Installation Information

Installing and Configuring a Standalone Java 6.40 SR1 System on Windows with MSCS: MS SQL Server

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SAP AG
Neurottstraße 16
69190 Walldorf
Germany
T +49/18 05/34 34 24
F +49/18 05/34 34 20
www.sap.com

Typographic Conventions

Type Style	Description
Example Text	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options.
	Cross-references to other documentation
Example text	Emphasized words or phrases in body text, graphic titles, and table titles
EXAMPLE TEXT	Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE.
`Example text`	Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
`Example text`	Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.
`<Example text>`	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
EXAMPLE TEXT	Keys on the keyboard, for example, *F2* or *ENTER*.

Icons

Icon	Meaning
	Caution
	Example
	Note
	Recommendation
	Syntax

Contents

Installing and Configuring a Standalone Java 6.40 SR1 System

1 Introduction

This documentation explains how to install and configure your Java 6.40 SR1 system on Windows with Microsoft Cluster Service (MSCS) when your database is SQL Server.

It is written for experienced database administrators and technical consultants who are familiar with the Windows operating system and with Microsoft Cluster Service.

For this type of installation, you have to set up the system on two clustered hosts (called “MSCS nodes”) and configure it so that it can take advantage of the MSCS software. The MSCS software offers features that can improve the availability of the system and safeguard it against unplanned downtime. Ideally it enables 24-hour operation, 365 days a year.

With MSCS you enable critical system components, so-called Single Points of Failure (SPOFs) to be automatically switched from one machine to the other, if hardware or software problems arise on one machine. With the help of this switchover – or failover – the system can continue functioning normally so that unplanned system downtime is avoided.

Apart from enabling failover when hardware or software problems occur, you can also use MSCS during system maintenance work. If you need to maintain one node, you can deliberately switch the cluster resources to the other node and temporarily operate it there while maintenance is in progress. When maintenance work is finished you can easily move the resources back to their original node and continue operating them there.

1.1 Java System LandscapeJava System Landscape

In a Java standalone system you have the following components:

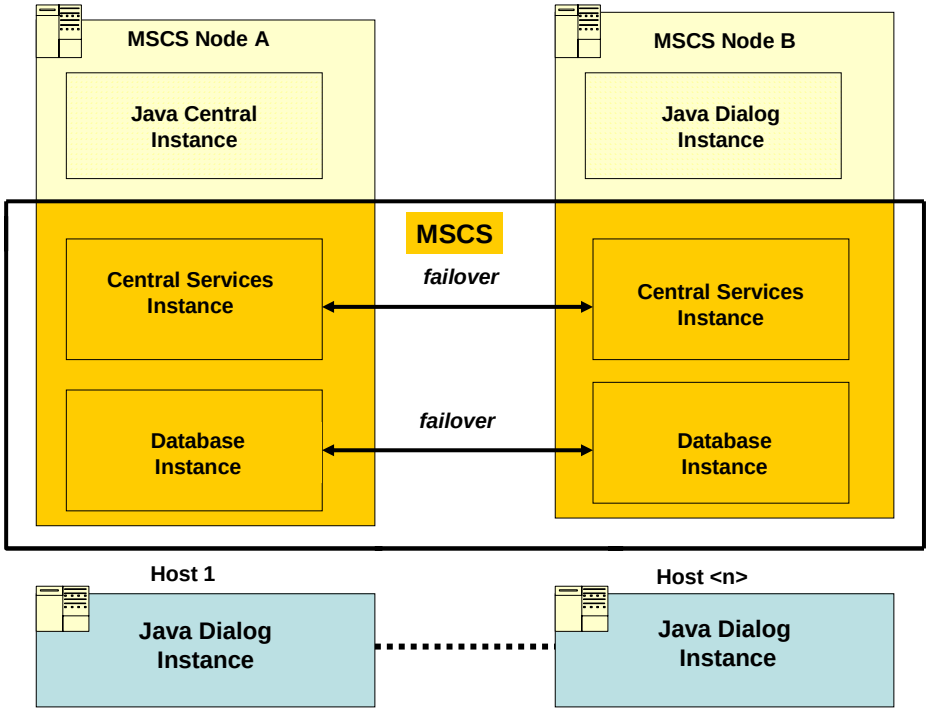
Component	Number of Components per Java system	Single Point of Failure
SCS instance (message services and enqueue services)	1	yes
Database instance	1	yes
Application server Java central instance, Java dialog instance	1 – n	no

- To protect the SPOFs (SCS instance and database instance) you have to use MSCS.

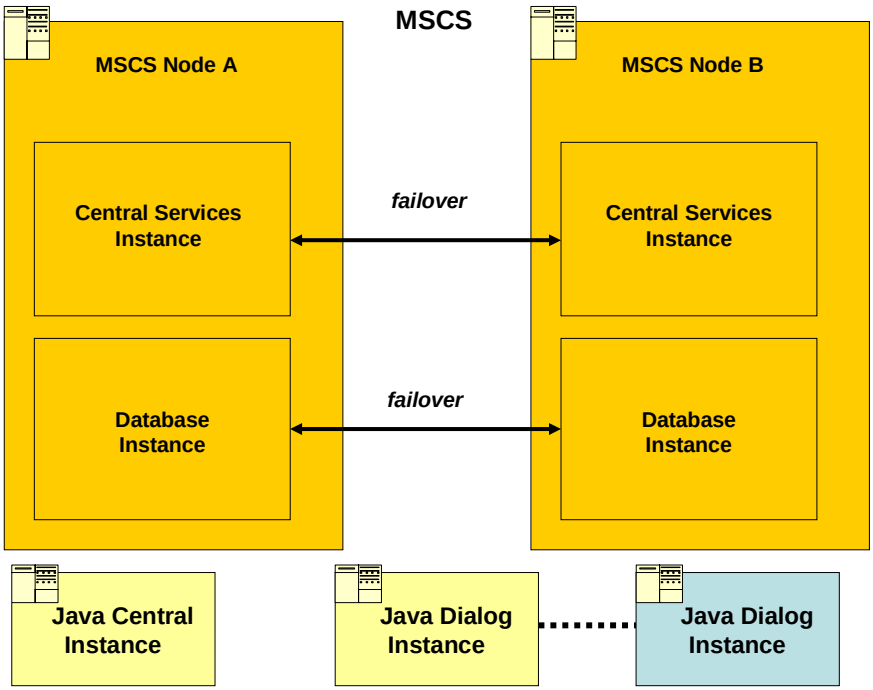
  If a hardware or software problem occurs the clustered SCS instance and the clustered database automatically fail over to the other.

  If you need to maintain the node where the SCS instance and database are running you can switch these instances on the other node. When maintenance work is finished you move the SCS and database instance back to the original node.

- To protect system components that are non-SPOFs, for example application servers, you have to install them as multiple components. In this case you must install at least two application servers (one central and at least one dialog instance) on two different hosts. You have the following options:
  - You install the central instance and the dialog instance on two MSCS nodes. Any additional application servers (dialog instances) are installed outside of MSCS. The J2EE Engine has to be installed on a local disk. If the J2EE Engine is installed on an MSCS node to be maintained, you have to stop the J2EE Engine. When you have finished maintenance, you restart the J2EE Engine.



- You install the central instance and all dialog instances outside of MSCS on different hosts. Only the SCS instance and the database instance are installed on the cluster nodes.



2 Planning

You need to plan the cluster installation for your Java system.

In the following the two machines in the cluster are referred to as MSCS node A and MSCS node B.

Process Flow

1. You have to read the installation documentation [Page 8].
2. You distribute components to disks for MSCS [Page 9].
3. You obtain IP addresses for MSCS [Page 11].
4. You check the hardware and software requirements for MSCS [Page 16].

