

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

Implementation Guide

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Feedback

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Implementation Guide

The information created and held within an SAP system is most often very sensitive and vital to any company. SAP systems, when properly maintained, offer businesses a central repository of all business processes configured in a SAP system. Very often SAP applications must be available 24 hours a day, seven days a week, meaning a loss of application availability can have a devastating effect on businesses.

SAP's Enterprise Resource Planning (ERP) software integrates business processes and information technologies. Generally, SAP ERP implementations are enterprise-wide and integrate a variety of SAP business modules.

The mission-critical nature of SAP deployments requires an IT infrastructure that delivers high performance and availability. The infrastructure must be easy to deploy, manage and scale. The storage area network (SAN) typically is responsible for two out of every three customer calls related to SAP database performance issues. It is crucial that the SAN, which houses database files, not only is capable of handling current loads, but is also capable of scaling to meet future transaction loads.

Good planning prior to deploying SAP software is vital to preventing performance issues, whether you're deploying business process management software for the first time or replacing a storage system that doesn't meet your needs.

All SAP solutions include an embedded database that runs on the selected operating systems. Microsoft Windows and SQL Servers provide secure, reliable and scalable SAP environments.

This white paper introduces the basic file system structure that underpins SAP implementations and explains how to use a Hitachi Virtual Storage Platform and Hitachi Compute Blade 2000 to maximize the value of SAP ERP 6.0 SR 3 deployments using Microsoft SQL Server 2005 and Microsoft Windows Server 2003.

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 easily locate related materials needed to construct a functional solution.

This white paper is written for businesses of all sizes that are deploying SAP on the Hitachi Virtual Storage Platform and Hitachi Compute Blade 2000. It is targeted at individuals at those businesses who are charged with deploying SAP on Hitachi Virtual Storage Platform and Hitachi Compute Blade 2000, with Microsoft Windows Server 2003 and SQL server 2005.

Storage administrators might not realize how important it is 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 just beginning SAP deployments as well as those who might be attempting to remedy problems in existing deployments.

This white paper assumes familiarity with SAN technologies and tools, as well as basic knowledge of Hitachi storage management software, including Hitachi Storage Navigator 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 an SAP ABAP instance. This solution is a basic SAP environment including 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.

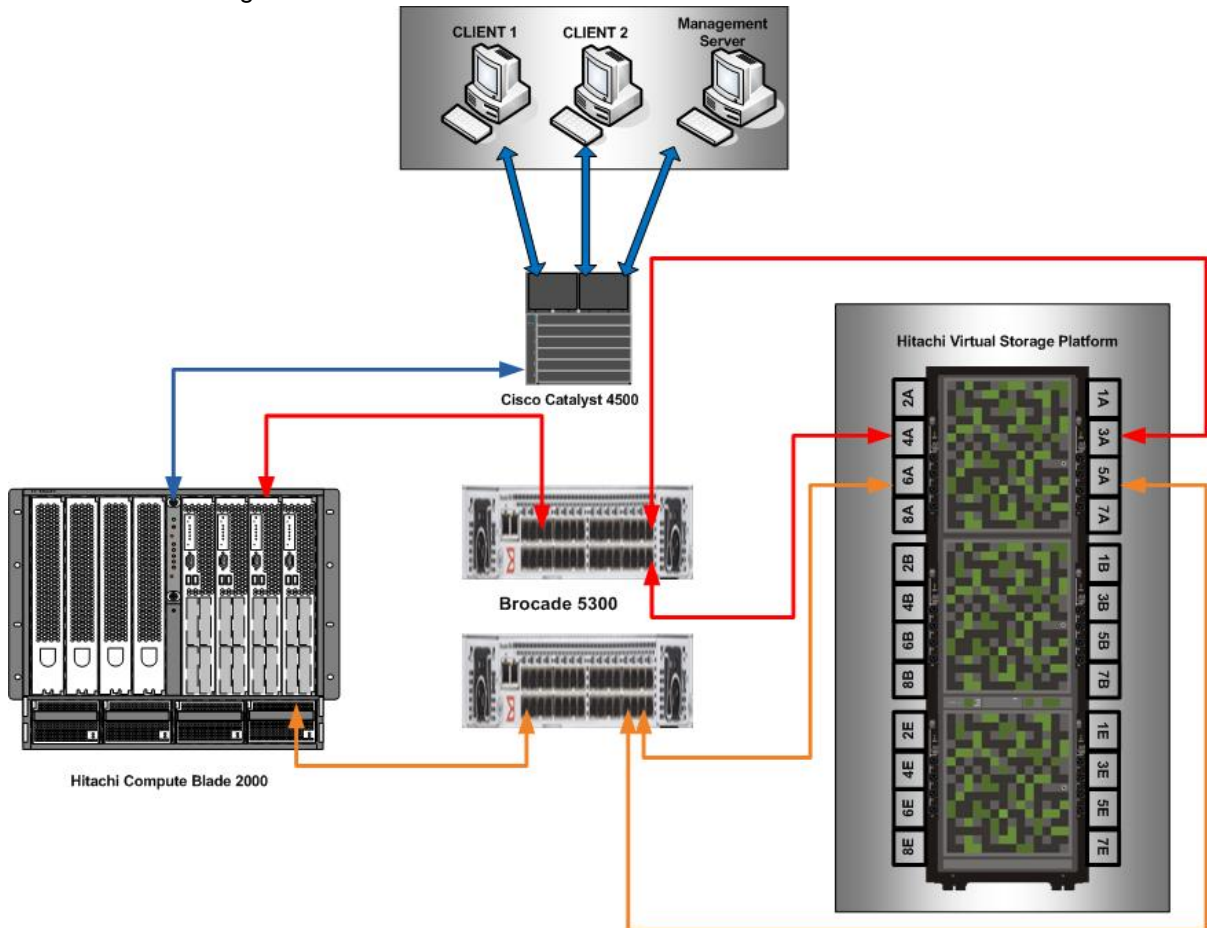


Figure 1

SAP offers numerous architectural designs to maximize performance, and 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 – Helps you get started with the installation of the SAP ERP 6.0 instance.
- Master Guide – 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

