HITACHI
Inspire the Next

Deploying SAP® on Microsoft® SQL Server® 2008 Environments Using the Hitachi Virtual Storage Platform

Implementation Guide

By Sean Siegmund

June 2011

Feedback

Hitachi Data Systems welcomes your feedback. Please share your thoughts by sending an email message to SolutionLab@hds.com. Be sure to include the title of this white paper in your email message.

Table of Contents

Tested Solution Components **3**

Hardware Components 5

Software Components 6

Solution Implementation **8**

Configure the Storage Area Netowrk 8

Configure Storage 10

Configure Management Servers 16

Configure Hitachi Compute Blade 2000 16

Deploy the Windows Server 2008 Operating System 19

Deploy the Microsoft SQL Server 2008 for SAP 20

Deploy SAP Solution Manager Software 20

Deploy SAP ABAP Software 23

Upgrade SAP Kernel and Support Package Stacks 25

Deploying SAP® on Microsoft® SQL Server® 2008 Environments Using the Hitachi Virtual Storage Platform

Implementation Guide

This is an introduction to the basic file system structure that underpins SAP implementations and explains how to use a Hitachi Virtual Storage Platform and Hitachi Compute Blade 2000 server to maximize the value of SAP ERP 6.0 Enhancement Pack 4 SR 1 deployments using Microsoft® SQL Server® 2008 R2 and Microsoft Windows Server® 2008 R2.

It describes the hardware and software required to build the solution and provides links to supporting documentation needed to build, test, and validate the solution. Although this document does not provide step-by-step detailed instructions for each and every task required to deploy the solution, it does provide a consolidated resource where administrators can locate related materials needed to construct a functional solution.

This is written for those individuals at businesses of all sizes that are charged with deploying SAP on the Hitachi Virtual Storage Platform and Hitachi Compute Blade 2000, with Microsoft Windows Server 2008 and Microsoft SQL Server 2008.

Storage administrators need to have a high-level understanding of SAP architecture to ensure that the storage systems meet service level agreements. This paper provides that understanding for storage administrators who are beginning SAP deployments or those who might be attempting to remedy problems in existing deployments.

This white paper assumes the following:

- Familiarity with SAN technologies and tools
- Basic knowledge of Hitachi storage management software, including Hitachi Command Suite and Hitachi Dynamic Link Manager

It does not assume detailed knowledge of SAP's products or architecture. For more information about SAP architecture, see the *Master Guide* at SAP Service Marketplace—Installation Guides which is available to licensed SAP customers.

Tested Solution Components

This solution uses a Hitachi Compute Blade 2000 and Hitachi Virtual Storage Platform as a platform for a SAP ABAP instance. This solution is a basic SAP environment, which includes a SAP Solution Manager instance and a single SAP ABAP instance.

Figure 1 illustrates the Hitachi Data Systems lab environment using a Hitachi Compute Blade 2000 and Hitachi Virtual Storage Platform for a basic SAP environment.

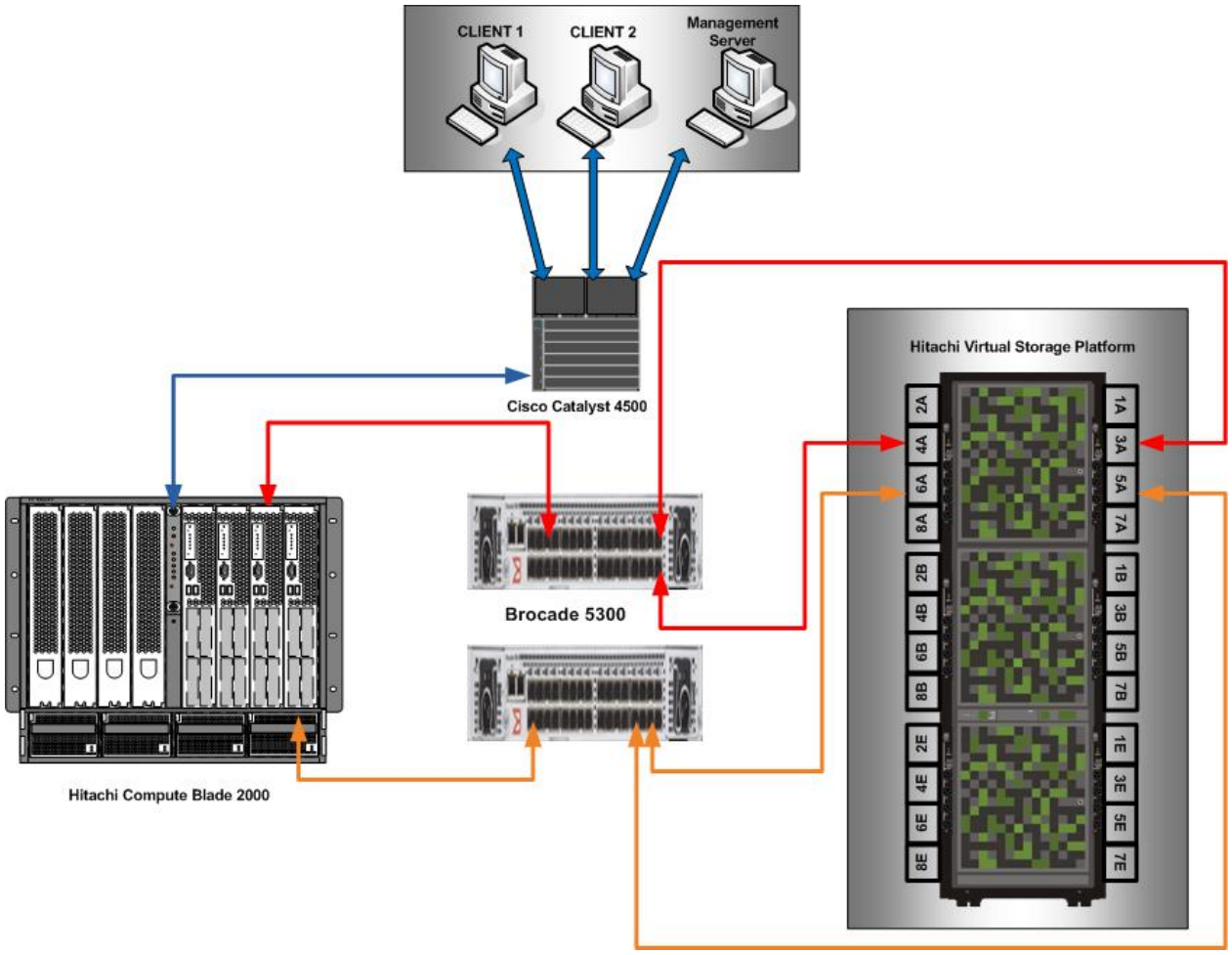

Figure 1

SAP offers numerous architectural designs to maximize performance, and to suit the individual needs of each and every SAP customer. When designing a SAP landscape proper planning is necessary by both the customer and solution implementation partner. This ensures the SAP landscape will be able to accommodate future growth and expected peak performance of the SAP configuration. For more information be sure to consult with your implementation partner, after reading the proper planning guides for SAP ERP 6.0 at the SAP Service Marketplace, available to licensed SAP customers:

- **First Steps Document**—This helps you get started with the installation of the SAP ERP 6.0 instance.
- **Master Guide**—This is the de-facto guide containing information about the sequence and the components available for SAP ERP 6.0. It also contains links to all of the SAP ERP 6.0 documentation from SAP.