The cluster hardware is equipped with two sets of disks:

- Local disks that are attached directly to one of the nodes
- Shared disks that can be accessed by both nodes via a shared interconnect.

You need to work out which components have to be stored on local disks, which on shared disks, and which have to be separated to different disks for performance and security reasons.

2.1 Installation Documentation

Before you begin the installation, read:

- The following SAP Notes as they contain the most recent information as well as corrections to this documentation.

Note Number	Description
787451	MSCS-specific information about the Web AS 6.40 SR1 Java system installation and corrections to the documentation.
786608	Windows-specific information about the Java system installation and corrections to this documentation.
786671	MS SQL Server-specific information about the Web AS 6.40 SR1 system installation and corrections to this documentation.

- The current installation guide *SAP Web Application Server 6.40 SR1 <Java> on Windows: MS SQL Server*, which is available on SAP Service Marketplace at: **`service.sap.com/instguidesNW04`** → *Installation* → *SAP Web AS* → *SAP Web AS 6.40 SR 1 and Related Documentation*

  This guide contains important general information about the standard installation of an SAP system.

2.2 Distribution of Components to Disks for MSCS

Keep in mind that the cluster has the following different sets of disks:

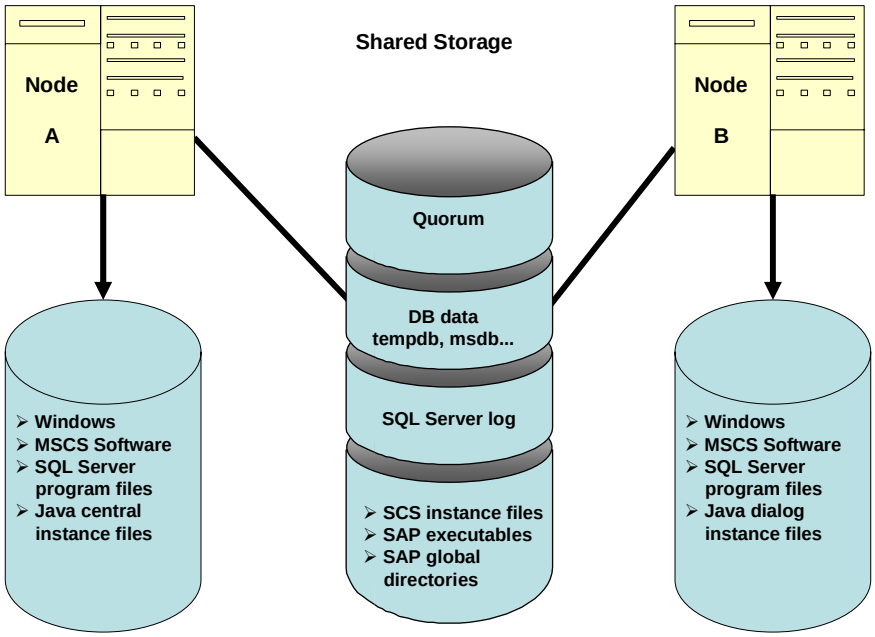
- Disk arrays connected locally to MSCS node A
- Disk arrays connected locally to MSCS node B
- Disk arrays connected to both MSCS nodes A and B with a shared bus, providing shared storage for both MSCS nodes

You need to install system components in both the following ways:

- Separately on both MSCS nodes A and B to use the local storage on each MSCS node
- Once on the shared storage that is used in common by MSCS nodes A and B

The following graphic illustrates how you distribute the software to different volumes of a RAID system during the installation. You need to locate the database data files, the SAP program files (executables), and the quorum resource on **different** RAID volumes. This configuration is required so that the SAP system and database can be switched as separate units during failover.

Software Distribution in an MSCS System with RAID for MS SQL Server



Quorum Disk

The MSCS quorum disk is unique to a cluster installation and is always owned by one of the MSCS nodes. It has the following main functions in the cluster:

- It logs changes to the cluster configuration that are entered in the *Registry*.

- It arbitrates between competing MSCS nodes when the communication between MSCS nodes breaks down. This means that cluster resources are forced to fail over to the MSCS node that owns the `quorum` disk.

The default quorum log size is 64 MB. If you use a large number of shares, the quorum disk size may be too small.
To increase the quorum log size, carry out the following steps:
a. Right-click the cluster group and choose *Properties*.
b. Select *quorum log* and increase the value to 4096 in the Size box.
For more information, see also the *Microsoft Knowledge Base Article 225081*.

Database Directories

As shown in the graphic above, you must distribute the database directories so that they:

- Do not reside on the same RAID volumes as the SAP program files or the quorum resource.
- Reside on several different RAID volumes for security reasons

2.2.1 Directories in an MSCS Configuration

The following tables show the directories where the main software components for the SAP cluster installation are stored:

Directories on Local RAID Volumes on both MSCS nodes A and B

Component	Default Directory
A supported operating system [Page 16]	`%windir%`
MSCS Software	`%windir%\Cluster`
SAP cluster files	`%windir%\SAPCluster`
MS SQL Server Program files	`\Program files\ \Microsoft SQL Server`

Directories on shared volumes

Component	Default Directory
Cluster *quorumresource*	`\MSCS`
SAP global and SCS instance directories	`\usr\sap...`
`tempdb` databases	`\TEMPDB`
`msdb`, `model`, `master`	`\mssql`
SAP data files	`\<SAPSID>DATA1`
SQL Server log files	`\<SAPSID>LOG<n>`

SapCluster Directory

In an SAP cluster installation, an additional directory has to be created manually under the system directory: `%WINDIR%\SapCluster`
This contains all the SAP files required by both cluster nodes, independently of the MSCS

node the SAP instance is running on. The files are database tools and program files (executables) used by the operating system monitor (SAPOsCol).
The directory is added to the path variable of the user `<sapsid>adm`.

2.3 IP Addresses in an MSCS Configuration

A part of the installation process that is unique to a cluster is the configuration of host names and IP addresses in the network. This is a particularly important task because the addressing plays a key role in the switchover procedure. Addressing must be set up correctly so that the system can take advantage of the cluster functionality and switch between MSCS nodes when hardware problems arise.

This section explains the different types of addresses and their function in the switchover mechanism of the cluster.

Types of IP Addresses

In a correctly configured cluster, there are seven IP addresses and corresponding host names. Some of the addresses are physical addresses that are assigned to the **network adapters** (cards), others are virtual addresses that are assigned to the **cluster groups**.

Physical IP Addresses Assigned to Network Adapters

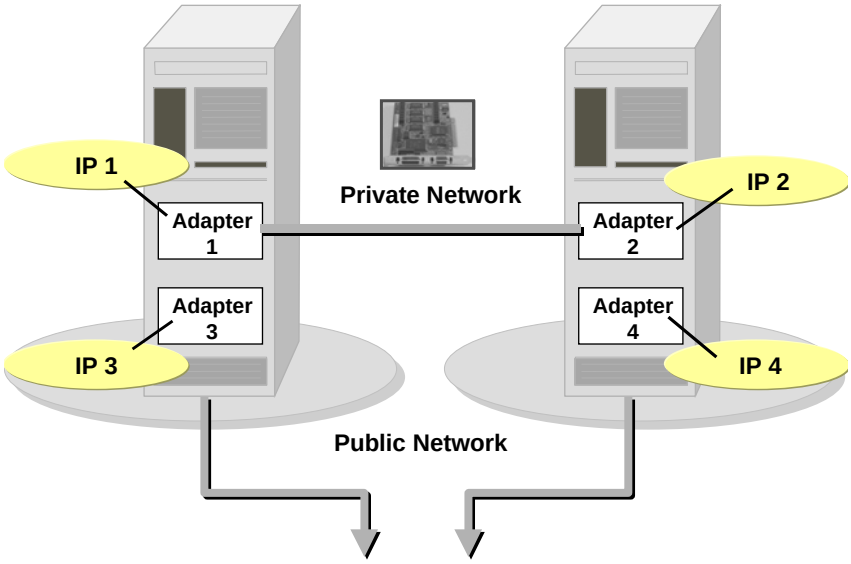
An MSCS configuration usually has two networks:

- A public network that is used for the communication between the central instance, application servers and the LAN.
- A private network that is used internally for communication between the MSCS nodes of the cluster.