<i>Hardware</i>	<i>Quantity</i>	<i>Configuration</i>	<i>Role</i>
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 x 300GB 10K RPM SAS drives 64GB cache 14GB shared memory	SAP storage system
Hitachi Compute Blade 2000 chassis	1	8-blade chassis 8 Fiber Channel switch modules 8 x 1GB/sec network ports 2 x management modules 8 x cooling fan modules 4 x power supply modules	
Hitachi Compute Blade 2000 server blade	1	2 x 8 Core processor with 10GB of memory	SAP Solution Manager instance
Hitachi Compute Blade 2000 server blade	1	2 x 8 Core processor with 10GB of memory	SAP ABAP Instance
Brocade 5300 SAN Fibre Channel switch	2	FOS 5.3.1a 14 4Gb/sec 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 the industry's only 3D scaling storage platform. With the unique ability to concurrently scale up, scale out and scale deep in a single storage system, the new Virtual Storage Platform flexibly adapts for performance, capacity, connectivity and virtualization. No other enterprise storage platform can dynamically scale in three dimensions. The Virtual Storage Platform provides virtual storage that meets the growing demands of server virtualization.

The trend in server virtualization is to consolidate the I/O workload of many servers onto a single storage system. As more virtual machines are consolidated onto a physical host, storage systems must be able to dynamically add more storage resources to keep up with I/O demand. The 3D scaling capability of the Virtual Storage Platform meets that requirement.

Scaling up allows you to increase virtual server consolidation, improve utilization of resources, and reduce costs. With the Hitachi Virtual Storage Platform, you can increase performance, capacity and connectivity by adding cache, processors, connections and disks to the base system. A virtual server that accesses the storage system can use all these resources, which act as one system managed as a common pool of resources.

Scaling out allows you to meet increasing demands by combining multiple chassis into a single logical system with shared resources. By scaling out, you can support increased resource needs in virtualized server environments.

Scaling deep extends the advanced functions of the Virtual Storage Platform to external multivendor storage. By dynamically virtualizing new and existing storage systems, those systems become part of the Virtual Storage Platform's pool of storage resources. Once virtualized, external data can then be migrated, tiered, replicated and managed by the Virtual Storage Platform. In this manner, older data storage systems can gain a longer useful life. You can extend distance replication for business continuity to lower-cost, lower-function storage systems by virtualizing them behind a Virtual Storage Platform.

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 features a modular architecture that delivers unprecedented configuration flexibility.

The Hitachi Compute Blade 2000 combines all the benefits of virtualization with all the advantages of the blade server format: simplicity, flexibility, high compute density and power efficiency.

The Hitachi Compute Blade 2000 enables you to use virtualization to consolidate application and database servers for backbone systems, areas where effective consolidation was difficult in the past. And by removing performance and I/O bottlenecks, Hitachi Compute Blade 2000 opens new opportunities for increasing efficiency and utilization rates and reduces the administrative burden in your data center.

No blade system is more manageable or flexible than the Hitachi Compute Blade 2000. You can configure and administer the Hitachi Compute Blade 2000 using a web-based HTML browser that supports secure encrypted communications, or leverage the optional management suite to manage multiple chassis using a unified GUI-based interface.

SAP Servers

Servers hosting SAP Solution Manager and Solution ERP servers must meet specification requirements for the SAP roles 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 from SAP's web site:

- SAP Note 26147, SAP GUI Resources: Hardware and Software
- SAP Note 901070, Resource Requirements for SAPECC6
- <http://service.sap.com/sizing>

Software Components

Table 2 lists the software used to test this solution in the Hitachi Data Systems lab.

Table 2. Tested Deployment Software

<i>Software</i>	<i>Version</i>
Hitachi Dynamic Provisioning	Microcode dependent
Hitachi Storage Navigator	Microcode dependent
Hitachi Dynamic Link Manager	6.0.1.0.804
SAP ERP (ABAP instance)	ECC 6.0 sr3 Upgraded to 7.01 Enhancement Package 4
SAP Solution Manager	7.0 Enhancement Package 1 on SP 25
SAP GUI	7.2
Microsoft SQL Server 2005	SP 2

The following sections describe the key software components used in this solution.

Hitachi Dynamic Provisioning Software

On the Hitachi Virtual Storage Platform, Hitachi Dynamic Provisioning software provides wide striping and thin provisioning functionalities. Hitachi Dynamic Provisioning software provides for one or more pools of storage across many RAID groups within a Virtual Storage Platform. One or more Dynamic Provisioning virtual volumes (DP-VOLs) of a user-specified logical size of up to 60TB (with no initial physical space allocated) are created against each pool. Hitachi Dynamic Provisioning software 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 Storage Navigator Software

Hitachi Storage Navigator software is the integrated interface for the Hitachi Virtual Storage Platform family firmware and software features. Use it to take advantage of all of the Virtual Storage Platform's features. Storage Navigator software provides a Web-accessible graphical management interface.

Storage Navigator software is used to map security levels for SAN ports and virtual ports and for inter-system path mapping. It is used for logical unit (LU) creation and expansion, and for online volume migrations. It also configures and manages Hitachi Replication products. It enables online microcode updates and other system maintenance functions and contains tools for SNMP integration with enterprise management systems.