Hardware Components

Table 1 describes the hardware used to implement this solution in the Hitachi Data Systems Lab

Table 1. Tested Deployment Hardware

Hardware	*Quantity*	*Configuration*	*Role*
Hitachi Virtual Storage Platform storage system	1	8 Fibre Channel ports used 2 pair of front-end directors 2 pair of back-end directors 64 × 300GB 10K RPM SAS drives 64GB cache	SAP storage system
Hitachi Compute Blade 2000 chassis	1	8-blade chassis 8 fiber channel switch modules 8 × 1GB network ports 2 management modules 8 cooling fan modules 4 power supply modules	
Hitachi Compute Blade 2000 server blade	1	2 × 8 Core processor with 10GB of Ram	SAP Solution Manager Instance
Hitachi Compute Blade 2000 server blade	1	2 × 8 Core processor with 10GB of Ram	SAP ABAP Instance
Brocade 5300 SAN Fibre Channel switch	2	FOS 5.3.1a 14 4Gb Fibre Channel ports used	SAN switch
Server	2	Intel Pentium 3.0GHz processor 1GB memory	SAP clients
Server	1	Intel Pentium 3.0GHz processor 1GB memory	Management server with access to Hitachi Storage Navigator software and NetBackup Administration Console.

Hitachi Virtual Storage Platform

The Hitachi Virtual Storage Platform is a 3D scaling storage platform. With the ability to scale up, scale out, and scale deep at the same time in a single storage system, the Virtual Storage Platform flexibly adapts for performance, capacity, connectivity, and virtualization.

- **Scale Up**—Increase virtual server consolidation, improve utilization of resources, and reduce costs.
- **Scale Out**—Add new physical or virtual servers to your environment to meet business demands.
- **Scale Deep**—Extend the advanced functions of the Hitachi Virtual Storage Platform to external multivendor storage.

The switch matrix architecture of the Virtual Storage Platform makes all of this possible. It connects the basic components, front-end directors, back-end directors, global cache modules, and virtual storage directors. You can add redundant pairs of directors and cache modules, as required, without disruption to connected host servers. All these resources are tightly coupled through a global cache that creates a common pool of storage resources. These resources can include external storage that is connected through front-end director initiator ports.

Hitachi Compute Blade 2000

The Hitachi Compute Blade 2000 is an enterprise-class blade server platform. It features:

- A balanced system architecture that eliminates bottlenecks in performance and throughput
- Embedded logical partition virtualization
- Configuration flexibility

Hitachi embeds logical partitioning virtualization in the firmware of the Hitachi Compute Blade 2000 server blades. This proven, mainframe-class technology combines Hitachi's logical partitioning expertise with Intel VT technologies to improve performance, reliability, and security. Embedded logical partition virtualization does not degrade application performance and does not require the purchase and installation of additional components.

Logical partitions are not used in this tested solution. Currently, SAP and Hitachi Data Systems do not support the use of logical partitions in SAP environments.

SAP Servers

Servers hosting SAP Solution Manager and SAP ERP must meet specification requirements for the SAP solutions they are hosting. For more information about server requirements for SAP ERP, SAP Solution Manager, and SAP clients, see the following SAP Notes and websites, which are available to licensed customers:

- SAP Note 26147, SAP GUI Resources: Hardware and Software
- SAP Note 901070, Resource Requirements for SAPECC6
- SAP Service Marketplace: Sizing

Software Components

Table 2 lists the software used to test this solution in the Hitachi Data Systems lab. Following the table are descriptions of the key software components used in this solution.

Table 2. Tested Deployment Software

Software	*Version*
Hitachi Dynamic Provisioning	Microcode dependent
Hitachi Command Suite	7.0
Hitachi Dynamic Link Manager	6.0.1.0.804
SAP ERP (ABAP instance)	ECC 6.0 Enhancement Package 4 SR1 with Upgraded SAP Kernel
SAP Solution Manager	7.0 Enhancement Package 1 on SP 25
SAP GUI	7.2

Software	Version
Microsoft SQL Server 2008	R2
Microsoft Windows Server 2008	R2

Hitachi Dynamic Provisioning

Hitachi Dynamic Provisioning provides features that provide virtual storage capacity to eliminate application service interruptions, reduce costs, and simplify administration, as follows:

- Optimizes or “right-sizes” storage performance and capacity based on business or application requirements
- Supports deferring storage capacity upgrades to align with actual business usage
- Simplifies and adds agility to the storage administration process
- Improves performance

Hitachi Command Suite

Hitachi Command Suite is an integrated software suite for efficient management of virtualized storage and server infrastructures that lowers capital and operational costs. With new levels of usability, workflow, performance, scalability, and private cloud enablement, Hitachi Command Suite lets IT organizations build sustainable infrastructures with leading storage technologies. It helps you flexibly align with changing business requirements and maximize return on IT investments.

For this solution the Hitachi Command Suite was used to create logical devices (LDEVs) and dynamic pools for the SAP Solution Manager Instance and SAP ERP 6.0 Enhancement Pack 4 ABAP instance. Also, it was used to assign the newly created LDEVs to host groups.

For more information, see the Hitachi Command Suite User Guide shipped with the product.

Hitachi Dynamic Link Manager Advanced

Hitachi Dynamic Link Manager Advanced bundles Hitachi Dynamic Link Manager I/O multi-pathing and Hitachi Global Link Manager. Hitachi Dynamic Link Manager, which is installed on the SAP ERP and SAP Solution Manager, includes capabilities such as path failover and failback and automatic load balancing to provide higher data availability and accessibility.

For more information, see the Hitachi Dynamic Link Manager User’s Guide for Windows Systems shipped with the product.

SAP Software

SAP ERP combines scalable and effective software for enterprise resource planning (ERP) with a flexible, open technology platform that can leverage and integrate SAP and non-SAP systems. SAP provides end-to-end software functionality for enterprise management.

SAP Solution Manager is a service and support platform that provides the integrated content, tools, and methodologies to implement, support, and monitor operations of SAP implementation. Solution Manager is installed on a separate system. Hitachi Data Systems uses the Solution Manager server for these functions:

- Configuring installation keys for the install of any SAP instance
- Approving the download of any updates from SAP like service packs or enhancement packs
- Installing SAP enhancement packs onto ABAP instances
- Obtaining support from SAP

SAP GUI is the client software that allows SAP users to access various functionalities in SAP ABAP instances and SAP Solution Manager.

SAP systems can be used with a variety of databases available from different vendors. The business transactions in SAP systems are processing units grouped to provide specific functions. These processing units execute changes to the database that are consistent.

