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SAP SQL Server
Windows NT AlphaServer 4100

DIGITAL HiTest Notes

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Preface

This document provides an overview of DIGITAL HiTest Suites and detailed technical information about the SAP SQL Server Windows NT 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*.

Please reference the complete document title and part number (EK-HSPNA-HN. A01) 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 4100 Series Server System Reference Manual* (Part Number: ER-B40WW-UA)
- *Storage Works Array Controllers: HS Family of Array Controllers Users Guide* (EK-BA370-UG.EFT)
- *CLI Reference Manual* (EK-CLI70-RM.A01)
- *R/3 Installation on Windows NT Microsoft SQL-Server Database* (SAP-Nr. 51001731)

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 or WWW Serving and mail administration.

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 2.

DIGITAL HiTest Suite Components

The SAP SQL Server Windows NT AlphaServer 4100 HiTest Suite contains two groups of components: the *DIGITAL HiTest Foundation* and the *DIGITAL HiTest AppSet*.

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 low to medium SAP 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.

2
Configuration Data

This chapter describes the SAP SQL Server Windows NT AlphaServer 4100 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 SQL Server Windows NT AlphaServer 4100 HiTest Suite. This is the DIGITAL HiTest Template. This HiTest system ranges from one to seven CPUs, one to four GB of memory, a RAID Array 7000 subsystem, one through seven internal 4.3 GB disks, six through twelve 4.3 GB disks, six through twelve 9.1 GB disks, and an optional tape drive.

Table 2-2 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 R/3.
- 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 SQL Server Windows NT AlphaServer 4100 DIGITAL HiTest Template

SAP HiTest AppSet SQL Server Windows NT AlphaServer 4100 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	**SAP R/3 Version 3.1H** For more information, contact SAP at: `http://www.sap.com`		1	1
Foundation Hardware				
2	*Select one system:* **AlphaServer 4100 5/466, 2 GB, DIGITAL NT License** **AlphaServer 4100 5/400, 2 GB, DIGITAL NT License** *Hardware includes*: • 5/466 MHz CPU with 4 MB cache • Memory • PB2GA-JB TRIO64 1 MB Graphics • DE500-AA 10/100 Mbit Fast Ethernet • KZPDA-AA FW SCSI and cable • SCSI CD-ROM drive • RX23L-AB 1.44 MB Floppy drive • LK47W-A2 PS/2 style keyboard • Three-button PS/2 compatible mouse *Software includes*: • NT Operating System and base license • Unlimited User license • ServerWORKS	**DN-51JAC-GB** **DN-51HAC-GB**	1	1
3	**Pedestal**	**BA30P-AA** ❶	1	1
4	**Single-bus UltraSCSI StorageWorks shelf**	**BA36R-SD** ❶	1	1
5	**466 MHz CPU DIGITAL NT SMP UPG**	**KN304-DD**	0	6
6	**512 MB Memory Option** **1 GB Memory Option** **2 GB Memory Option** **Note:** This HiTest Template supports a memory range from 1 to 4 GB. When selecting memory options, stay within the Template's 4 GB maximum. The 4100 holds four memory options; the 4000, two.	**MS330-EA** **MS330-FA** **MS330-GA**	0	See Note
7	**Country kit** (accessories, keyboard, docs, mouse, and power cord)	**FR-PCA6K-** ❶	1	1
8	**PCI one-port ultra wide SE SCSI controller**	**KZPBA-CB**	1	1
9	**PCI one-port FWD SCSI controller**	**KZPSA-BB**	1	1
10	**2 meter 16-bit SCSI cable (internal)**	**BN21K-02**	1	1
11	**5 meter 16-bit SCSI cable (internal)**	**BN21K-05**	1	1
12	**4 meter 10-base-T unshielded TP cable**	**BN25G-04**	1	1
13	**PCI 10/100 Mbit Ethernet controller**	**DE500-BA**	1	1
14	**PCI to FDDI Adapter, single attachment**	**DEFPA-AB**	1	1
15	**2 meter VHDCI male to 68HD male**	**BN38C-02**	1	1
❶ Indicates that geography-specific part number variants are available. Check the appropriate price book for details.				