Hitachi Dynamic Link Manager Advanced Software

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

For this solution Hitachi Dynamic Link Manager was installed on both the SAP Solution Manager instance and SAP ABAP instance. For more information, see the Hitachi Dynamic Link Manager Software 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 2005 Enterprise Edition with Service Pack 2.

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 2003 Operating Systems
6. Deploy the Microsoft SQL Server 2005 for SAP
7. Deploy SAP Solution Manager software
8. Deploy SAP ABAP Software
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 SAN

In the tested deployment, each server blade has a two port Fiber Channel mezzanine card installed and connected internally to the internal Fiber Channel switch modules located in the Hitachi Compute Blade 2000 chassis. Two inter-switch links were then connected to the Brocade 5300 switches which in turn, were connected to four ports of the Hitachi Virtual Storage Platform storage system. Each connection was configured with zones on the fabric switches according to the manufacturer's guidelines; in addition, follow these best 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 an 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 via the use of zones and host groups.

Table 3 lists the path configurations used in this solution.

Table 3. Path Configuration

<i>Initiator</i>	<i>Host HBA Number</i>	<i>Switch</i>	<i>Zone Name</i>	<i>Storage System Port (Target)</i>
SAP Solution Manager	HBA 1 Port 1	Brocade 5300 -1	SAP_SOLMAN_HBA1_1_V SP_5A	VSP 5A
SAP Solution Manager	HBA 1 Port 2	Brocade 5300 -2	SAP_SOLMAN_HBA2_2_V SP_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 Hitachi Virtual Storage Platform. This includes two HBA connections to each of the SAP instances.

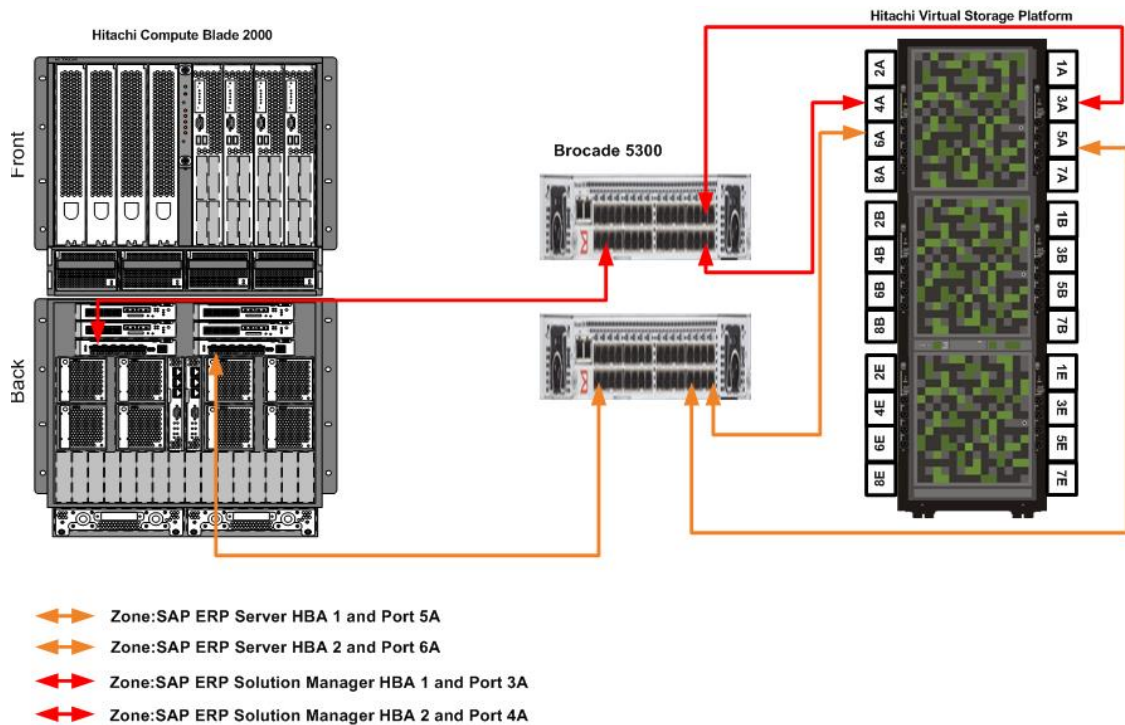


Figure 2

Configure Storage

Two Hitachi 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 DP-VOLs were configured per Dynamic Provisioning pool.

Table 4 lists the configuration of the Hitachi Dynamic Provisioning pools created for the SAP servers.

Table 4. Hitachi Dynamic Provisioning Pool Configuration

<i>Dynamic Provisioning Pool</i>	<i>Role</i>
SAP_SOL	SAP Solution Manager server
SAP_ERP	SAP ERP server

Table 5 lists storage configuration details for LDEVs created for the SAP Solution Manager server 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

<i>LDEV</i>	<i>Host LUN</i>	<i>Size (GB)</i>
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

<i>LDEV</i>	<i>Host LUN</i>	<i>Size (GB)</i>
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-5 (3D+1P) 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 900GB. Both the Microsoft SQL server 2003 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 server and SAP ABAP server.

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

<i>LDEV</i>	<i>Host Group</i>	<i>Host LUN</i>	<i>Size (GB)</i>	<i>Server</i>	<i>Virtual Storage Platform Port</i>
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 is used to create the LDEVs used by the various SAP logs. To create one or more LDEVs in a RAID group using Hitachi Storage Navigator software, follow these steps:

1. Choose **Actions > Create LDEVs**

The **Create LDEVs** window displays.