To set up these two networks, each MSCS node needs an adapter for both the private and public network. This means that each MSCS node must have an adapter for the private network and an adapter for the public network and each of these adapters has its own physical IP address and corresponding host name.

For more information on network configuration, see also the Microsoft Knowledge Base Article 259267.

The graphic illustrates the adapters required for the public and private networks, and their corresponding physical IP addresses. A physical address, as opposed to a virtual one, is stationary and permanently mapped to the same adapter.



Host Names Assigned to Network Adapters

Each of the physical IP addresses of the network adapters must have a corresponding host name. For example, on the left-hand MSCS node above, you might assign the IP addresses of the public and private network adapters as follows:

IP Addresses and Host Names

Network Adapter	IP Address	Host Name
Adapter 1 (private network)	10.1.1.1	`clusA_priv`
Adapter 3 (public network)	129.20.5.1	`clusA`

Make sure that you are aware of the following:

The IP address and host name of the **public** network adapter is also the IP address and name of the machine. In the above example, this means that the machine that is the MSCS node on the left has the name `clusA`.

- Do **not** confuse the **host name** with the **computer name**. Each MSCS node also has a computer name, which is often the same as the host name, but is written in uppercase.

  The computer name is displayed in the MSCS node column of the *Cluster Administrator*. However, it is **not** required for the TCP/IP communication in the cluster. When you configure IP addresses and corresponding names, keep in mind that it is the **host names** that are important for the cluster, not the computer names.

Virtual IP Addresses Assigned to Cluster Groups

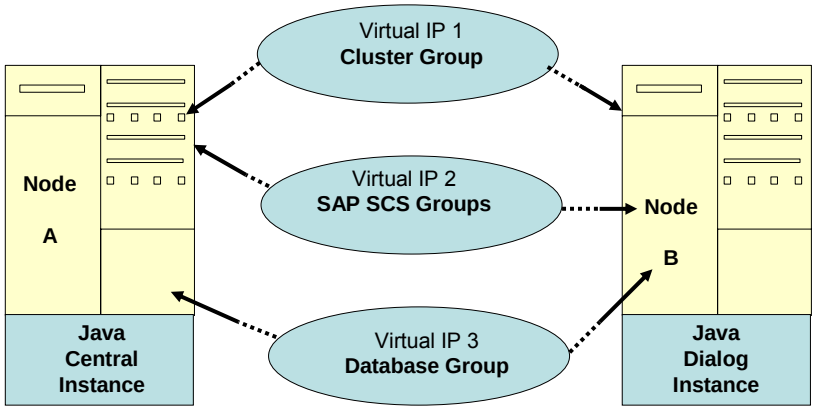
When you have installed the SAP system and fully configured the cluster, the critical system resources are bound together in three different **groups**. Each of these groups requires a virtual IP address and host name that is permanently mapped to the group and not to a particular MSCS node. This has the advantage that, whenever a group is moved between MSCS nodes, its IP address and host name move together with it.

A cluster configuration has the following groups:

- SAP SCS cluster group
- Database cluster group
- Cluster group

Each group consists of a set of related resources that work together to offer a service to the system. For example, the database cluster group comprises all the resources that enable the database server to fulfill the requests of a client. When the group is moved from one MSCS node to the other, due to MSCS node failure, the virtual IP address and host name move with it. Therefore, there is a failover not only of resources, but also of the virtual IP address and host name. As a result, all clients can still reach the database server with the same address as before.

The following graphic illustrates how the virtual addresses of the database group and SAP group can move from one MSCS node to the other when failover occurs.



2.3.1 Obtaining IP Addresses for MSCS

Use

You need to correctly configure IP addresses for a cluster system. During the installation procedure you have to assign seven IP addresses and host names. You normally obtain these names and addresses from the system administrator.

Prerequisites

- If you are installing Windows for the first time on your system, follow the procedure “Obtaining IP Addresses” below.
- If Windows has already been installed on your system, the host names and IP addresses of the network adapters (cards) have already been defined and exist in your system.

  This means that you can find out the IP addresses for the network adapters using the procedure “Determining Existing IP Addresses” below.

  However, you still need to also use the table “Virtual IP Addresses” in the procedure “Obtaining IP Addresses.”

Procedure

Obtaining IP Addresses

Ask the system administrator to give you the addresses and host names listed in the tables below. You will need to enter them later during the installation process.

The column *Defined During* indicates at which stage of the installation the addresses are defined in the system.

Use the names **exactly** as specified by the system administrator, carefully observing upper and lowercase letters.

Physical IP Addresses

Component	Example for Physical IP Address	Example for Physical Host Name	Purpose	Defined During
MSCS node A: adapter for private network	`10.1.1.1`	`clusA_priv`	Address for inter-MSCS node communication on the private network	Windows installation
MSCS node A: adapter for public network	`129.20.5.1`	`clusA`	Address of MSCS node A for communication with application servers and LAN (this is the same as the address of MSCS node A)	Windows installation
MSCS node B: adapter for private network	`10.1.1.2`	`clusB_priv`	Address for inter-MSCS node communication on the private network	Windows installation
MSCS node B: adapter for public network	`129.20.5.2`	`clusB`	Address of MSCS node B for communication with application servers and LAN (this is the same as the address of MSCS node B)	Windows installation

Virtual IP Addresses

Component	Example for Virtual IP Address	Example for Name (Host Name)	Purpose	Defined During or Before
Cluster group	`129.20.5.3`	`clusgrp`	Virtual address and name of the cluster group. It identifies the cluster and is used for administration purposes.	MSCS software installation
SAP SCS cluster group	`129.20.5.4`	`sapgrp`	Virtual address and name for accessing the group of SAP resources, regardless of the MSCS node it is running on	Installing the SCS instance on MSCS node A
Database cluster group	`129.20.5.5`	`dbgrp`	Virtual address and name for accessing the group of database resources, regardless of the MSCS node it is running on	Execution of MSCS Wizard or database-specific cluster scripts

Determining Existing IP Addresses

To find out the existing IP addresses and corresponding host names and addresses, proceed as follows:

1. Choose *Start* → *Settings* → *Network and dial-up Connections*.

   The *Network and dial-up Connections* window appears.

2. Select one of the network cards that are displayed and choose *File* → *Properties*.

   A dialog box opens.

3. Choose *TCP/IP Protocol* → *Properties*.

   The *TCP/IP Properties* dialog box appears and shows the IP address of the initially selected network card.

4. To find out the host name that is mapped to the IP address, use the `ping` command:

   `ping -a <IP_Address>`

   The system returns the host name assigned to the IP address.

   Do not forget to ping your local machine as well.

5. Repeat these steps for the other network cards.

2.4 Checking Hardware and Software Requirements for MSCS

Use

When you install the SAP system on cluster hardware, you have to meet the hardware and software requirements shown below. This makes sure that the system can take advantage of the MSCS functionality and achieve an acceptable performance level.