SAP HiTest AppSet SQL Server Windows NT AlphaServer 4100 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**
16	**1 meter VHDCI mail to HD68 UltraSCSI**	**BN38B-01**	1	1
17	**RAID Array 7000 Hardware Subsystem** *Includes*: • Dual HSZ70 with 64 MB mirrored write-back cache each • Dual cache battery in SSB with cable	**DS-SWXRA-HA**	1	1
18	**RAID Array 7000 Platform Kit**	**QB-5SBAD-SB**	1	1
19	**4.3 GB 7200 RPM UltraSCSI Disks**	**DS-RZ1CB-VW**	6	12
20	**4.3 GB 7200 RPM UltraSCSI Disks** (internal disks) **Note:** This part number replaces RZ29B-VW, which was used for testing this HiTest Suite.	**DS-RZ1CB-VW**	1	7
21	**9.1 GB 7200 RPM UltraSCSI Disks**	**DS-RZ1DB-VW**	6	12
22	**Automated DLT Tape Library**	**DS-TL891-NE**	0	1
23	*Select one high-resolution color monitor (the 17 inch is recommended):* **15" flat-square 0.28 dot pitch** **17" flat-square 0.28 dot pitch**	 **FR-PCXBV-EZ**ⓘ **FR-PCXBV-FZ**ⓘ	1	1
ⓘ Indicates that geography-specific part number variants are available. Check the appropriate price book for details.				

SAP HiTest AppSet SQL Server Windows NT AlphaServer 4100 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**	**Required By**	
			Fdn	**App**
Foundation Software				
24	**Windows NT Server, Version 4.0** Please purchase from a Microsoft reseller or contact Microsoft at `http://www.microsoft.com`		Yes	Yes
25	**Windows NT Service Pack 3** Please purchase from a Microsoft reseller or contact Microsoft at `http://www.microsoft.com`		Yes	Yes
26	**Microsoft SQL Server 6.5** Please purchase from a Microsoft reseller or contact Microsoft at `http://www.microsoft.com`		Yes	Yes
27	**Microsoft SQL Service Pack 3** Please purchase from a Microsoft reseller or contact Microsoft at `http://www.microsoft.com`		Yes	Yes
28	**Windows NT Resource Kit** Please purchase from a Microsoft reseller or contact Microsoft at `http://www.microsoft.com`		Yes	Yes
29	**System Management Server (SMS) 1.2** Please purchase from a Microsoft reseller or contact Microsoft at `http://www.microsoft.com`		Opt'l	Opt'l
30	**Hard copy of the Suite's HiTest Notes**	**EK-HSPNA-HN**	Yes	Yes

Table 2-2: Component Revision Levels

Hardware Component	Hardware	Firmware	Software
AlphaBIOS		5.63-0	
SRMFLASH		5.0-2	
HSZ70 Array Controller Software	Vers. FX03(E9) Rev. F01	7.0Z-0	
4.3 GB disks (DS-RZ1CB-VW)	A01	LYJ0	–
4.3 GB disks (RZ29B-VW)	B02	DEC0016	–
9.1 GB disk (FR-CFCBA-CA)	A01	LYJ0	–
Fast Ethernet Adapter (FR-DE500-BA)	B01	1.1	–
DS-TL891-NE	A01		
DEFPA-AB	E02		
Software Component	**Version/ Revision**	**Patch Level**	
Windows NT Server	4.0	Service Pack 3 (Build 1381)	
SAP R/3	3.1H	–	
System Management Server	1.2	Service Pack 1 (Build 786)	
ServerWORKS Quick Launch CD	3.2	–	

Special Configuration Rules

There are no special configuration rules for the SAP SQL Server Windows NT AlphaServer 4100.

3
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

The hardware was installed and interconnected as shown in Chapter 6.

AlphaServer System Configuration Utility (SCU)

If PCI or EISA options are added to the system, run the SCU to configure them.

See Chapter 2 of the *AlphaServer 4100 Series Server System Reference Manual*.

Operating System Installation

This section describes the operating system installation.

Disk Storage Configuration

This section describes disk storage configurations for the SAP SQL ServerWindows NT AlphaServer 4100. SAP recommends using RAID hardware.