Microsoft SQL Database

Microsoft SQL Database is a state-of-the-art, high performance database software. For this solution, Hitachi Data Systems used Microsoft SQL Server 2008 Enterprise Edition R2.

Solution Implementation

Deploying this solution requires these following high-level steps:

1. Configure the SAN.
2. Configure storage.
3. Configure Management Servers.
4. Configure Hitachi Compute Blade 2000.
5. Deploy the Windows Server 2008 Operating Systems.
6. Deploy the Microsoft SQL Server 2008 for SAP.
7. Deploy SAP Solution Manager.
8. Deploy SAP ABAP.
9. Upgrade SAP Instances.

Your checklist might vary based on your environment. More information about each of these steps is included in the following sections.

Configure the Storage Area Netowrk

In the tested deployment, all the Hitachi Compute Blade 2000 server blades had a two port Fibre Channel mezzanine cards installed. These cards were connected internally to the internal Fibre Channel switch modules located in the Hitachi Compute Blade 2000 chassis.

Two inter-switch links were connected from the internal Fibre Channel switch modules to the Brocade 5300 switches. Also, the Brocade switches were connected to four ports of the Hitachi Virtual Storage Platform storage system. Each connection was configured with zones on fabric switches, according to the manufacturer's guidelines.

In addition, follow these recommended practices:

- Use world wide port name (WWPN) identification for all zoning configuration.
- Connect a minimum of two HBAs per server for multipath high availability.
- Disable all unused switch ports to increase security.
- Configure ports for point-to-point topology.
- Set ports to a specific speed. Do not use the auto negotiate setting.
- Use single initiator zoning.

When deploying a SAP system made up of SAP Solution Manager and SAP ABAP instances, the storage used by these servers must be logically isolated from each other in the SAN by using zones and host groups.

Table 3 lists the path configurations used in this solution.

Table 3. Path Configuration

Initiator	*Host HBA Number*	*Switch*	*Zone Name*	*Storage System Port (Target)*
SAP Solution Manager	HBA 1 Port 1	Brocade 5300 -1	SAP_SOLMAN_HBA1_1_VSP_5A	VSP 5A
SAP Solution Manager	HBA 1 Port 2	Brocade 5300 -2	SAP_SOLMAN_HBA2_2_VSP_6A	VSP 6A
SAP ABAP Instance	HBA 2 Port 1	Brocade 5300 -1	SAP_ABAP_HBA1_1_VSP_3A	VSP 3A
SAP ABAP Instance	HBA 2 Port 2	Brocade 5300 -2	SAP_ABAP_HBA2_2_VSP_4A	VSP 4A

Figure 2 shows the storage network configuration of the SAP instances. This solution uses four connections from the SAP instances to the Virtual Storage Platform. This includes two HBA connections to each of the SAP instances.

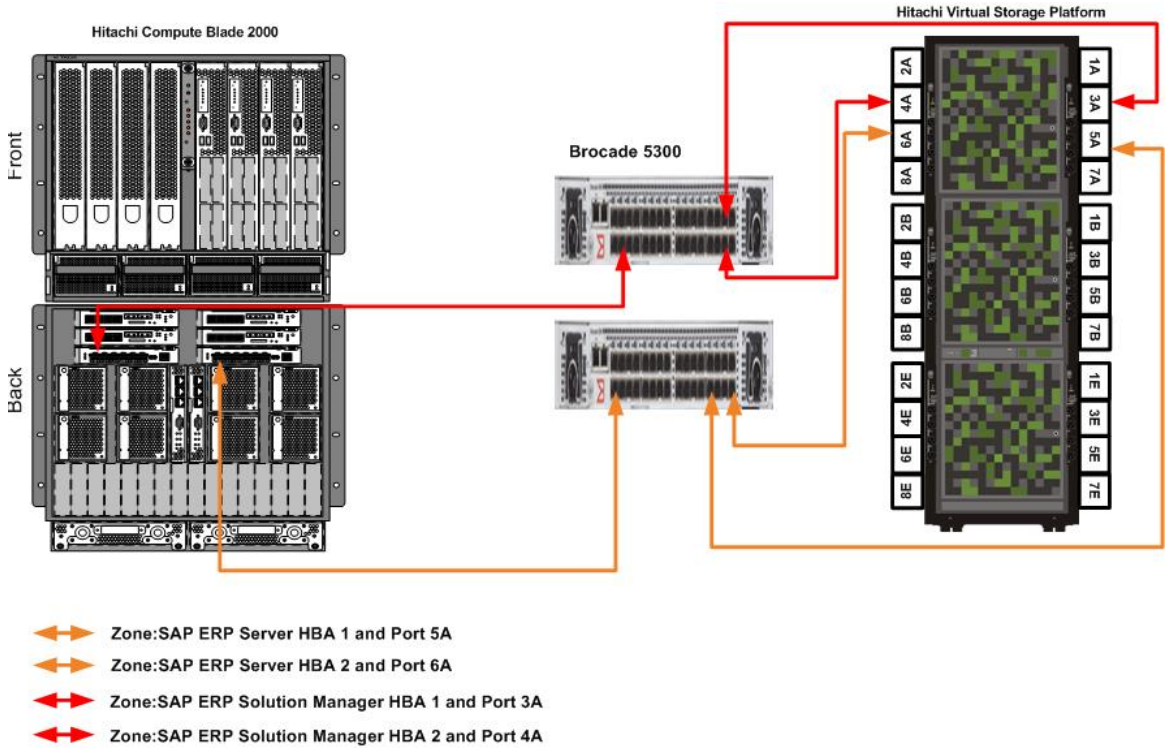

Figure 2

Configure Storage

Two dynamic provisioning pools were created for the SAP databases, one for each SAP server. All RAID groups used to create the dynamic provisioning pools were configured as RAID-5 (3D+1P). All drives were 300GB 10K RPM SAS drives. A total of two RAID groups were used for each of the dynamic provisioning pools, giving each pool a storage capacity of 1.6TB. Six dynamic provisioning virtual volumes (DP-VOLs) were configured for each dynamic provisioning pool.

Table 4 lists the configuration of the dynamic provisioning pools created for the SAP servers.

Table 4. Hitachi Dynamic Provisioning Pool Configuration

Dynamic Provisioning Pool	*Role*
SAP_SOL	SAP Solution Manager
SAP_ERP	SAP ERP server

Table 5 lists storage configuration details for LDEVs created for the SAP Solution Manager in the SAP_SOL pool. All LDEVs were mapped to storage ports 3A and 4A.

Table 5. LDEV Storage Configuration for the SAP Solution Manager Server

LDEV	Host LUN	Size (GB)
00:00:14	00	200
00:00:15	01	100
00:00:16	03	125
00:00:17	04	125
00:00:18	05	125
00:00:19	06	125

Table 6 lists storage configuration details for LDEVs created for the SAP ERP server in the SAP_ERP pool. All LDEVs were mapped to storage ports 5A and 6A.