Procedure

1. Check that your cluster hardware is certified.

   AddOn Technology Center for SAP (AddOn TCS) certifies hardware platforms for SAP on Microsoft Windows. The cluster must be included in the Microsoft list of certified clusters and its components. You can access the lists at the following Internet addresses:

   `www.microsoft.com/hcl`

   `www.saponwin.com`

2. Make sure that both MSCS nodes of the cluster are connected by a private and public network:
   - The public network enables communication from the MSCS nodes of the cluster to other resources in the local area network (LAN).
   - The private network enables internal communication between the MSCS nodes. In particular, it enables the *Cluster Service* running on both MSCS nodes to regularly exchange messages on the state of the MSCS nodes so that the failure of resources is quickly detected.

3. Check that sufficient storage space is available.

   Each of the MSCS nodes in the cluster must have its own local disks and have access to shared disks that can be reached by both MSCS nodes via a shared bus.

   All software – except the Windows operating system, the SQL server system database executables, the MSCS software executables, and the Java application server instance – is stored on the shared disks. One of the shared disks must be used exclusively by the Quorum resource that stores the cluster registry and records information about the state of the cluster.

Disks	Minimum Disk Space	How to Check
1 local disk on each MSCS node	3 GB (plus 2 GB for each installation DVD)	1. Choose *Start* → Programs → *Administrative Tools* → *Computer Management* → *Disk Management*. 2. Right-click the disk and choose *Properties*.

Disks	Minimum Disk Space	How to Check
At least 4 shared disks	1 GB	1. Choose *Start* → Programs → *Administrative Tools* → *Computer Management* → *Disk Management*. 2. Right-click the disk and choose *Properties*.

All disk controllers must be able to support hardware-based RAID.

4. Check the RAM and paging file size on each MSCS node:

Requirement	How to check
Minimum RAM: 1 GB	In the *Windows Explorer* choose *Help* → *About Windows*.
Paging File Size: • 32-bit: 1 GB plus 3 times RAM. Maximum required is 10 GB. • 64-bit: At least 20 GB	1. Right-click *My Computer* and choose *Properties*. 2. Choose *Advanced* → *Performance Options*. 3. If required, in section *Virtual Memory*, choose *Change*.

5. Check that the software you install on the MSCS nodes meets the following requirements:

Software Requirement	How to Check
English international version of one of the following: • Windows Server 2003 Enterprise Edition • Windows Server 2003 Datacenter Edition • Windows 2000 Advanced Server with at least service pack 4 • Windows 2000 Datacenter Server with at least service pack 4	To check the Windows version, open a command prompt and enter the command **`winver`**

For any version of Windows 2000, you need at least service pack 4. For more information on the

latest service pack supported by SAP, see **SAP Note 30478**.	
• MS SQL Server 2000 Enterprise Edition • Latest Service Pack for MS SQL Server • Latest hotfix, if available • The new collation for MS SQL Server	• For more information on the current Service Pack for MS SQL Server, see **SAP Notes 62988**. • For more information on the current hotfix for MS SQL Server, see **SAP Notes 608651**. • For more information, refer to Installing the Corrected MS SQL Server Collation [Page 26]
MSCS software	–
Suitable Windows Resource Kit is strongly recommended	–

3 Preparation

Purpose

Before you install the Java system, you need to prepare the system for MSCS.

Prerequisites

Make sure that you have finished the installation planning [Page 8], especially the hardware and software requirements [Page 16].

You **cannot** use a host with a domain controller as a cluster node.

- On **both nodes**, you have installed the operating system [Page 16] with the option *Cluster Service*. For more information, see the Windows documentation.

When you install the *Cluster Service*, you specify a separate, shared disk for the quorum resource.

Process Flow

1. On both nodes, you manually assign drive letters to the shared disks [Page 19] using the *Windows Disk Administrator.* Both nodes must access the shared disks with the same drive letters.
2. On **both nodes**, you adjust the size of paging file and the file cache. For more information, see hardware and software requirements [Page 16] and “Reducing the Size of File Cache” [Page 20].
3. You map the seven IP addresses to host names [Page 20] on the Domain Name Server (DNS) or in the `hosts` file.
4. On **both nodes**, you check the mapping of host names for MSCS [Page 21].
5. In the *Cluster Administrator*, you move all disk groups and the cluster group to node A [Page 26].
6. On **node A**, you install a default SQL Server instance.

   Use the option to create a new **virtual** server. The installation procedure differs whether you are using a 32-bit or 64-bit system. For more information, see Installing the Database Software in a Cluster [Page 22].

3.1 Assigning Drive Letters for MSCS

Use

We recommend that you assign drive letters for MSCS.

In a cluster, the shared disks that can be accessed by both nodes via a common bus must be addressed by both nodes with the same drive letters.

Procedure

1. Choose *Start* → *Programs* → *Administrative Tools* → *Computer Management* → *Storage* → *Disk Management*.

2. Select a disk and choose *Action* → *All tasks* → *Change drive.*
3. Enter a new drive letter.

3.2 Reducing the Size of the File Cache

Use

The Windows file cache directly competes with SAP programs for working memory by pushing them out of the memory. Therefore, you should minimize the file cache as described below.

Procedure

1. Do one of the following:
   - **Windows Server 2003:**

     Choose *Start* → *Control Panel* → *Network Connections* → *Local Area Connections*.
   - **Windows 2000:**

     Choose *Start* → *Settings* → *Control Panel* → *Network and Dial-up Connections* and double-click *Local Area Connections*.
2. In the *Local Area Connection Status* dialog box, choose *Properties*.
3. In the *Local Area Connection Properties* dialog box, double-click *File and Printer Sharing for Microsoft Networks*.

   If you cannot select *File and Printer Sharing for Microsoft Networks*, this option has not yet been installed. To install it, you need the *Windows Server* CDs.
4. Select *Maximize data throughput for network applications*.
5. To confirm your entries, choose *OK*.

3.3 Mapping Host Names to IP Addresses for MSCS

Use

To enable correct operation of the failover mechanism, you have to map all IP addresses in the cluster to host names. The mapping enables the system to translate host names into IP addresses. Host names are normally used for administrative tasks because they are easier to use than the long, numeric IP addresses. The system can only respond to host names if they are translated into IP addresses with the information stored on a DNS Server or in the `hosts` file.

Prerequisites

- You have the list of addresses [Page 13].
- You have installed the Windows operating system.
- You have entered **all** seven IP addresses required for the cluster configuration.

  Missing or incorrect entries for the IP addresses can cause problems later during the installation:

- The names are case-sensitive.
- You need to enter the names exactly as specified by the system administrator.

Procedure

To map the host names to the IP addresses, do one of the following:

- You map the host names to IP addresses on a Domain Name System (DNS) server.
- You map the IP addresses in the Windows `hosts` file.

  The `hosts` file is located in the default directory for Windows:

  `%SystemRoot%\system32\drivers\etc`

We recommend that you perform the mapping on a DNS server, because it only requires a single entry. If you perform the mapping in the Windows hosts file, you have to maintain the hosts file on both nodes of the cluster and on all application servers and front ends, as each host in the system has its own `hosts` file.

3.4 Checking the Mapping of Host Names for MSCS

Use

You need to check the mapping of host names to IP addresses [Page 20] because this is crucial for cluster operation.

Make sure that you perform this procedure. Otherwise you might have serious problems later.

Prerequisites

- You have mapped IP addresses to host names on the DNS Server or in the `hosts` file.
- Make sure that you check **all** IP addresses.

Procedure

1. For each IP address enter the following commands:

   `ping -a <IP_Address>`

   The system returns the host name that is assigned to the IP address.