For the internal disk:

1. Use at least one disk in the internal shelf, that is connected to the KZPDA.
   This system disk can be formatted with FATFS (FAT file system) using the AlphaBIOS with the command:
   `convert` *`drive`* `/FS:NTFS.`
2. Build a small system partition (6 MB) and a big partition (4085 MB) to install NT.
3. After NT is installed, the big partition should be converted to NTFS.

HSZ70 Installation

After the HSZ70 has been powered on, enter the following commands from the terminal attached to the HSZ70 to create and verify the controller configuration:

Note

Refer to the *StorageWorks Array Controllers: HS Family of Array Controllers Users Guide* and *CLI Reference Manual* for a complete description of the HSZ70 configuration procedures.

1. Connect to the first HSZ70.
2. Check disk layout:
```
HSZ> show device
```
3. If no disk is seen or disks are added after the config of the HSZ, you have to run either run *config* or run *cfmenu*, whereby *cfmenu* is menudriven. *Config* automatically adds all known disks.
4. Setup HSZ to enable the failover dual redundancy:
```
HSZ> set this prompt="HSZ70_1> "
HSZ70_1> set this time=14-NOV-1997:11:00:00
HSZ70_1> set failover copy = this
HSZ70_1> set this id = 1,2,3,4
HSZ70_1> set this PREFERRED_ID = 1,2
HSZ70_1> set this mirroed_cache
HSZ70_1> set this command_console_lun
HSZ70_1> set this host_function = D
```
   The command command_console_lun creates a LUN for the HSZ term or the SWCC. You will see one more disk in console mode on the system, which is created automatically and looks like the following:
```
dkc102.1.0.2.1DKc102HSZ 70CCLV70Z
```
5. Connect to second HSZ70.
6. Setup second HSZ to enable the failover:
```
HSZ> set this prompt="HSZ70_2> "
HSZ70_2> set nofailover
HSZ70_2> set this id = 1,2,3,4
HSZ70_2> set this PREFERRED_ID = 3,4
HSZ70_2> restart other
HSZ70_2> restart this
```
7. Verify the first HSZ70:
```
HSZ70_1> show this
Controller:
        HSZ70 ZG71200349 Firmware V70Z-0, Hardware FX03
        Configured for dual-redundancy with ZG71200346
            In dual-redundant configuration
        Device Port SCSI address 7
          Time: 13-NOV-1997 10:01:23
  Host port:
          SCSI target(s) (1, 2, 3, 4)
```

```
        Preferred target(s) (1, 2)
        TRANSFER_RATE_REQUESTED = 20 MHZ
        Host Functionality Mode = A
        Command Console LUN is disabled
Cache:
        64 megabyte write cache, version 4
        Cache is GOOD
        Battery is GOOD
        No unflushed data in cache
        CACHE_FLUSH_TIMER = DEFAULT (10 seconds)
        NOCACHE_UPS
Mirrored Cache:
        64 megabyte write cache, version 4
        Cache is GOOD
        Battery is GOOD
        No unflushed data in cache
```

8. Verify the second HSZ70:

```
HSZ70_1>show other
Controller:
        HSZ70 ZG71200346 Firmware V70Z-0, Hardware FX03
        Configured for dual-redundancy with ZG71200349
            In dual-redundant configuration
        Device Port SCSI address 6
        Time: 13-NOV-1997 10:03:19
Host port:
        SCSI target(s) (1, 2, 3, 4)
        Preferred target(s) (3, 4)
        TRANSFER_RATE_REQUESTED = 20MHZ
        Host Functionality Mode = A
        Command Console LUN is disabled
Cache:
        64 megabyte write cache, version 4
        Cache is GOOD
        Battery is GOOD
        No unflushed data in cache
        CACHE_FLUSH_TIMER = DEFAULT (10 seconds)
        NOCACHE_UPS
Mirrored Cache:
        64 megabyte write cache, version 4
        Cache is GOOD
        Battery is GOOD
        No unflushed data in cache
```