Table 6. LDEV Storage Configuration for the SAP ERP Server

LDEV	Host LUN	Size (GB)
00:01:14	00	200
00:01:15	01	100
00:01:16	03	125
00:01:17	04	125
00:01:18	05	125
00:01:19	06	125

One RAID-10 (2D+2P) RAID group was used to store the SAP transaction logs.

All drives were 300GB 10K RPM SAS drives. The RAID group had a storage capacity of 600GB. Both the Microsoft SQL Server 2008 logs for SAP Solution Manager and SAP ERP systems are located within the RAID Group ID 1-1.

Table 7 lists the LUN configuration of RAID group 1-1 for the logs of SAP Solution Manager and SAP ABAP server.

Table 7. ERP and Solution Manager LDEV Configuration of RAID Group 1-1

LDEV	Host Group	Host LUN	Size (GB)	Server	Virtual Storage Platform Port
00:01:10	1	02	100	SAP Solution Manager	3A, 4A
00:01:11	2	02	100	SAP ERP	5A, 6A

Create LDEVs in a RAID Group

This procedure creates the LDEVs for the SAP logs. To create one or more LDEVs in a RAID group using Hitachi Command Suite, follow these steps:

1. Under **Resources** on the **Resources** tab, click the name of the Virtual Storage Platform system.

   An area for **Summary** and **Detailed Information** displays.

2. Under **Detailed Information**, click the **Parity Groups** link.

   The **Parity Groups** area replaces the **Detailed Information** area.

3. From the **Actions** list in the **Summary** area, click **Create Volumes**.

   The **Create Volumes** dialog box opens.

4. Enter the **No. of Volumes** you want to create.

5. Enter the **Volume Capacity**.

6. Click the **Advanced Options** link to display more options on the **Create Volumes** dialog box.

7. For **LDEV ID,** click **manual**

   Initial LDEV ID: is added to the **Create Volumes** dialog box.

8. In the **CU** list, click a value.

9. In the **DEV** list, click a value.

10. Click **Show Plan**.

11. Click **Create**.

Create Dynamic Provisioning Pools

To create Dynamic Provisioning pools on a Virtual Storage Platform using Hitachi Command Suite software, follow these steps:

1. Under **Resources** on the **Resources** tab, click the name of the Virtual Storage Platform system.

   An area for **Summary** and **Detailed Information** displays.

2. Under **Detailed Information**, click the **DP Pools** link.

   The **DP pools** area replaces the **Detailed Information** area.

3. From the **Actions** list in the **Summary** area, click **Create Pool**.

   The **Create Pool** dialog box opens.

4. Type a name in **Pool Name**.

5. From the **Selected Parity Groups** area, click **Select**.

   The **Select Parity Groups** dialog box opens.

6. Click a **Parity Group** from the table on the **Available Parity Groups** dialog box.
7. Click **Add.**

   The selected parity group is added to the table in the **Selected Parity Groups** area.
8. Click **OK**.
9. Click **Show Plan**.
10. Review the **Plan Summary** area and select **Create**.

Create Logical Devices (LDEVs) within a Dynamic Provisioning Pool

This procedure assumes that dynamic pool creation in your environment is complete.

To create one or more logical devices (LDEVs) within a dynamic provisioning pool using Hitachi Command Suite software, follow these steps:

1. Under **Resources** on the **Resources** tab, click the name of the Virtual Storage Platform system.

   An area for **Summary** and **Detailed Information** displays.
2. Under **Detailed Information**, click the **DP Pools** link.

   The **DP pools** area replaces the **Detailed Information** area.
3. From the **DP pools** pane, click the **Pool** link where you want to create the LDEV**.**

   The **Summary** area shows information about the pool. The **DP Vols** tab shows the volumes in that pool.
4. From the **Actions** list in the **Summary** area, click **Create Volumes**.

   The **Create Volumes** dialog box displays.
5. Enter the **No. of Volumes** you want to create.
6. Enter the **Volume Capacity**.
7. Click the **Advanced Options** link to display more options on the **Create Volumes** dialog box.
8. For **LDEV ID,** click **manual**

   Initial LDEV ID: is added to the **Create Volumes** dialog box.
9. In the **CU** list, click a value.
10. In the **DEV** list, click a value.
11. Click **Show Plan**.
12. Click **Create**.

Create Host Groups

To create host groups using Storage Navigator software, follow these steps:

1. Under **Resources** on the **Resources** tab, click the name of the Virtual Storage Platform system.

   An area for **Summary** and **Detailed Information** displays.

2. Click **Hosts** in the **Resources** area.

   The **Hosts** area displays.

3. Click **Add Hosts** at the bottom of the **Hosts** area.

   The **Add Hosts** dialog box displays.

4. Click **Windows** from the **OS Type:** list.

5. Click the **Add Hosts Manually** option.

   The **Add Hosts** dialog box changes to add the host manually.

6. Type the **Host Name:**

7. Do one of the following to add each WWN to the **Selected WWNs** list:

   - Type a value in **Enter WWN:** and press ENTER.
   - Find the WWN in the **Known WWNs** list and click **Add**.

   To remove a WWN from the **Selected WWNs** list, select the WWN and click **Remove**.

8. Click **OK**.

Map LDEVs from Parity Groups

To map LDEVS using Hitachi Command Suite software, follow these steps:

1. Under **Storage Systems** in the **Resources** area on the **Resources** tab, click the name of the Virtual Storage Platform system.

   An area for **Summary** and **Detailed Information** displays.

2. Under **Detailed Information**, click the **Open-Unallocated** link.

   The **Volumes** area replaces the **Detailed Information** area.

3. Select one or more records in the **Volume** column. Do not click the link for the volume to make your selection. Make your selection by clicking another place on that volume's record in the table. More than one volume may be selected by holding down SHIFT when clicking the record.

4. Click **Allocate Volumes** from the **Actions** list at the top of the **Summary** area. Do *not* click the **Allocate Volumes** button at the bottom of the **Volumes** area.

   The **Allocate Volumes** dialog box opens.

5. Click a **Host:** from the list.

6. Click the **No. of Volumes** you want to create from the list.
7. Enter the **Volume Capacity.**
8. Click **Show Plan**.
9. Review the details in the **Plan Summary** area
10. Do one of the following to allocate the volume or make changes.
    - Click **Allocate** to make the allocation.
    - Click **Back** to make changes.

Map Dynamic Pool Volumes

To map the volumes of Dynamic pools using the Hitachi Command Suite software, follow these steps:

1. Under **Resources** on the **Resources** tab, click the name of the Virtual Storage Platform system.

   An area for **Summary** and **Detailed Information** displays.
2. Under **Detailed Information**, click the **DP Pools** link.