2. From the **Provisioning Type** drop-down menu, select **Basic**.
3. From the **Emulation Type** drop down menu, select **OPEN-V**.
4. (Optional) Choose a menu item from the **Drive Type/RPM** drop-down menu and from the **RAID Level** drop-down menu.

These options allow you to filter the available RAID group volumes.

5. Choose the **Select Free Spaces**

The Available Free Spaces window displays

6. Highlight the **Parity Group** in the **Available Free Space** window and choose **OK**
7. Enter a capacity amount in the **LDEV Capacity** field and choose a unit of measure from the drop-down menu.
8. Enter the number of LDEVs of that size to be created in the **Number of LDEVs** field.
9. In the **LDEV Name** pane, assign a prefix in the **Prefix** field and assign an initial number in the **Initial Number** field.
10. Expand the **Options** pane.
11. Review the value in the **LDKC** field.

Modify the LDKC value if the default of **00** is not appropriate. This is most often the case if the storage will be configured with more than one LDKC.

12. Choose a value from the **CU** drop-down menu.
13. Choose a value from the **DEV** drop-down menu.
14. (Optional) Choose a value from **Interval** drop-down menu.

Leave this value at the default of **0** for sequential numbering of LDEVs. If you want a different numbering sequence, choose a different value.

15. Review the default values in the **Initial SSID** field, the **CLPR** field and **Processor Blade** field.

In most situations, use the default values. Change them only if your environment requires different values.

16. Click the **Add** button.

The **Selected LDEVs** pane is populated.

17. Click the **Finish** button.

The **confirm** window for creating LDEVs displays.

18. Click the **Apply** button.

Create Dynamic Provisioning Pools

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

1. Choose **Actions > Pool > Create Pools**.

The **Create Pools** window displays.

2. From the **Pool Type** drop-down menu, choose **Dynamic Provisioning**.

3. Click the **Select Pool VOLs** button.

The **Select Pool VOLs** window displays.

4. Highlight one or more pool volumes in the **Available Pool Volumes** pane and click **OK**.

The **Create Pools** window displays with the **Total Selected Pool Volume** and **Total Selected Capacity** fields populated.

5. Assign a prefix for the pool name in the **Prefix** field.
6. (Optional) Assign an initial number for the pool name in the **Initial Number** field.
7. Expand the **Options** pane.
8. Assign a pool ID in the **Pool ID** field.
9. Assign a subscription limit in the **Subscription Limit** field.

This is the percentage of oversubscription for this pool that you allow in your environment.

10. Choose a value from the **User-Defined Threshold** drop-down menu and click the **Add** button.

The **User Defined Threshold** value determines when a pool capacity alert is triggered.

The **Selected Pools** pane is populated.

11. Click the **Finish** button.

The **Create Pools** window displays.

12. Click the **Apply** button.

Create LDEVs within a Dynamic Provisioning Pool

This procedure assumes that Dynamic Pool creation in your environment is complete. To create one or more LDEVs within a Dynamic Provisioning pool using Hitachi Storage Navigator software, follow these steps:

1. Choose **Actions > Logical Device > Create LDEVs**.

The **Create LDEVs** window displays.

2. From the **Provisioning Type** drop-down menu, select **Dynamic Provisioning**.
3. From the **Emulation Type** drop down menu, select **OPEN-V**.
4. (Optional) Choose a menu item from the **Drive Type/RPM** drop-down menu and from the **RAID Level** drop-down menu.

These options allow you to filter the available pool volumes.

5. Click the **Select Pool** button.

The **Select Pool** window displays.

6. Highlight a pool in the **Available Pools** pane and click **OK**.

The **Create LDEVs** window displays with the **Selected Pool Name** and the **Selected Pool Capacity** fields populated.

7. Enter a capacity amount in the **LDEV Capacity** field and choose a unit of measure from the drop-down menu.
8. Enter the number of LDEVs of that size to be created in the **Number of LDEVs** field.
9. In the **LDEV Name** pane, assign a prefix in the **Prefix** field and assign an initial number in the **Initial Number** field.
10. Expand the **Options** pane.
11. Review the value in the **LDKC** field.

Modify the LDKC value if the default of **00** is not appropriate. This is most often the case if the storage will be configured with more than one LDKC.

12. Choose a value from the **CU** drop-down menu.

13. Choose a value from the **DEV** drop-down menu.

14. (Optional) Choose a value from **Interval** drop-down menu.

Leave this value at the default of **0** for sequential numbering of LDEVs. If you want a different numbering sequence, choose a different value.

15. Review the default values in the **Initial SSID** field, the **CLPR** field and **Processor Blade** field.

In most situations, use the default values. Change them only if your environment requires different values.

16. Click the **Add** button.

The **Selected LDEVs** pane is populated.

17. Click the **Finish** button.

The **Create LDEVs** window displays.

18. Click the **Apply** button.

Create Host Groups

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

1. Choose **Actions > Ports/Host Groups > Create Host Groups**.

The **Create Host Groups** window displays.

2. Assign a name in the **Host Group Name** field.

3. From the **Host Mode** drop-down menu, choose **00[Standard]**.

4. In the **Available Hosts** pane, highlight one or more hosts.

5. In the **Available Ports** pane, highlight one or more ports.

6. Click the **Add** button.

The **Selected Host Groups** pane is populated.

7. Click the **Finish** button.

The **Create Host Groups** window displays.

8. Click the **Apply** button.

Map LDEVs

To map LDEVs using Hitachi Storage Navigator software, follow these steps:

1. Choose **Actions > Logical Device > Add LUN Paths**.

The **Add LUN Paths** window displays.