9. Check the disk layout:

```
HSZ70_1>sho dev
Name          Type                      Port Targ  Lun
Used by
-------------------------------------------------------------
DISK10000     disk                         1    0    0
DISK10100     disk                         1    1    0
DISK10200     disk                         1    2    0
DISK10300     disk                         1    3    0
DISK20000     disk                         2    0    0
DISK20100     disk                         2    1    0
```

```
DISK20200     disk                          2    2    0
DISK20300     disk                          2    3    0
DISK30000     disk                          3    0    0
DISK30100     disk                          3    1    0
DISK30200     disk                          3    2    0
DISK30300     disk                          3    3    0
DISK40000     disk                          4    0    0
DISK40100     disk                          4    1    0
DISK40200     disk                          4    2    0
DISK40300     disk                          4    3    0
DISK50000     disk                          5    0    0
DISK50100     disk                          5    1    0
DISK50200     disk                          5    2    0
DISK50300     disk                          5    3    0
DISK60000     disk                          6    0    0
DISK60100     disk                          6    1    0
DISK60200     disk                          6    2    0
DISK60300     disk                          6    3    0
HSZ70_1>
```

10. Configure the stripesets:

```
HSZ70_1>add mirror m1 disk10000 disk20000
HSZ70_1>add mirror m2 disk10100 disk20100
HSZ70_1>add mirror m3 disk10200 disk20200
HSZ70_1>add mirror m4 disk10300 disk20300
HSZ70_1>add mirror m5 disk30300 disk40300
HSZ70_1>add mirror m6 disk30200 disk40200
HSZ70_1>add mirror m7 disk50300 disk60300
HSZ70_1>add mirror m8 disk50200 disk60200
HSZ70_1>add mirror m9 disk30100 disk40100
HSZ70_1>add mirror m10 disk30000 disk40000
HSZ70_1>add mirror m11 disk50100 disk60100
HSZ70_1>add mirror m12 disk50000 disk60000
HSZ70_1>add stripe s1 m9 m10 m11 m12
HSZ70_1>add stripe s2 m5 m6 m7 m8
HSZ70_1>
HSZ70_1>init s1 chunksize=32 save_configuration
HSZ70_1>init s2 chunksize=32 save_configuration
HSZ70_1>init m1 save_configuration
HSZ70_1>init m2 save_configuration
HSZ70_1>init m3 save_configuration
HSZ70_1>init m4 save_configuration
```

11. Add the following units:

```
HSZ70_1> add unit d100 s1 writeback_cache maximum_cached_transfer=32
HSZ70_1> add unit d101 m1 writeback_cache maximum_cached_transfer=32
HSZ70_1> add unit d200 s2 writeback_cache maximum_cached_transfer=32
HSZ70_1> add unit d201 m2 writeback_cache maximum_cached_transfer=32
HSZ70_1> add unit d301 m3 writeback_cache maximum_cached_transfer=32
HSZ70_1> add unit d401 m4 writeback_cache maximum_cached_transfer=32
```

12. Verify the configuration:

```
HSZ70_1>sho unit
    LUN                                              Uses
------------------------------------------------------------
  D100                                               S1
  D101                                               M1
  D200                                               S2
  D201                                               M2
  D300                                               S3
  D301                                               M3
  D400                                               S4
  D401                                               M4

HSZ70_1>show disk
Name          Type                       Port Targ  Lun        Used
------------------------------------------------------------------
DISK10000     disk                          1    0    0        M1
DISK10100     disk                          1    1    0        M2
DISK10200     disk                          1    2    0        M3
DISK10300     disk                          1    3    0        M4
DISK20000     disk                          2    0    0        M1
DISK20100     disk                          2    1    0        M2
DISK20200     disk                          2    2    0        M3
DISK20300     disk                          2    3    0        M4
DISK30000     disk                          3    0    0        S1
DISK30100     disk                          3    1    0        S2
DISK30200     disk                          3    2    0        S3
DISK30300     disk                          3    3    0        S4
DISK40000     disk                          4    0    0        S1
DISK40100     disk                          4    1    0        S2
DISK40200     disk                          4    2    0        S3
DISK40300     disk                          4    3    0        S4
DISK50000     disk                          5    0    0        S1
DISK50100     disk                          5    1    0        S2
DISK50200     disk                          5    2    0        S3
DISK50300     disk                          5    3    0        S4
DISK60000     disk                          6    0    0        S1
DISK60100     disk                          6    1    0        S2
DISK60200     disk                          6    2    0        S3
DISK60300     disk                          6    3    0        S4
```

Windows NT Installation

The AlphaBIOS on the AS 4100 supports the installation of Windows NT from CD-ROM.