   `ping hostname`

   The system returns the IP address that is assigned to the host name.

When you enter the ping command, you do not get a reply, if the host does not yet exist.
If the address you are checking already exists in the system, you also receive a reply from the host. For example, after the installation of Windows and the configuration of the network, you get a reply when entering the IP addresses of the network adapters.

2. Compare the output with your own record of addresses and host names and check for the following possible errors:
   - Incorrect output of uppercase and lowercase

     Make sure that you correct the error before proceeding with the installation.
   - Error in the network bindings

     If you enter the name of the **public** network adapter, which is usually also the name of the local host, and the system returns the IP address of the **private** network, there is an error in the network bindings. To correct the network bindings, do the following on **both** nodes:

     i. Choose *Start* → *Settings* → *Network and Dial-up Connections*

     The *Network and Dial-up Connections* window appears.

     ii. Choose *Advanced* → *Advanced Settings* → *Adapters and Bindings*

     The network cards of the private and public networks are displayed for the current node.

The card of the **public** network must be displayed **before** that of the **private** network.

If necessary, change the order in which the cards are listed by using the *Move Up* and *Move down* arrows.

3.5 Clustering the SQL Server Database

Use

With the following procedure, you can cluster the SQL Server database on 32-bit or 64-bit systems.

For more information about installing the SQL Server client software, see *Installing the MS SQL Server Database Software* in Chapter 2 of the installation guide *SAP Web Application Server 6.40 SR1 Java on Windows: MS SQL Server.* The guide is available on SAP Service Marketplace at: **`service.sap.com/instguidesNW04`** → *Installation* → *SAP Web AS* → *SAP Web AS 6.40 SR 1 and Related Documentation.* You require the client software to install the central or dialog instance on a host (application server) outside of MSCS.

Clustering the SQL Server Database on 32-Bit Systems

You perform the following steps on **node A.**

1. Log on to the host as a local administrator
2. Insert the MS SQL Server 2000 RDBMS DVD into your DVD drive.
3. To start the installation, run `autorun.exe` located in the MSSQL8_I386 directory of the RDBMS DVD.
4. Enter the required information as specified in the table:

Window	Input
MS SQL Server 2000 Enterprise Edition	Select *SQL Server 2000 Components.*
MS SQL Server 2000 Enterprise Edition	Select *Install Database Server.*  Use the option to create a new **virtual** server.
Welcome	Click *Next.*
Computer Name:	Enter the name of the virtual server and click *Next.*
User Information	Enter your personal information.
Software License Agreement	Choose *Yes.*
CD-Key	Enter the key specified in the file `SAPCDKEY.txt` in the root directory of the RDBMS DVD and choose *Next*.
Failover Clustering	• Enter the IP address and subnet mask of the virtual database server and click *Add.* • Select the public net for the network to use.
Cluster Disk Selection	Select the shared disk, where you want to put the data files and choose *Next*.  When you select a shared disk you can ignore the warning that the selected disk is a shared disk in a cluster. To proceed, confirm the warning.
Cluster Management	Select both nodes.
Remote Information	Enter a domain administrator user account for both nodes and choose *Next*.
Instance Name	Make sure that *Default* is selected and choose *Next.*
Setup Type	Select *Custom.* When you are asked in the Setup Type dialog for the destination folder for the program and data files, make sure that you install the: • Program files on a **local drive**. For more information, see Directories in an MSCS configuration [Page 10]. • Data files for the `master`, `pubs` and

Window	Input
	`msdb` databases on one of the **shared drive** of the MSSQL group (the default value for these files is the local disk).
Select Components	Select all components and choose *Next*.
Service Accounts	Select *Use the same account for each service* and enter the password for the displayed domain administrator account.
Authentication mode	For a Java system, select *Mixed mode* and choose *Next*.
Collation settings	Select *SQL Collations.* From the dropdown list, select *Binary order for use with the 850 (Multilingual) Character Set.*
Network Libraries	Leave the selection unchanged and choose *Next.*
Start Copying Files	Choose *Next*.
Choose Licensing Mode	Select your licensing mode.
Setup Complete	Click *Finish.*

5. Install the latest Service Pack and hotfix, if available, on Node A. The Service Pack and the hot fix will also be automatically installed on Node B.

   For the current version of the Service Pack for MS SQL Server that is supported by SAP, see **SAP Note 62988**. For information on the latest hotfix, see **SAP Note 608651**.

   If you have to reboot, move the *MSSQL* database group back to node A.

6. Install the corrected MS SQL Server collation [Page 26] on Node A.

7. If you have more than one disk in your *SQL Server* database cluster group, make sure that the *SQL Server* cluster resource is dependent on all physical disks.

   To check, perform the following steps:

   a. In the *Cluster Administrator*, under the database group, right-click on *SQL Server*, and take it offline.

   b. Double-click the *SQL Server* cluster resource.

   c. Under *Dependencies*, select *Modify*.

   d. Move all available disks shown under *Available resources* to *Dependencies*.

   e. Confirm your entries with *OK*.

   f. In the *Cluster Administrator*, under the database group, right-click *SQL Server*, and bring all resources of the SQL cluster group online.

Clustering the SQL Server Database on 64-Bit Systems

Perform the following steps on **node A**.

1. Log on to the host as a local administrator.
2. Insert the MS SQL Server 2000 RDBMS DVD in your DVD drive.
3. To start the installation, run `setup.exe` located in the directory `MSSQL8_IA64\IA64`
4. Enter the required information as specified in the table:

Window	Input
Setup Mode	• Select *Start a new installation.* • Select *Virtual Server.*
Registration Information	Enter your name and the product key specified in the file `SAPCDKEY.txt` in the root directory of the RDBMS DVD.
Software License Agreement	Choose *Yes.*
Virtual Server Name	Enter the virtual server name.
Cluster Group Selection	Select the cluster group for the virtual server resources.
Failover Clustering	• Select the public network to use. • Enter the IP address for the virtual server, and choose *Add*.
Instance Name	Make sure that *Default* is selected and choose *Next.*
Configure Nodes	Select the cluster nodes to configure.
Remote Account Information	Enter a domain administrator user account for your cluster nodes and choose *Next*.
Installation Folders	Select the destination folder for the program and data files. Make sure that you install the: • Program files on a **local drive**. For more information, see Directories in an MSCS configuration [Page 10]. • Data files for the `master`, `pubs` and `msdb` databases on one of the **shared drive** of the MSSQL group (the default value for these files is the local disk).
Service Account	Select *Use a Domain User account* and enter the password for the displayed domain administrator account.
Authentication Mode	• Select the authentication mode. For a Java system, choose *Mixed*

Window	Input
	mode. • Enter and confirm the *sa* login.
Security Enhancement: Cross Database Ownership Chaining	Leave selection unchanged and choose *Next*.
Collation Settings	Select *SQL Collations.* From the dropdown list, select *Binary order for use with the 850 (Multilingual) Character Set.*
Licensing Mode	Select the licensing mode and choose *Next*.
Ready to Install	Select *Install*.

8. Install the latest service pack and hotfix, if available for MS SQL Server on Node A. The Service Pack and the hot fix will also be automatically installed on Node B.

   For the current version of the Service Pack for MS SQL Server that is supported by SAP, see **SAP Note 62988**. For information on the latest hotfix, see **SAP Note 608651**.

9. If you have more than one disk in your *SQL Server* database cluster group, make sure that the *SQL Server* cluster resource is dependent on all physical disks.