   The **DP pools** area replaces the **Detailed Information** area.
3. From the **DP pools** pane, click the **Pool** link where you want to map the volume**.**

   The **Summary** area shows information about the pool. The **DP Vols** tab shows the volumes in that pool.
4. Select one or more records in the **Pool** column. Do not click the link for the pool to make your selection. Make your selection by clicking another place on that pool's record in the table. More than one pool may be selected by holding down SHIFT when clicking the record.
5. Click **Allocate Volumes** from the **Actions** list at the top of the **Summary** area. Do *not* click the **Allocate Volumes** button at the bottom of the **DP Pools** area.

   The **Allocate Volumes** dialog box displays.
6. Click a **Host:** from the list.
7. Click the **No. of Volumes** you want to create.
8. Enter the **Volume Capacity.**
9. Click **Show Plan**.
10. Review the details in the **Plan Summary** area
11. Do one of the following to allocate the volume or make changes.
    - Click **Allocate** to make the allocation.
    - Click **Back** to make changes.

Configure Management Servers

Two SAP client servers and one management server for access to Hitachi Storage Navigator were installed and used as management servers. The SAP GUI software allows access to a SAP system from client machines. It also lets SAP system administrators manage ABAP-based systems. SAP GUI software is installed on SAP clients.

For this tested deployment, the client machines were Microsoft Windows-based servers. For more information about the installation of the SAP GUI 7.20, see the SAP Front End Installation Guide 7.20.

Configure Hitachi Compute Blade 2000

This describes how to configure the Hitachi Compute Blade 2000. These procedures assume the following:

- The blade chassis is racked.
- The blades are installed into the chassis.
- All LAN and SAN cabling are complete.

For this solution, Hitachi Data Systems used a Hitachi Compute Blade 2000 connected to a Hitachi Virtual Storage Platform. The Hitachi Compute Blade 2000 was configured with no internal disks, so all operating systems were booted from the SAN.

Configure Required Management IP Addresses

Follow these steps to configure the IP addresses for the management module and the blades using the management module web GUI:

1. Connect a laptop or personal computer to the MGMT0 port of the management module with an Ethernet cable. See Figure 3. If two management modules are installed, connect it to the management module with the MSR LED that is lit solid green.

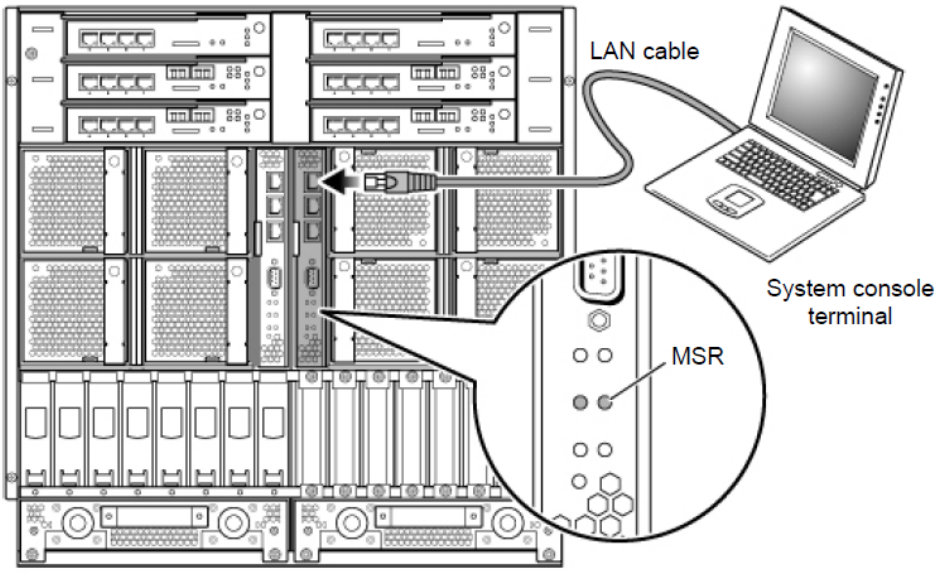

Figure 3

2. Open a browser and type this in the address bar: `http://192.168.0.1/`

   A log on screen displays.

3. Log on using the default user name and password:

   - User name: `administrator`
   - Password: `password`.

   The management module web GUI launches.

4. Click the **Settings** tab.

5. In the navigation area on the left, click **The configuration of network link**.

   The **Management LAN Network** area displays.

6. Click **Edit** in the **Management LAN network** area.

   The fields become editable.

7. Enter an IP address, subnet mask, and default gateway for all of the following:

   - The management module
   - Each active partition (blade)

   You need one IP address for the management module and one IP address for each partition (blade).

8. Click **Confirm**, and then click **Apply**.

   The IP settings are saved.

9. Disconnect the Ethernet cable from the management module.

10. Connect an Ethernet cable from the management module to an external management LAN switch. Then you can perform management through any system console in the management LAN.

Configure Blades

Complete the following procedures for each active blade (partition). Complete both configuration methods for each blade.

Configure Hitachi Compute Blade 2000 to Boot from SAN

To configure the Hitachi Compute Blade 2000 to boot from the SAN, follow these steps:

1. Open a browser and type the blade IP address in the address bar.

2. Log on to the blade web GUI using the default user name and password:

   - User name: `user01`
   - Password: `pass01`

   The blade web GUI launches.

3. Click **Launch Remote Console**.

   The Remote Console will open in a new Window.

4. From the top menu, click **Power and Reset**, and then click **Power On**.

   A warning message confirms the server will be powered on.

5. Click **Yes**.

6. When prompted to enter the BIOS during the system boot, press Ctrl + R.

   This message appears on the screen: `<Ctrl-R> Detected. Please Wait…`

7. From the **<< Select Operation >>** screen, use the appropriate arrow key to move up or down to highlight **SELECT HBA**, and press ENTER.

   The **<< SELECT HBA >>** screen displays with a list of available HBAs.

8. From the **<<SELECT HBA >>** screen, use the appropriate arrow key to move up or down to highlight the first HBA to configure for SAN boot.

   The **<< MAIN MENU >>** screen of the selected HBA shows on the same screen.

9. Press ENTER to select the first option, **1. SET HBA BIOS ENABLE/DISABLE**.

   The **<<SET HBA BIOS>>** screen appears.

10. Press ENTER to change the **HBA BIOS:** from **DISABLE** to **ENABLE**.

    The **HBA BIOS:** is now set to **ENABLE.**

11. Press ESC on your keyboard.

    The **<<MAIN MENU>>** screen appears.

12. Press DOWN ARROW to select the option **2. SET BOOT PRIORITY.**

    The **<< SET BOOT PRIORITY >>** screen appears in the same screen.

13. Press ENTER to change the **BOOT PRIORITY:** from **DISABLE** to **ENABLE.**

    The **BOOT PRIORITY:** is now set to **ENABLE.**

14. Press DOWN ARROW to select **1. Boot priority option**.

    The highest boot priority is highlighted.

15. Press ENTER to discover the provisioned LUN from storage.

    The **<< SELECT BOOT DEVICE >>** screen appears on the same screen. Confirm that the WWN of the storage port of the Virtual Storage Platform where you have configured the boot LUN is discovered by the blade BIOS.

    If no WWN exists, check the connection and configuration of the storage area network.