2. In the **Available LDEVs** pane, highlight one or more LDEVs.

3. Click the **Add** button.
The **Selected LDEVs** pane is populated.
4. Click **Next**.
The **Add LUN Paths** window displays.
5. In the **Available Host Groups** pane, highlight one or more host groups.
6. Click the **Add** button.
The **Selected Host Groups** pane is populated.
7. Click **Next**.
The **Add LUN Paths** window displays.
8. Click **Finish**.
The **Add LUN Paths** window displays.
9. Click the **Apply** button.

Configure Management Servers

Two SAP client servers and one management server for access to Hitachi Storage Navigator are installed and used as management servers. The SAP GUI software allows users and administrators to access SAP system from client machines. It also lets SAP system administrators manage ABAP based systems. SAP GUI software is installed on SAP clients. For the tested deployment used in this solution, 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

The following sections describe how to configure the Hitachi Compute Blade 2000. These procedures assume that the chassis is racked, the blades are installed into the chassis, and that all cabling (LAN and SAN) is complete.

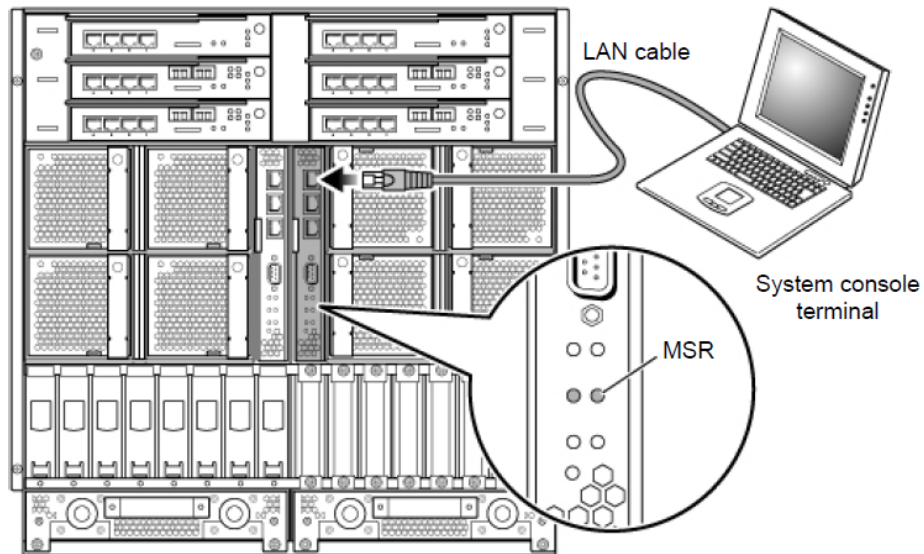
For this solution, Hitachi Data Systems used a Hitachi Compute Blade 2000 connected to a Hitachi Virtual Storage Platform. The Hitachi Compute Blade 2000 was configured with no internal disks so the operating system was booted from the SAN.

Configure Required Management IP Addresses

To configure the IP addresses for the management module and the blades using the management module web GUI, follow these steps:

1. Connect a system console (laptop or PC) to the MGMT0 port of the management module with an Ethernet cable.

If two management modules are installed, connect to the management module with the MSR LED that is lit solid green.



2. Open a browser and enter `http://192.168.0.1/` in the URL field.

A log in screen displays.

3. Log in using the default user name `administrator` and the default password `password`.

The management module web GUI launches.

4. Click the **Settings** tab.
5. In the navigation tree on the left click **The configuration of network link**.

The **Management LAN network** pane displays.

6. Scroll down and click the **Edit** button in the **Management LAN network** pane.

The fields become editable.

7. Enter an IP address, subnet mask and default gateway in **The management module** section and an IP address, subnet mask and default gateway in the **Partition** section for each active partition (blade).

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

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

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 so you can perform management through any system console in the management LAN.

Configure Blades

The following procedures must be completed for each active blade.

Configure Hitachi Compute Blade 2000 to Boot from SAN

To configure the Hitachi Compute Blade 2000 to boot from SAN please follow these Steps:

1. Open a browser and enter the blade IP address.
2. Log in to the blade web GUI using the following default user name **user01** and default password **pass01**.

The blade web GUI launches.

3. Click the **Launch Remote Console** button

The Remote Console will open in a new Window.

4. From the Top Menu Bar select **Power and Reset > Power On**
5. A warning message pop up appears confirming the server will be powered on choose the **Yes** button
6. During the System boot **Press <Ctrl-R> to ENTER BIOS** when prompted.

This message appears on the screen **<Ctrl-R> Detected. Please Wait...**

7. From the **<< Select Operation >>** screen use the up and down buttons on your keyboard to highlight **SELECT HBA** option and press Enter button on your keyboard.

The **<< SELECT HBA >>** screen opens in the same window with a list of available HBA's.

8. From the **<<SELECT HBA >>** screen use the up and down buttons on your keyboard to select the first HBA to configure for SAN boot

The **<< MAIN MENU >>** screen of the Selected HBA is shown on the same screen.

9. Press Enter on your keyboard to select the first highlighted option **1. SET HBA BIOS ENABLE/DISABLE**

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

10. Press Enter on your keyboard to change the **HBA BIOS:** from **DISABLE** to **ENABLE**

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

11. Press ESC on your keyboard to go back to the **<<MAIN MENU >>** screen.

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

12. Press the down arrow on your keyboard to highlight option **2. SET BOOT PRIORITY.**

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

13. Press Enter on your keyboard to change the **BOOT PRIORITY:** from **DISABLE** to **ENABLE**

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

14. Press the down arrow to highlight the **1. Boot priority** option

The Highest **BOOT Priority** is highlighted

15. Press Enter on your Keyboard to discover the provisioned LUN from Storage.

The **<< SELECT BOOT DEVICE >>** screen appears on the same screen. At this screen please 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.