   To check, perform the following steps:

   a. In the *Cluster Administrator*, under the database group, right-click on *SQL Server*, and take it offline.

   b. Double-click the *SQL Server* cluster resource.

   c. Under *Dependencies*, select *Modify*.

   d. Move all available disks shown under *Available resources* to *Dependencies*.

   e. Confirm your entries with *OK*.

   f. In the *Cluster Administrator*, under the database group, right-click *SQL Server*, and bring all resources of the SQL cluster group online.

3.5.1 Installing the Corrected Collation for MS SQL Server

Use

When you install the MS SQL Server 2000 database for an SAP system, in the field *Collation Settings* we recommend that you select *Binary order for use with the 850 (Multilingual) Character Set.*

This means that all new databases and table columns will be created with this collation setting.

To view the default collation of MS SQL Server use the query:
`select serverproperty('collation')`
This query returns the default collation of the overall server. When you have selected code page `cp850`, it returns: `SQL_Latin1_General_CP850_BIN`

Unfortunately this collation setting does not sort Unicode data as it is required by an SAP system. To solve this problem, Microsoft provides a corrected collation as a hot fix (QFE) for SQL Server. The QFE is included in the hot fix you installed during the installation of the MS SQL Server database [Page 22].

When you have installed the hot fix, you have to run the executable `INSTCOLL.EXE` from SAP, as described below. For more information on `INSTCOLL.EXE`, see **SAP Note 600027**.

Prerequisites

- You have installed the MS SQL Server 2000 database. In the field *Collation Settings*, you selected *Binary order for use with the 850 (Multilingual) Character Set*.
- If you run your SQL Server in a **32-bit system**, you have installed SP3 and the latest hot fix. For more information, refer to **SAP Notes 62988** and **608651**.
- If you run your SQL Server in a **64-bit system**, you have installed the latest hot fix. For more information, see **SAP Note 608651**.

  Besides applying SP3 and the hot fix (32-bit) or the hot fix (64-bit) you do not have to make any changes on the client side (SAP application servers).
- To obtain a correct collation order with MS SQL Server, you have to use the new collation for all new installations of a Unicode or non-Unicode SAP system with the MS SQL Server database. New versions of the SAPinst installation tool check for the new collation.
- At present, there is no need to convert existing SAP system installations to the new collation.
- A new SAP system using the new collation and an existing SAP system that is using the old collation cannot run as two databases in the same MS SQL Server instance. If you want to install a new system on a database server with an existing system you have to apply the new collation with `INSTCOLL.EXE`.

Procedure

1. Download the `INSTCOLL.EXE` file, which is attached to **SAP Note 600027**, and extract it to your server.
2. Open a command prompt and change to the directory where you extracted the `INSTCOLL.EXE` file.
3. Enter the following:
   - For a default instance enter: `INSTCOLL.EXE`
   - For a named instance enter:

     `INSTCOLL.EXE -S<virt_server>\<instance>` (without any spaces after `-S`.)

   The collation executable starts the SQL Server Service if it is not already running and runs several checks.

   When you are asked to apply the new collation to all databases confirm with *Yes*.

   When the conversion has finished it stops the SQL Server Service.
4. To verify whether the MS SQL Server is properly configured, run:

   ```
   select serverproperty('collation')
   ```

You have to run `INSTCOLL.EXE` only once to apply the new collation. Do not install the collation after you have created or attached any SAP or non-SAP database. The `INSTCOLL.EXE` program checks for this and exits without applying the new collation.

Result

You can now continue with the standard SAP system installation and install any SAP instance on this server.

4 Installation

Purpose

You use the following procedure to install and cluster your Java system.

When you reboot during the installation process [Page 40], resources fail over to the second node. Therefore, after each reboot, you have to return the system to the state it had before the reboot.

Prerequisites

- You have completed the preparations [Page 19].

  To make sure that all preparation steps have been correctly performed, check that you can move the disk resources from one node to the other so that they are only accessible from a single node at any time.

- You are logged on as domain administrator.

  If for any reason, you are not granted domain administrators rights, you can perform the installation as a domain user who is a member of the local administrators group. However, the domain administrator has to prepare the system appropriately for you, as described in the Web Application Server installation guide. Do not use the user `<sid>adm` unless specified.

- On node A, in the *Cluster Administrator*, you make sure that all existing cluster groups are online.
- On node A, log off and log on again when you are prompted

Process Flow

1. On node A, you install the SCS Instance [Page 29].
2. You cluster the Java SCS instance manually [Page 30].
3. You install the Java central instance [Page 36].
4. You install an additional dialog instance [Page 37].
5. You install the J2EE Engine license [Page 38].
6. You configure SAP MMC for MSCS [Page 38].

4.1 Installing the SCS Instance on MSCS Node A

1. Create the SCS cluster group and add one shared disk where the SCS instance is to be located.
2. Add the virtual SCS IP and Network Name in the SAP cluster group and bring it online on node A.
3. Install a released JDK version.

   For more information on the required JDK version, see SAP Service Marketplace at **`service.sap.com/platforms`** → *Product Availability Matrix* → *SAP NetWeaver* → *SAP NetWeaver 04* → *SAP NETWEAVER 04* → *JSE Platforms*.
4. Add an environment variable `JAVA_HOME=<JDK_DIR>` and `PATH=<JAVA_HOME>\bin`

5. Start SAPinst with a virtual SCS host name variable as follows:
   a. Open a command prompt and change to the relevant directory of the Installation Master DVD:

      `<DVD>:\IM<xx>\SAPINST\NT\I386` (32-bit) or

      `< DVD>:\IM<xx>\SAPINST\NT\IA64` (64-bit)

   b. Enter:

      `sapinst product_ha.catalog SAPINST_USE_HOSTNAME=<SCS_virtual_host_name>` to use the virtual host name for the SCS installation.
6. Choose *SAP NetWeaver '04 Support Release 1* → *Java System* → *MS SQL Server* → *SCS Installation*.
7. If you install the SCS instance with SAPinst for the first time, you are asked to log off.

   In this case, choose *OK*.

   SAPinst logs off automatically.
8. Log on again.

   SAPinst restarts automatically.
9. Choose *Cancel* and stop SAPinst.

   To stop SAPinst, right-click the icon for the SAPinst output window located in the Windows tray and choose *Exit*.
10. Restart SAPinst manually from the command prompt with the previous command: `sapinst product_ha.catalog SAPINST_USE_HOSTNAME=<SCS_virtual_host_name>`.
11. Choose again *SAP NetWeaver '04 Support Release 1* → *Java System* → *MS SQL Server* → *SCS Installation*.
12. Select *Run a new installation* and choose *OK*.

    During the installation, the virtual host name will be used instead of the local host name. Make sure that get a pop-up warning that you are using a virtual host name.
13. Follow the instructions in the SAPinst dialogs and enter the required parameter values.

    The SCS installation drive must be a **shared** disk which belongs to the SCS cluster group.
14. Check that the SCS instance is running.