16. Press ESC to return to the **<< SET BOOT PRIORITY >>** screen.

    The **<< SET BOOT PRIORITY >>** screen appears in the same screen.

17. Press ESC to return to the **<< MAIN MENU >>** screen.

    The **<<MAIN MENU>>** screen appears in the same screen.

18. Press ESC to exit the BIOS configuration.

19. Select **YES: SAVE SETTING** on the **<< SETUP CONFIRMATION >>** screen.

20. Press ENTER on your keyboard to save the HBA BIOS settings.

    Boot from SAN is now configured.

21. From the top menu, click **Power and Reset**, and then click **Power Off**.

    Leave the remote console session open for "Configure Hitachi Compute Blade 2000 to Boot from Windows Server 2008 Installation ISO image."

Configure Hitachi Compute Blade 2000 to Boot from Windows Server 2008 Installation ISO image

The following assumes that the remote console session from "Configure Hitachi Compute Blade 2000 to Boot from SAN" is still open.

To mount the Microsoft Windows 2008 Enterprise Edition ISO image from a remote DVD, follow these steps:

1. From the top menu bar, click **Remote CD/DVD**, and then click **Redirect CD/DVD Image**.

   The **Open** dialog box displays.

2. Navigate to the ISO image and click **Open**.

   The **Open** dialog box closes, returning you to the **Remote Console** screen.

3. From the top menu bar, select **Power and Reset**, and then click **Power On**.

   The Microsoft Windows 2008 server installation DVD now starts.

Deploy the Windows Server 2008 Operating System

After the blade boots from the ISO image, follow Microsoft's instructions to complete the installation, specifying the Hitachi HBA driver, Microsoft Windows Server 2008 Enterprise Edition (full installation) and a strong password for the local Administrator account. You must install Windows 2008 and ensure that all Windows updates are applied, including service pack 2.

For more information, see the Microsoft *TechNet* article "Install from the product discs."

Table 8 lists the file system layout details about the **SAP Solution Manager** and **SAP ABAP**. Both servers have the same layout.

Table 8. File System Layout for SAP Solution Manager Server and SAP ABAP Server

Host LUN	*File System Mount Point*	*Usage*
0000	`C:\`	Host Operating System and Microsoft SQL server 2008 installation files
0001	`S:\usr\sap`	File system for SAP binaries, SAP trans.
0002	`L:\<SID>LOG1`	SAP Transaction Log 1
0003	`L:\<SID>LOG2`	SAP Transaction Log 2
0004	`L:\<SID>LOG3`	SAP Transaction Log 3
0005	`M:\<SID>DATA1`	SAP Data 1
0006	`M:\<SID>DATA2`	SAP Data 2

In the tested solution, dynamic disks were used for the drive M mount points on the **SAP Solution Manager** and **SAP ERP**.

Deploy the Microsoft SQL Server 2008 for SAP

Microsoft SQL Server 2008 software must be installed prior to the installation of any SAP instance. For more information about the advanced configuration of the Microsoft SQL Server 2008 for SAP environments see the SAP Developer Network guide "SAP with Microsoft SQL Server 2008 and SQL Server 2005: Best Practices for High Availability, Maximum Performance, and Scalability."

For detailed instructions for installation of Microsoft SQL server 2008, see the *SAP Installation Guide* for SAP ERP 6.0 Enhancement Pack 4 Ready SR1.

For information about the most recent update for Microsoft SQL server 2008 that is supported by SAP, see the SAP note 62988 .

Deploy SAP Solution Manager Software

Install the **SAP Solution Manager** on a dedicated Hitachi Compute Blade 2000.

The following steps are an overview of the installation of the **SAP Solution Manager**. For more information, see the *SAP Solution Manager* page for release 7.0 EHP 1, which is available to licensed SAP customers:

- **Master Guide**—Installation sequence information
- **Installation**—Step-by-step installation guide

To install the **SAP Solution Manager**, follow these steps:

1. Copy the **SAP Solution Manager** from the installation media to the desktop or local drive on the Windows 2008 Operating System.
2. Run **sapinst.exe** from the Master Installation media.

   The **SAP Installation Master** displays.

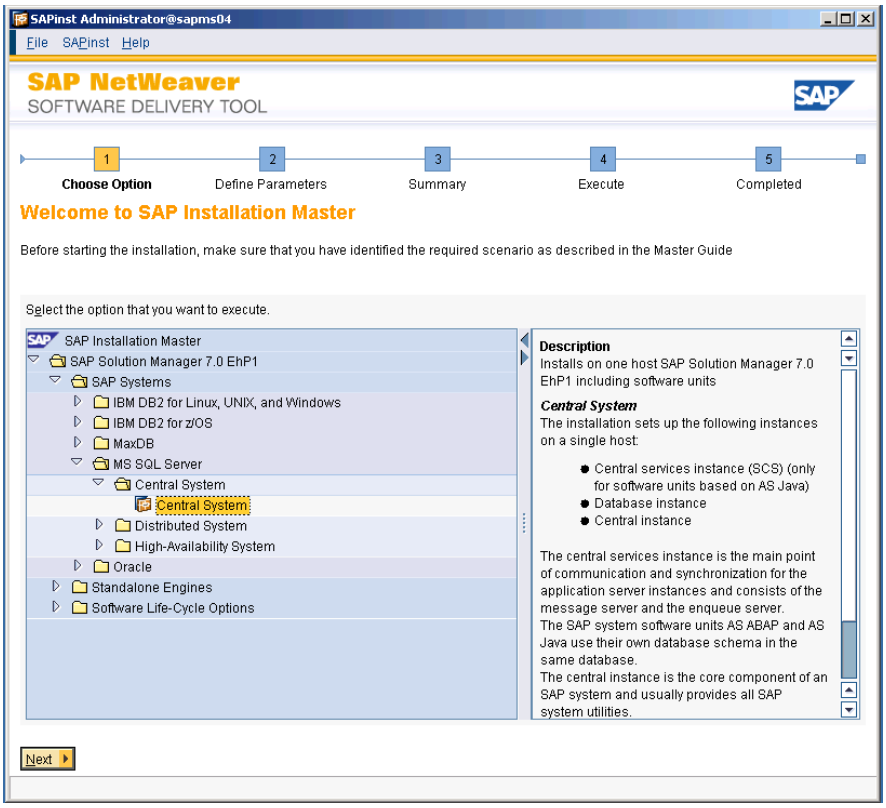

Figure 4

3. Select the **Central System** instance by navigating the tree through the following, as shown in Figure 4:

   - SAP Solution Manager 7.0 EhP1 folder
   - SAP Systems folder
   - MS SQL Server folder
   - Central System folder
   - Central System instance

4. Type any values for the following on the **Central and SCS Instance** page (Figure 5):

   - ABAP Message Server Port
   - Internal ABAP Message Server Port
   - Internal SCS Message Server Port

