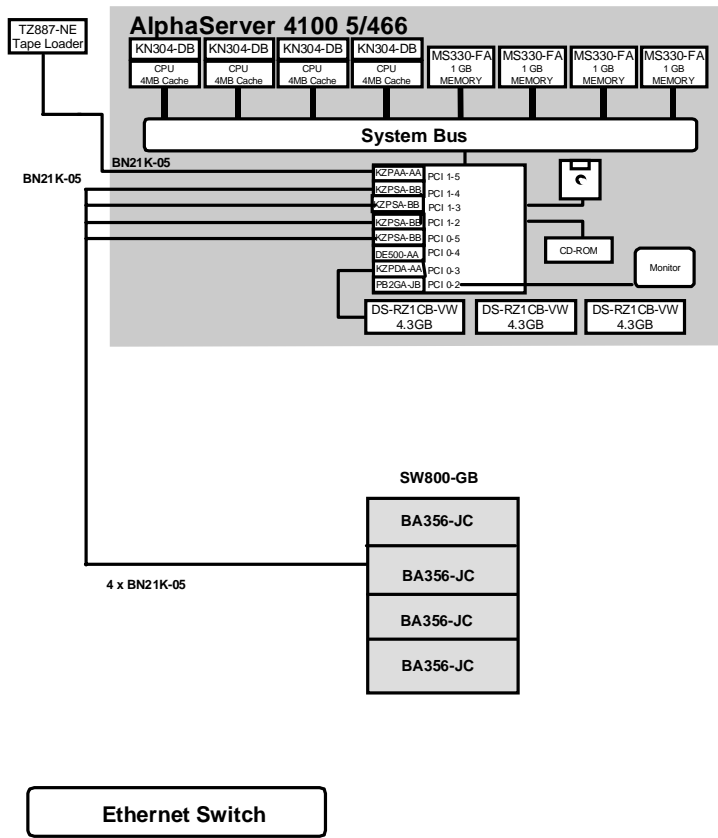


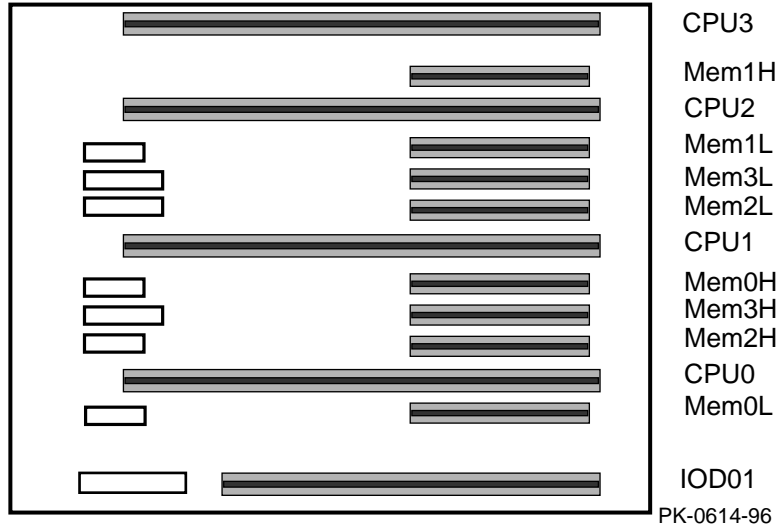
Table 6-1: Configuration Cabling

Part Number	Qty	Description	From	To
BN21K-05	4	SCSI bus	KZPSA-BB	DWZZB-VW
BN21K-02	1	SCSI bus	KZPDA-AA	BA356-JA

## HiTest System Slot Configuration

Figure 6-2 shows the HiTest System Slot Usage and Table 6-2 describes the minimum and maximum hardware configurations used in this HiTest Template.

**Figure 6-2: HiTest System Slot Usage**



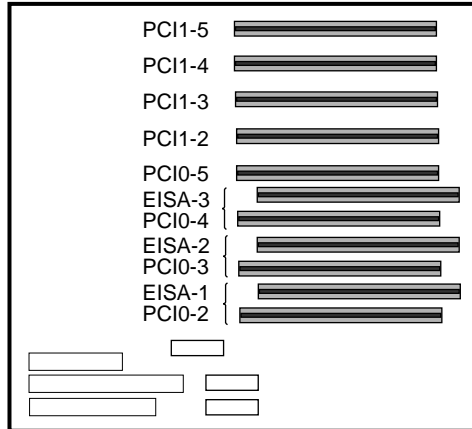
**Table 6-2: System Slot Usage (Minimum and Maximum Configurations)**

Slot	Minimum Options	Maximum Options	Description
CPU3	open	KN304-DB	466 MHz CPU 4 MB cache
Mem1H	open	MS330-FA	Memory pair 1 (2 of 2)
CPU2	open	KN304-DB	466 MHz CPU 4 MB cache
Mem1L	open	MS330-FA	Memory pair 1 (1 of 2)
Mem3L	open	open	
Mem2L	open	MS330-FA	Memory pair 2 (1 of 2)
CPU1	open	KN304-DB	466 MHz CPU 4 MB cache
Mem0H	MS320-FA	MS330-FA	Memory pair 0 (2 of 2)
Mem3H	open	open	
Mem2H	open	MS330-FA	Memory pair 2 (2 of 2)
CPU0	KN304-BC	KN304-DB	466 MHz CPU 4 MB cache
Mem0L	MS320-FA	MS330-FA	Memory pair 0 (1 of 2)
IOD01	Bridge	Bridge	System bus to PCI bus bridge module

## Input/Output Slot Usage

Figure 6-3 and Table 6-3 shows the input/output (I/O) slot usage for the minimum and maximum configurations of this HiTest Template.

**Figure 6-3: I/O Slot Usage**



ML013980

**Table 6-3: I/O Slot Usage (Minimum and Maximum Configurations)**

Slots	Minimum Configuration Options	Maximum Configuration Options	Description
PCI1-5	KZPAA-AA	KZPAA-AA	SCSI-2 controller
PCI1-4		KZPSA-BB	FWD SCSI controller
PCI1-3		KZPSA-BB	FWD SCSI controller
PCI1-2	KZPSA-BB	KZPSA-BB	FWD SCSI controller
PCI0-5		KZPSA-BB	FWD SCSI controller
EISA-3/ PCI0-4	DE500-AA	DE500-AA	Ethernet controller
EISA-2/ PCI0-3	KZPDA-AA	KZPDA-AA	FWSE SCSI controller
EISA-1/ PCI0-2	PB2GA-JB	PB2GA-JB	TRIO64 Graphics