4.2 Clustering the Java SCS Instance Manually

Activities on MSCS Node A

1. Stop the SCS instance and services.
2. Add the following lines to **both the start and SCS** instance profiles:

   `DIR_INSTALL = <DISK>:\usr\sap\<SID>\SYS`

   `DIR_INSTANCE = <DISK>:\usr\sap\<SID>\SCS<InstanceNumber>`

```
SAPLOCALHOST = <SCSVirtualHostName>

SAPLOCALHOSTFULL = <SCSVirtualHostName>
```

In addition, change the content of the following lines of SCS instance start profile file `START_SCS<InstanceNumber>_<SCSVirtualHostName>:`

```
Autostart = 0
```

3. Extract `ntclust.sar` archive from the directory `<drive>:\SAPINST\NT\<platform>` with `sapcar.exe -xvgf <drive>:\SAPINST\NT\<platform>\ntclust.sar` to `<UNPACKED_TEMP_DIR>`
4. Copy the files `SapClus.dll`, `Saprc.dll`, `Saprcex.dll, insaprct.exe` from the `\NTCLUST\` directory to `%windir%\system32`
5. Run `insaprct.exe` in directory `%windir%\system32\` to register sap cluster dll
6. Change the `<SAPSID>adm` user environment as follows:
   a. Open a command prompt and enter `runas /profile /user:<domain>\<sid>adm regedit`
   b. Go to: HKEY_CURRENT_USER\Environment and change

   ```
   PATH=%PATH%;%windir%\SapCluster
   ```
7. Under *Services,* stop the following SAP services `saposcol`, `SAP<SID>_<SCSInst.No>`
8. Create the directory: `%windir%\SapCluster`
9. Copy the following files from `\usr\sap\<SID>\SCS<Inst_no>\exe` to `%windir%\SapCluster`:

   ```
   sapevents.dll

   sapntchk.exe

   saposcol.exe

   sapstartsrv.exe
   ```
10. Change sapservice config by opening a command prompt and typing: `sc config saposcol binPath= "%windir%\SapCluster\saposcol service"`
11. Adapt the SCS SAP<SID>_< SCS_inst_no.> service:
    a. Set it to *Manual* start
    b. Register the type library as follows:

    Start `sapstartsrv.exe` from the `%windir%\SapCluster\` directory and choose *Register COM Typelibrary only*.
12. Delete the SCS IP address and network name cluster resources from the SCS cluster group.
13. Start <UNPACKED_TEMP_DIR>\NTCLUSTER\crclgrp.exe
14. Enter the following parameters:
    - Cluster Name: <virtual cluster name – network name> (should be filled automatically)
    - Global disk: <share disk where SCS instance is located>

- Local Disk: <share disk where is SCS instance is located>
- Network name: <virtual SCS host name>
- IP address: <IP address of virtual SAP host name> (should be filled automatically)
- Subnet mask: `<subnet address mask of the public network>`

  For the public network name, look in `AdressMask` located in the registry key:

  `HKEY_LOCAL_MACHINE\Cluster\Networks\<public_netw_card_number>\`
- Network to use: `<public network name>`
  For the public network name, look in `Name` located in `HKEY_LOCAL_MACHINE\Cluster\Networks\<public_netw_card_number>\`

15. Finish creating the SAP Cluster group as follows:
    a. Run <UNPACKED_TEMP_DIR>\NTCLUSTER\ coclgrp.exe
    b. In the GUI enter:
       - Cluster Name: <is filled automatically>
       - SID: <J2EE_SID>
       - Instance: <SCS_Instance_Number>
16. Create the following registry keys and entries, if they do not exist:

    Registry keys:
    - HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\EventLog\Application\SAPOsCol
    - HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\EventLog\Application\SAP<SID>_<SCSInstanceNumber>

    Registry entries for `SAP<SAPSID>_<No.>` and SAPOsCol:

ValueName	ValueType	ValueData
TypesSupported	REG_DWORD	7
EventMessageFile	REG_EXPAND_SZ	%windir%\SapCluster\SAPEVENTS.DLL

Activities on MSCS Node B

Prerequisites

Make sure that on **Node A** all resources of the SAP SCS cluster group are online, except the SAP SCS cluster resource.

Procedure

1. Make the required dll files available
   a. **32-bit only:** Run `R3DLLINS.exe` in the directory `<DVD>\SAPINST\NT\<platform>\NTPATCH\`

   The `msvcr71.dll`, `msvcp71.dll`, `mfc71.dll`, and `mfc71u.dll` are extracted.

b. Open a command prompt in the local temp directory and enter `<DVD>:\IM<xx>\SAPINST\NT\<platform>\sapinst.exe –extract` to extract the archive

c. Copy all dlls from subdirectory `SYSTEM` to `%windir%\system32`.

d. Extract `ntclust.sar` archive from the directory `<DVD>:\SAPINST\NT\<platform>` with `sapcar.exe -xvgf`

`<DVD>:\SAPINST\NT\<platform>\ntclust.sar` to `<UNPACKED_TEMP_DIR>`

e. Copy the files `SapClus.dll`, `Saprc.dll`, `Saprcex.dll, insaprct.exe` from the `\NTCLUST\` directory to `system32`

f. Run `insaprct.exe` in directory `%windir%\system32\` to register sap cluster dll

2. Create local groups and add user accounts:

a. Create the local groups `SAP_<SID>_LocalAdmin` and `SAP_LocalAdmin`

b. Add the domain group `SAP_<J2EE_SID>_GlobalAdmin` into these local groups.

c. Add the domain group `SAP_<J2EE_SID>_GlobalAdmin` to the local Administrators group.

For more information on creating groups and adding users, see Creating and Adding New Groups and Users [Page 41].

3. Choose *Administrative Tools* → *Local Security Policy* → *Local Policies* → *User Right Assignment* to add the following privileges:

- <J2EE_SID>adm privileges
  - SeTcbPrivilege (Act as a part of the Operating System)
  - SeAssignPrimaryTokenPrivilege (Replace a process-level token)
  - SeIncreaseQuotaPrivilege (Increase Quotas) (for Windows 2000)
  - SeIncreaseQuotaPrivilege (Adjust memory quotas for a process (for Windows Server 2003)
- SAPService<J2EE_SID> privileges
  - SeServiceLogonRight (Log on as a Service)
  - SeNetworkLogonRight (Access this computer from the network)
  - SeDenyInteractiveLogonRight (Deny Logon Locally and Deny log on through Terminal Services)

4. Create the `<SID>adm` user environment as follows:

a. Open a command prompt and enter:
`runas /profile /user:<domain>\<sid>adm regedit`

b. Choose HKEY_CURRENT_USER\Environment and create the user environment in the same environment as on MSCS Node A.

5. Copy the services file located in `%windir%\system32\drivers\etc\` on Node A to Node B into the same directory.

The services file includes the following SCS ports:

sapdp <SCSInstanceNumber> Security Port	32<SCSInstanceNumber>/tcp # SAP System Dispatcher
sapdp<SCSInstanceNumber>s Security Port	47<SCSInstanceNumber>/tcp # SAP System Dispatcher
sapgw<SCSInstanceNumber>	33<SCSInstanceNumber>/tcp # SAP System Gateway Port
sapgw<SCSInstanceNumber>s Security Port	48<SCSInstanceNumber>/tcp # SAP System Gateway
sapms<SID>	36<SCSInstanceNumber>/tcp #SAP System Message Port

6. Move the SAP SCS cluster group to Node B.
7. Create the directory: `%windir%\SapCluster`
8. Copy the following files from `\usr\sap\<SID>\SCS<Inst_no>\exe` to `%windir%\SapCluster`:

   `sapevents.dll`

   `sapntchk.exe`

   `saposcol.exe`

   `sapstartsrv.exe`

9. Create saposcol in a command prompt:

```
sc create saposcol binPath= "%windir%\SapCluster\saposcol"
service start= auto obj= <domain>\SAPService<SAPSID> password=
<password_of_SAPService<SAPSID>_user>
```

Make sure that there is a space after each equal sign.