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. Highlight the **YES: SAVE SETTING** at the **<< SETUP CONFIRMATION >>** screen

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

The configuration for Boot from SAN is now configured.

21. From the Top Menu Bar click **Power and Reset > Power Off**

Configure Hitachi Compute Blade 2000 to Boot from Windows Server 2003 Installation ISO image.

This procedure assumes that the remote console session from the “Configure Hitachi Compute Blade 2000 to Boot From SAN ” procedure is still open. To mount the Windows 2003 Enterprise Edition ISO image from a remote DVD, follow these steps:

1. From the top menu bar, select **Remote CD/DVD > Redirect CD/DVD Image.**

The **Open** window Displays.

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

The **Open** window closes and you are returned to the Remote Console Screen.

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

The Windows 2003 server installation DVD will now start.

Deploy the Windows Server 2003 Operating Systems

After the blade boots from the ISO image, follow Microsoft's instructions to complete the installation, specifying the Hitachi HBA driver, Windows Server 2003 Enterprise Edition (full installation) and a strong password for the local Administrator account. You must install Windows 2003 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 server and the SAP ABAP server. Both servers have the same layout.

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

<i>Host LUN</i>	<i>File System Mount Point</i>	<i>Usage</i>
0000	C: \	Host Operating System and Microsoft SQL server 2005 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 letter M:\ mount points on both SAP Solution Manager and SAP ERP.

Deploy the Microsoft SQL Server 2005 for SAP

Microsoft SQL Server 2005 software must be installed prior to the installation of any SAP instance. For more information about the advanced configuration of the Microsoft SQL Server 2005 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 2005 see the [SAP Installation Guide](#) for SAP ERP 6.0

For information about the most recent update for Microsoft SQL server 2005 that is supported by SAP see the SAP note [62988](#) .

Deploy SAP Solution Manager Software

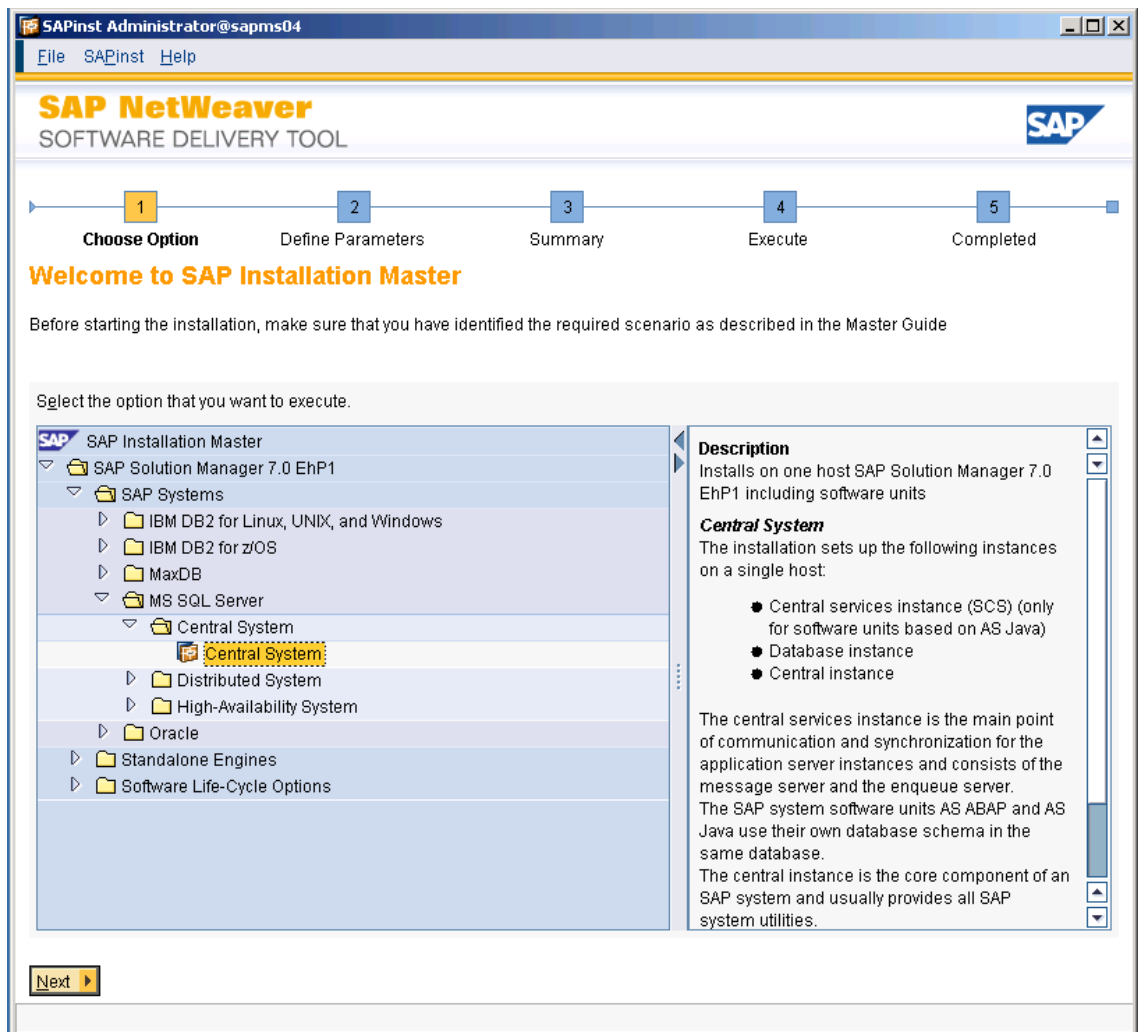
Install SAP Solution Manager on a dedicated Hitachi Compute Blade 2000. The following steps are an overview of the installation of SAP Solution Manager, for more information, see the [SAP Solution Manager](#) page for release 7.0 EHP 1 which is available to licensed SAP customers:

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

To install the SAP Solution manager software, follow these steps:

1. Copy the SAP Solution Manager software from the installation media to the desktop or local drive on the Windows 2003 Operating System.
2. Execute the **sapinst.exe** from the Master Installation media.