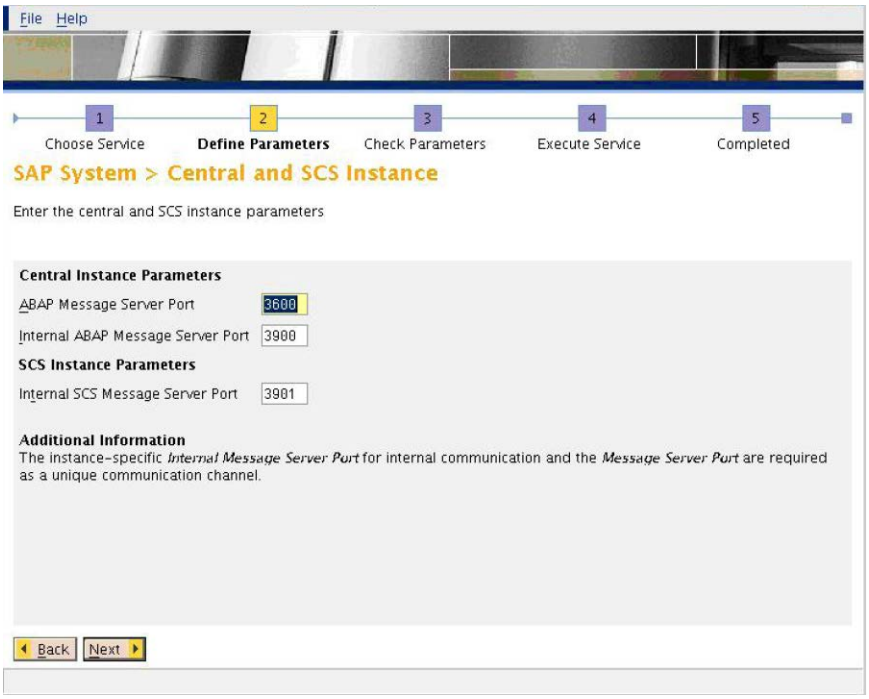

Figure 5

The **SAP Installation Master** verifies the parameters that you provide and begins to execute the installation. If any parameters cannot be validated, the values can be changed.

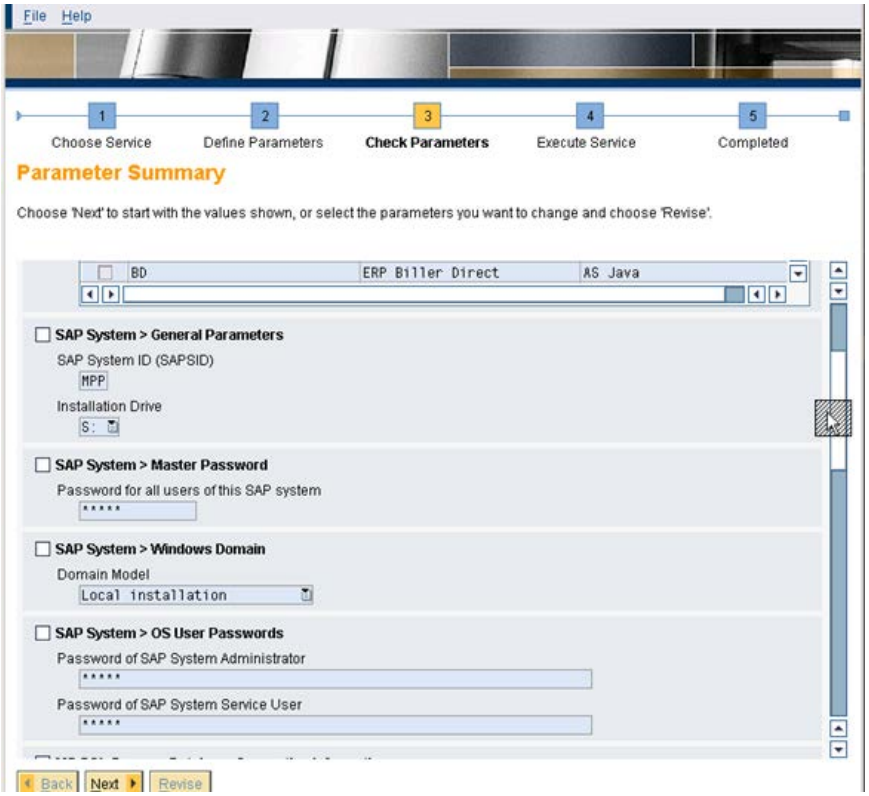

Figure 6

5. Review the **Parameter Summary** page (Figure 6). Enter information required by the SAP Installation Master.

   After all the steps are complete, **SAP Installation Master** displays a message indicating a successful installation.

Deploy SAP ERP Software

Install SAP ERP on a dedicated server for a central instance. These steps are intended to give you an overview of the installation of the SAP ABAP instance, for more information, see the SAP ERP—Installation and upgrade Information page for SAP ERP 6.0 which is available to licensed SAP customers:

- **First Steps**—Steps to start the installation of SAP ERP 6.0
- **Master Guide**—Installation sequence information
- **Installation**—Step-by-step installation guide

To install the SAP ERP software, follow these steps:

1. Copy SAP ERP 6.0 Enhancement Pack 4 from the installation media to the desktop or local drive on the Microsoft Windows Server 2008 operating system.
2. Run **sapinst.exe** from the **Master Installation** media.

   The **SAP Installation Master** displays.

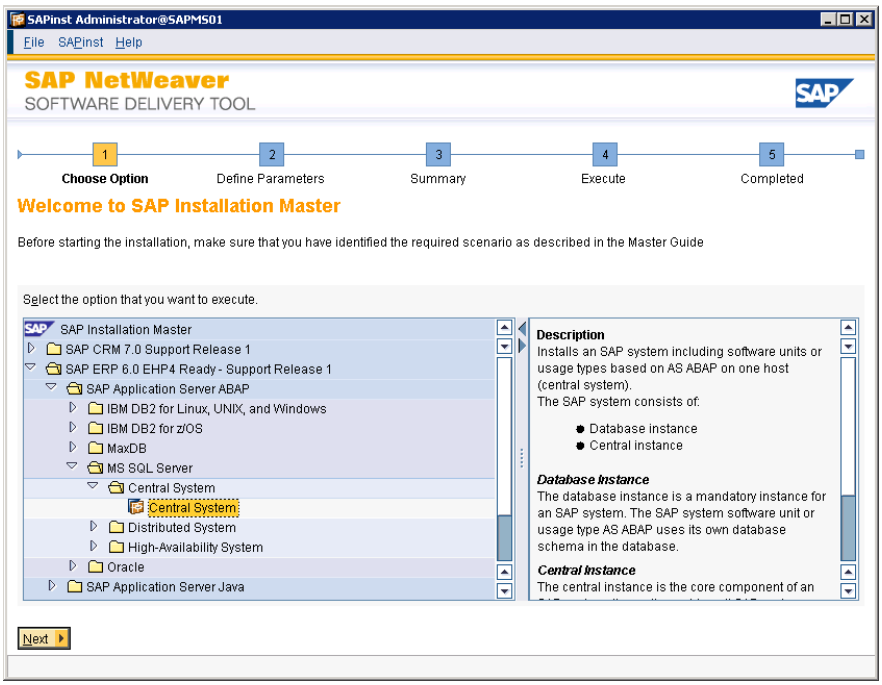

Figure 7

3. Select the **Central System** instance by navigating the tree through the following, as shown in Figure 7:

   - SAP ERP 6.0 ENHP4 Ready Support Release 1 folder
   - SAP Application Server ABAP folder
   - MS SQL Server folder
   - Central System folder
   - Central System instance

4. Provide these values for the following on the **Software Package Check** page (Figure 8):

   - Enter **Package Location**. Click **Browse** to locate the package.
   - Select **Check Location**.
   - Enter **Copy Package To**. Click **Browse** to locate the package.