Perform the following steps to install the Windows NT Server (steps where only a confirmation is requested are not mentioned):

1. Insert the Windows NT Server CD-ROM and power up your system.
2. Press F2 to enter AlphaBIOS Setup.
3. AlphaBIOS setup:
   a) Choose hard disk setup.
   b) Select the disk, where NT is to be installed.

c) Press `F7` for express disk setup.
This creates:
```
Partition 1 : 4085 MB FAT
Partition 2 : 6 MB FAT
```

d) Leave hard disk setup.

4. Choose install Windows NT, this starts the NT setup.

5. Mass storage detection:

   a) Press s to specify additional device.

   b) Select other.

   c) Insert floppy disk with NT 4.0 drivers for KZPSA.

6. Create disk partitions:

   a) Select the previously created 4 GB partition.

   b) Leave current file system intact.

7. Gather Information about your computer with the graphical user interface of the NT Setup:

a)	name and organization	enter proper value
b)	registration	enter CD key
c)	licensing model	select a model
d)	computer name	enter name
e)	server type	select standalone server
f)	administrator account	enter password
g)	emergency repair disk	create one
h)	select components	select needed components

8. Install Windows NT Networking:

a)	wired to a network	`yes`
b)	MS IIS	install of needed
c)	network adapter	click `search`
d)	network protocol	R/3 requires only TCP/IP
e)	TCP/IP properties	configure TCP/IP
f)	Domain / Workgroup	enter proper value

9. Finishing Setup:

   a) If previously selected, install MS IIS now.

   b) Date/Time Properties — select timezone, adjust date/time

   c) Display properties — select a display mode

10. After a reboot, you can convert your partition to NTFS.

SAP R/3 Installation

This section describes how to install the AppSet software.
Install SAP R/3 as follows:

1. Follow the *SAP Installation Guide R/3 Installation on Windows NT Microsoft SQL-Server Database.*
2. Be sure to have the latest OSS (R/3 Online Service System) notes mentioned in Chapter 1 of the SAP Installation Guide.

4
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.

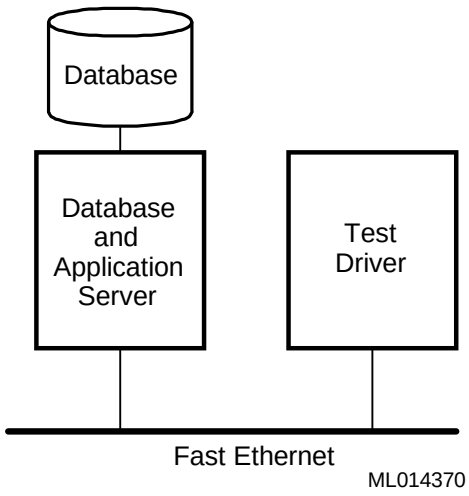
Overview of Results

Interoperability testing was performed successfully on the SAP SQL Server Windows NT AlphaServer 4100 HiTest Suite.

Test Environment

Figure 4-1 shows the SAP R/3 SQL Server Windows NT AlphaServer 4100 test environment.

Figure 4-1: Test Environment



Test Tools

The following tools were used for interoperability testing:

- *ftp* to move the benchmark kit to the driver and the central instance.
- *car* to unpack the kit.
- *cleandb* to import the benchmark clients.
- *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).

A couple of manual steps were necessary to setup the benchmark environment. They are described in *hints.htmli* in the documentation directory of the benchmark.

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.
- *Performance monitor* to watch the overall CPU, memory and disk behavior of the HiTest system.
- 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 Central System 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.
- 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. (It is self-extracting.)
- SMS performed routine auditing tasks during the test.

Minimum Configuration

The minimum configuration included four disks as stripeset and two disks as mirror as shown in Table 4-1.