SAP Installation Master Launches



3. Choose the Central System service by navigating the service tree as follows:

SAP Solution Manager 7.0 EhP1 > SAP Systems > MS SQL Server > Central System > Central System

4. Identify and provide the parameters as prompted by SAP Installation Master.

The screenshot shows the SAP Installation Master interface. At the top, a progress bar indicates five steps: 1. Choose Service, 2. Define Parameters (highlighted in yellow), 3. Check Parameters, 4. Execute Service, and 5. Completed. Below the progress bar, the title 'SAP System > Central and SCS Instance' is displayed in orange. The main content area is titled 'Enter the central and SCS instance parameters'. It contains two sections: 'Central Instance Parameters' with input fields for 'ABAP Message Server Port' (value: 3600) and 'Internal ABAP Message Server Port' (value: 3900); and 'SCS Instance Parameters' with an input field for 'Internal SCS Message Server Port' (value: 3901). Below these fields is an 'Additional Information' section with a note: 'The instance-specific *Internal Message Server Port* for internal communication and the *Message Server Port* are required as a unique communication channel.' At the bottom of the form are 'Back' and 'Next' navigation buttons.

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



5. Review the **Parameter Summary**. Provide any input required by SAP Installation Master during the execution phase.

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

Deploy SAP ABAP Software

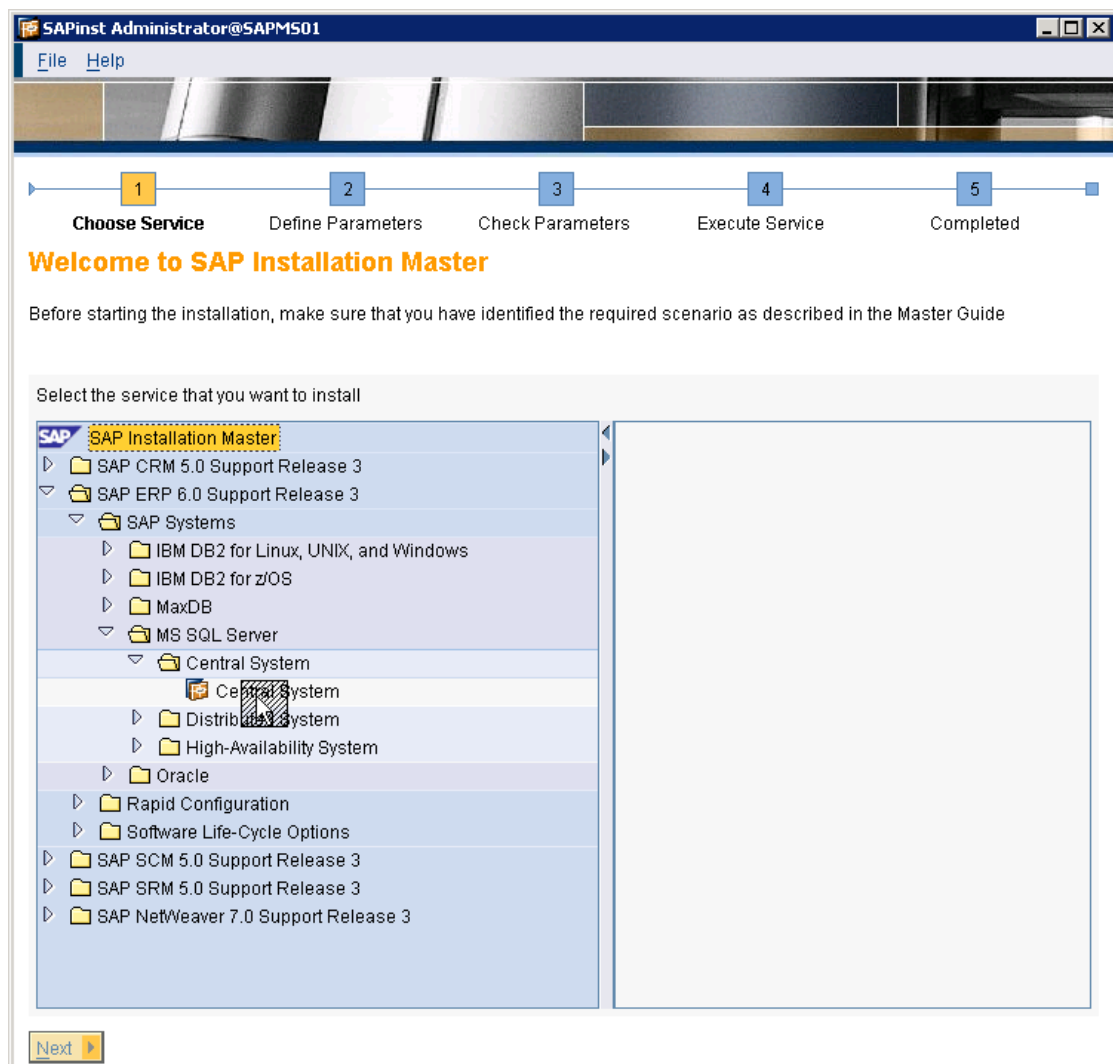
Install SAP ERP on a dedicated server for a central instance. These steps are intended to give you an overview of the installation of the SAP ABAP instance, for more information, see the [SAP ERP - Installation and upgrade Information](#) page for SAP ERP 6.0 which is available to licensed SAP customers:

- **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 ABAP Software, follow these steps:

1. Copy the SAP ERP 6.0 software from the installation media to the desktop or local drive on the Windows 2003 Operating System.
2. Execute the **sapinst.exe** from the Master Installation media.