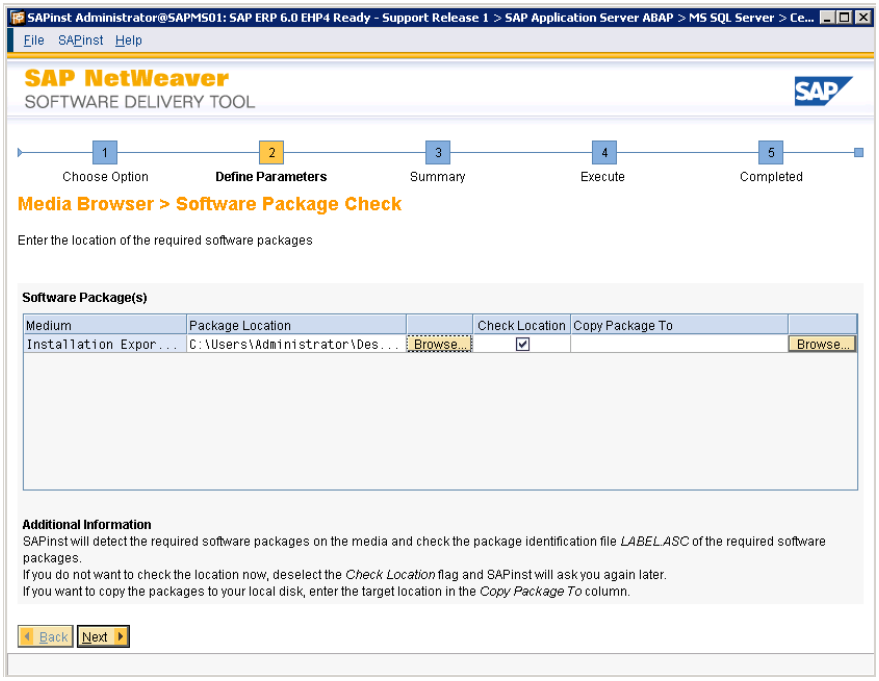

Figure 8

The **SAP Installation Master** verifies the parameters that you provide and begins to execute the installation. If any parameters cannot be validated, the values can be changed.

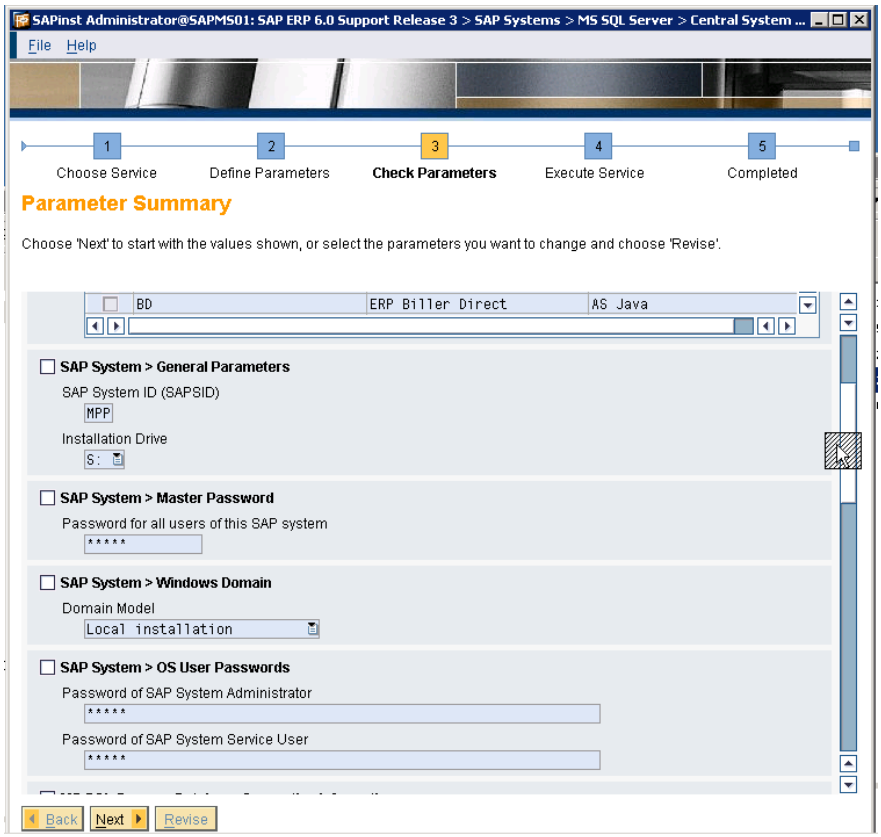

Figure 9

5. Review the **Parameter Summary** page (Figure 9). Enter information required by the **SAP Installation Master**.

   After all the steps are complete, the **SAP Installation Master** displays a message indicating a successful installation.

Upgrade SAP Kernel and Support Package Stacks

This solution requires the upgrade of SAP Kernel for the ABAP instance. In order to complete this installation you must apply the latest SAP kernel and support package stacks. For more information about upgrading a SAP ERP 6.0 kernel and support package stacks, see the following SAP documents, available to licensed SAP Customers.

- SAP Note 19466, Downloading SAP Kernel patches
- SAP Note1165437. Enhancement package 4 for SAP ERP: Required support packages.

Hitachi Data Systems Corporation

Hitachi is a registered trademark of Hitachi, Ltd., in the United States and other countries. Hitachi Data Systems is a registered trademark and service mark of Hitachi, Ltd., in the United States and other countries. All other trademarks, service marks and company names mentioned in this document are properties of their respective owners.

Notice: This document is for informational purposes only, and does not set forth any warranty, expressed or implied, concerning any equipment or service offered or to be offered by Hitachi Data Systems Corporation

© Hitachi Data Systems Corporation 2011. All Rights Reserved. AS-091-00 June 2011

Corporate Headquarters
750 Central Expressway,
Santa Clara, California 95050-2627 USA
www.hds.com

Regional Contact Information
Americas: +1 408 970 1000 or info@hds.com
Europe, Middle East and Africa: +44 (0) 1753 618000 or info.emea@hds.com
Asia Pacific: +852 3189 7900 or hds.marketing.apac@hds.com