Table 4-1: 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
s1	3 mirror	m4,m5,m6	Data for SQL Server	RAID 0+1	
m1	2	disk10100 – Bus1 disk20100 – Bus2	Transaction log SQL Server	RAID 1	4.3 GB
m2	2	disk10200 – Bus1 disk20200 – Bus2	Tempdb- SAP Instance	RAID 1	4.3 GB
m3	2	disk10300 – Bus1 disk20300 – Bus2	SQL Server Exes	RAID 1	4.3 GB
m4	2	disk30100– Bus3 disk40100– Bus4	SQL Server datafile 1,SQL Server disk backup	RAID 1	9.1 GB
m5	2	disk30000– Bus3 disk40000– Bus4	SQL Server datafile 1,SQL Server disk backup	RAID 1	9.1 GB
m6	2	disk50100– Bus5 disk60100– Bus6	SQL Server datafile 1,SQL Server disk backup	RAID 1	9.1 GB
					Usable Total: **40.2 GB**

Maximum Configuration

The maximum configuration included five disks as stripeset and two disks as mirror as shown in Table 4-2.

Table 4-2: 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
s1	4 mirror	m9,m10,m11,m12	Data for SQL Server	RAID 0+1	
s2	4 mirror	m5,m6,m7,m8		RAID 0+1	
m1	2	disk10000 – Bus1 disk20000 – Bus2	Transaction log SQL Server	RAID 1	9.1 GB
m2	2	disk10100 – Bus1 disk20100 – Bus2	Transaction log SQL Server	RAID 1	9.1 GB
m3	2	disk10200 – Bus1 disk20200 – Bus2	Tempdb- SAP Instance	RAID 1	4.3 GB
m4	2	disk10300 – Bus1 disk20300 – Bus2	SQL Server Exes	RAID 1	4.3 GB
m5	2	disk30300– Bus3 disk40300– Bus4	SQL Server datafile 2	RAID 1	4.3 GB
m6	2	disk30200– Bus3 disk40200– Bus4	SQL Server datafile 2	RAID 1	4.3 GB
m7	2	disk50300– Bus5 disk60300– Bus6	SQL Server datafile 2	RAID 1	4.3 GB
m8	2	disk50200– Bus5 disk60200– Bus6	SQL Server datafile 2	RAID 1	4.3 GB
m9	2	disk30100– Bus3 disk40100– Bus4	SQL Server datafile 1,SQL Server disk backup	RAID 1	9.1 GB
m10	2	disk30000– Bus3 disk40000– Bus4	SQL Server datafile 1,SQL Server disk backup	RAID 1	9.1 GB
m11	2	disk50100– Bus5 disk60100– Bus6	SQL Server datafile 1,SQL Server disk backup	RAID 1	9.1 GB
m12	2	disk50000– Bus5 disk60000– Bus6	SQL Server datafile 1,SQL Server disk backup	RAID 1	9.1 GB
				Usable Total: **80.4 GB**	

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 referred at:
`http://www.fra.dec.com/SAP-Cc/Intranet/sizing/sizingliste.html`

Test Process and Results

The following information describes the test results:

- The SAP R/3 benchmark reported no errors.
- The response times met the SAP criteria for acceptable performance.

5
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.

The following problems were identified:

Foundation Hardware

No problems were encountered.

Foundation Software

No problems were encountered.

AppSet Software

No problems were encountered.

6
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 Configurations
- 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