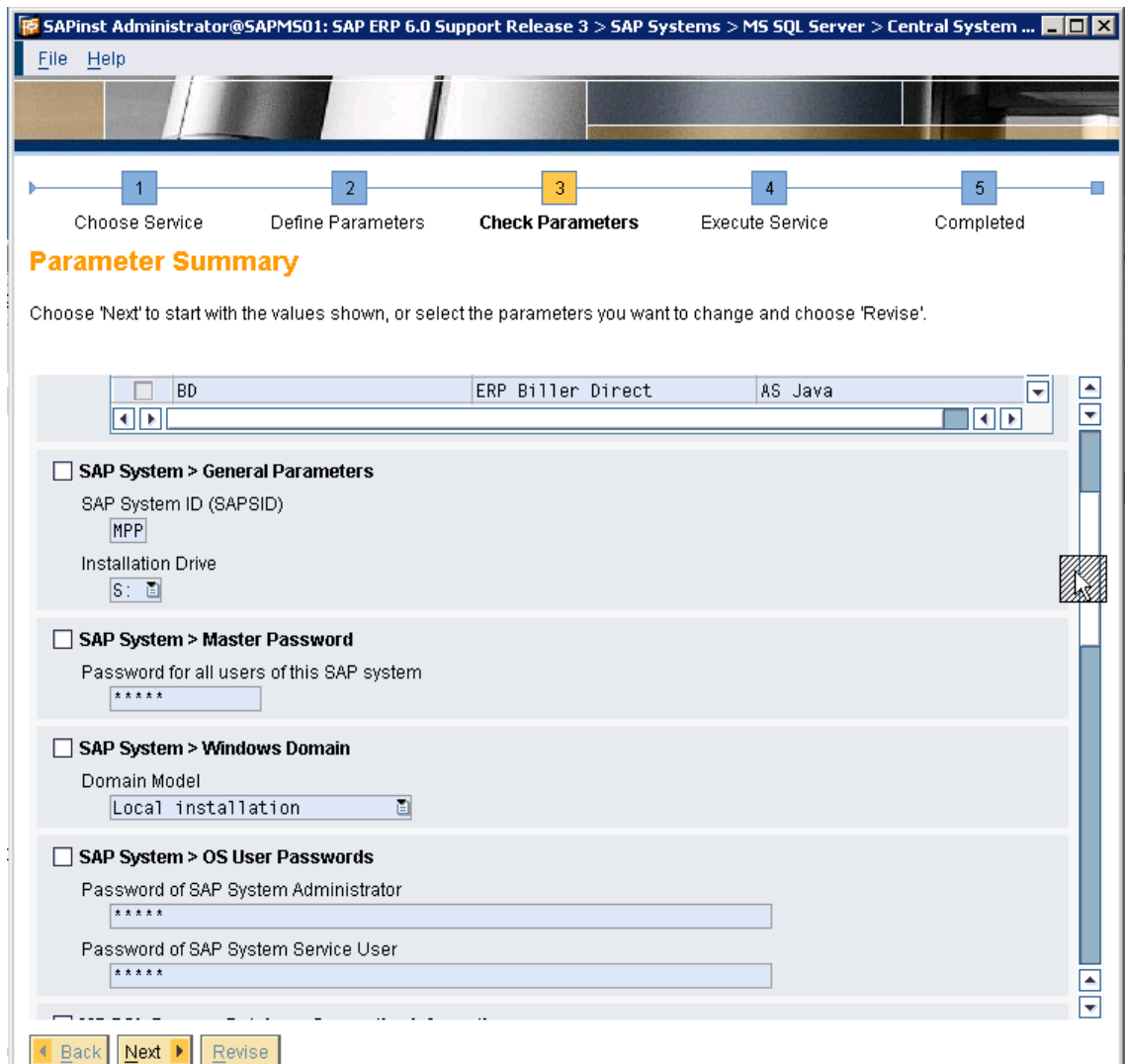
SAP Installation Master launches.



3. Choose the Central System service by navigating the service tree as follows:
SAP ERP 6.0 Support Release 3 > SAP Systems > MS SQL Server > Central System > Central System
4. Identify and provide the parameters as prompted by SAP Installation Master.



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



5. Review the **Parameter Summary**, Provide any input required by SAP Installation Master during the execution phase.

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

Upgrade SAP Instances

This solution also requires the installation of SAP Enhancement Pack 4 for the ABAP instance. For more information about upgrading an SAP ERP 6.0 system to Enhancement Pack 4, see the following SAP guides, which are available to licensed customers at the [SAP Service Marketplace](#):

- **Master Guide** — SAP enhancement package 4 for SAP ERP 6.0
- **Must Know Guide** — Overview of the fundamental changes and the new implementation procedure
- **How to Install SAP Enhancement Package 4 Guide** — Step-by-step installation instructions

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