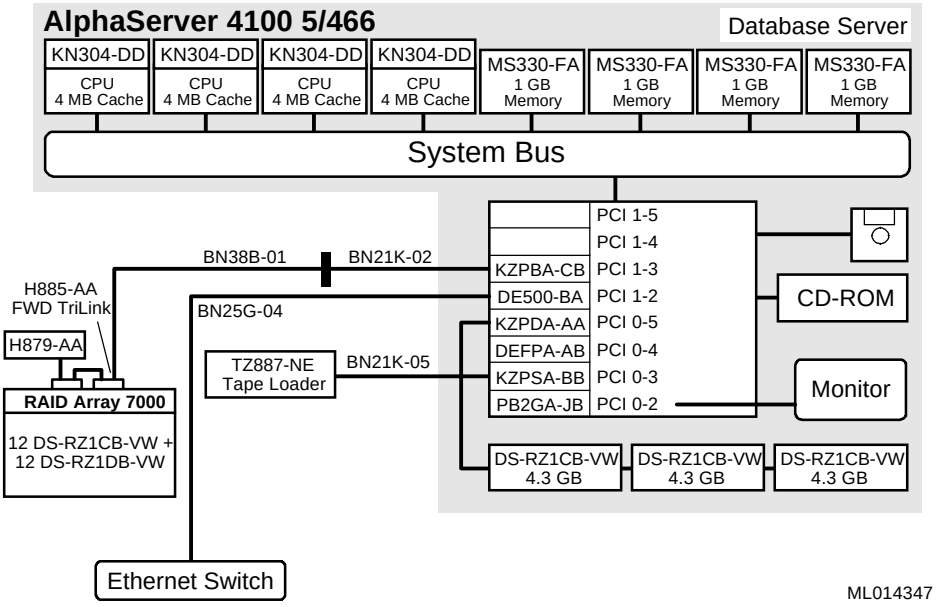


Table 6-1: Configuration Cabling

Part Number	Qty	Description	From	To
BN21K-02	1	SCSI bus	KZPBA-CB	BN38B-01
BN38B-01	1	SCSI bus	BN38B-01	RAID Array 7000
BN21K-05	1	SCSI bus	KZPSA-BB	TL891-NE
BN38C-02	1	SCSI bus	KZPDA-AA	BA36R-SD
BN25G-04	1	SCSI bus	DE500-BA	Ethernet

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

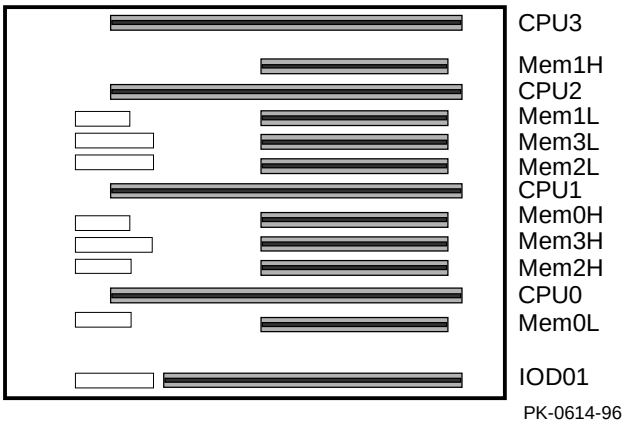


Table 6-2: System Slot Usage (Minimum and Maximum Configurations)

Slot	Minimum Configuration	Maximum Configuration	Description
CPU3	open	KN304-DD	466 MHz CPU 4 MB cache
Mem1H	open	MS330-FA	Memory pair 1 (2 of 2)
CPU2	open	KN304-DD	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-DD	466 MHz CPU 4 MB cache
Mem0H	MS330-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-DD	466 MHz CPU 4 MB cache
Mem0L	MS330-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 show the input/output (I/O) slot usage for the minimum and maximum configurations of this HiTest Template.

Figure 6-3: I/O Slot Usage

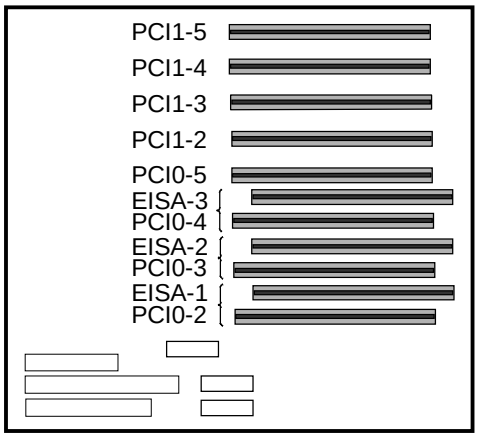


Table 6-3: I/O Slot Usage (Minimum and Maximum Configurations)

Slots	Minimum Configuration	Maximum Configuration	Description
PCI1-5			Not used
PCI1-4			Not used
PCI1-3	KZPBA-CB	KZPBA-CB	FWD SCSI controller
PCI1-2	DE500-BA	DE500-BA	Ethernet controller
PCI0-5	KZSDA-AA	KZPDA-AA	FWD SCSI controller
EISA-3/ PCI0-4	DEFPA	DEFPA	Ethernet controller
EISA-2/ PCI0-3	KZPSA-BB	KZPSA-BB	FWD SCSI controller
EISA-1/ PCI0-2	PB2GA-JB	PB2GA-JB	TRIO64 Graphics