If you use Windows 2000, sc.exe is part of the Windows

10. Create `SAP<SAPSID>_<No.>` and reregister type library
    a. Run `sapstartsrv.exe` in directory `\usr\sap\<SID>\SCS<InstNo>\exe\`
    b. In the GUI enter the following:
       - SID: <J2EE_SID>
       - NR: <SCSInstanceNumber>
       - Startprofile: <disk>:\usr\sap\<SID>\SYS\profile\START_SCS<SCSInstanceNumber>_<SCSVirtualHostName>
       - User: <Domain>\SAPService<SID>
       - Password: <SAPService<SID> password>
       - Startup type: manual
       - Use Environment of user: <Domain>\<SID>adm
    c. Choose *OK*.
11. Reregister type library:

a. Run `sapstartsrv.exe` located in the directory `%windir%\SapCluster\`

b. Choose *Register COM Typelibrary only*.

c. Choose *OK*.

12. Register event log applications for `SAP<SAPSID>_<No.>` and saposcol as described in Step 16 of "*Clustering the Java SCS Instance Manually: Activities on MSCS Node A"*.

13. Registering SAP MMC

a. Extract the `SAPMMCU.SAR` (Unicode) archive from `<DVD>:\SAPINST\NT\<platform>\MMC\` with the command:

```
sapcar –xvf "<DVD>:\SAPINST\NT\<platform>\MMC\SAPMMCU.SAR"
```

b. Copy the files to `%windir%\system32`

If you cannot copy `librfc32u.dll` because the file is in use, stop the service `SAP<SID>_<No.>`.

c. Register all `sapmmc*.dlls` in a command prompt, for example:

```
%windir%\system32\regsvr32 sapmmc.dll
```

d. Create a desktop shortcut of `%windir%\system32\sapmmc.msc`

14. Start the SCS instance with the Cluster MMC and try failover from one node to another.

15. Remove the SAPLOC share from the SCS cluster group as follows:

a. Right-click the SAP SCS resource and choose *Properties*.

b. Select *Dependencies* and choose *Modify*.

c. Remove SAPLOC from the *Dependencies* list and choose *OK*.

16. Delete `saploc` in Cluster MMC.

17. Change the old name of the SAP cluster group and its cluster resources as shown in the following table:

Cluster group or Resource Type	**New Name**
SAP Cluster group:	*SAP <SAPSID>*
IP Address:	*SAP <SAPSID> IP*
Network Name:	*SAP <SAPSID> NetName*
SAP Resource:	*SAP <SAPSID> <SCS_InstanceNumber> Instance*

18. Create the generic service resource in the *Cluster Administrator* as follows:

a. Choose *File* → *New* → *Resource*

b. Under *New Resource*, enter or choose the following:

Name: `SAP <SAPSID> <InstanceNumber> Service`

Resource Type: *Generic Service*

Group: SAP <SAPSID>

c. Under *Possible Owners*, add both nodes.

d. Under *Dependencies*, add *Resource dependencies* to `SAP <SAPSID> SAPMNT`

e. Under *Generic Service Parameters,* for *Service Name* enter: `SAP<SAPSID>_<InstanceNummber>`

f. Choose *Next* and *Finish*.

19. In the *Cluster Administrator* check that the following dependencies are set:

SAP <SAPSID> NetName is dependent on *SAP <SAPSID> IP*

SAP <SAPSID> SAPMNT is dependent on *SAP <SAPSID> NetName and <Disk>*

SAP <SAPSID> <InstanceNumber> Service is dependent on *SAP <SAPSID> SAPMNT*

SAP <SAPSID> <InstanceNumber> Instance is dependent on *SAP <SAPSID> <InstanceNumber> Service*

To check the dependencies double-click the corresponding resource and choose *Dependencies*.

20. If required bring the resources offline and modify the dependencies.

4.3 Installing the Java Central Instance

You can install the Java central instance on MSCS node A or on a host outside of MSCS.

- If you install the central instance on an MSCS node, make sure that the:
  - SAP cluster group and the database cluster group are online and available on Node A.
  - central instance number is **different** from the SCS instance number.
  - SAP cluster group and the database cluster group are online and available on Node A.
- If you install the central instance on a host (application server) outside of MSCS, you have to install the database client software on this host. For more information about installing the client software, see *Installing the MS SQL Server Database Software* in Chapter 2 of the installation guide *SAP Web Application Server 6.40 SR1 Java on Windows: MS SQL Server*, which is available on SAP Service Marketplace at: **`service.sap.com/instguidesNW04`** → *Installation* → *SAP Web AS* → *SAP Web AS 6.40 SR 1 and Related Documentation.*

1. Open a command prompt and change to the relevant directory of the Installation Master DVD:

`<DVD>:\IM<xx>\SAPINST\NT\I386` (32-bit) or

`<DVD>:\IM<xx>\SAPINST\NT\IA64` (64-bit)

2. Enter:

```
sapinst product_ha.catalog
```

3. Choose *SAP NetWeaver '04 Support Release 1* → *Java System* → *MS SQL Server* → *Java Central Instance Installation*.
4. If you are asked to log off, choose *OK*.

   SAPinst logs off automatically.
5. Log on again.

   SAPinst restarts automatically.
6. Choose *Cancel* and stop SAPinst.

   To stop SAPinst, right-click the icon for the SAPinst output window located in the Windows tray and choose *Exit*.
7. Restart SAPinst manually from the command prompt with the previous command:
   `sapinst product_ha.catalog`
8. Choose again *SAP NetWeaver '04 Support Release 1* → *Java System* → *MS SQL Server* → *Java Central Instance Installation*.
9. Follow the instructions in the SAPinst dialogs and enter the required parameter values.

   If you install the central instance on an MSCS node, make sure that on the screen *Java System > SCS Instance you enter the following:*

   - For the SCS instance host, enter the **virtual** SCS host name.
   - For the installation drive, you choose the **local** disk where you want to install the **Java central instance**. Do not enter the shared disk for the SCS instance.
10. Check that the Java central instance is running and you can log on to the Java system.

4.4 Installing an Additional Dialog Instance

You can install the dialog instance on MSCS node B or on a host outside of MSCS.

- If you install the dialog instance on an MSCS node, make sure that:
  - The dialog instance number is **different** from the SCS instance number.
  - For the dialog instance installation drive, you choose a **local** disk. Do **not** choose the shared disk of the SCS instance
- If you install the dialog instance on a host (application server) outside of MSCS, you have to install the database client software on this host. For more information about installing the client software, see *Installing the MS SQL Server Database Software* in Chapter 2 of the installation guide *SAP Web Application Server 6.40 SR1 Java on Windows: MS SQL Server*, which is available on SAP Service Marketplace at: **`service.sap.com/instguidesNW04`** → *Installation* → *SAP Web AS* → *SAP Web AS 6.40 SR 1 and Related Documentation.*

1. Open a command prompt and change to the required directory of the Installation Master DVD:

`<DVD>:\IM<xx>\SAPINST\NT\I386` (32-bit) or

`<DVD>:\IM<xx>\SAPINST\NT\IA64` (64-bit)

2. Enter:

   ```
   sapinst product_ha.catalog
   ```

3. Choose *SAP NetWeaver'04 Support Release 1* → *Java System* → *MS SQL Server* → *Dialog Instance Installation*.
4. If you are asked to log off, choose *OK*.

   SAPinst logs off automatically.

5. Log on again.

   SAPinst restarts automatically.

6. Choose *Cancel* and stop SAPinst.

   To stop SAPinst, right-click the icon for the SAPinst output window located in the Windows tray and choose *Exit*.

7. Restart SAPinst manually from the command prompt with the previous command:
   `sapinst product_ha.catalog`
8. Choose again *SAP NetWeaver'04 Support Release 1* → *Java System* → *MS SQL Server* → *Dialog Instance Installation*.
9. Follow the instructions in the SAPinst dialogs and enter the required parameter values.

   For the Java dialog instance disk, choose a **local** disk.

   For the central instance host enter the **virtual** SCS host name.

4.5 Installing the J2EE License

As in an MSCS environment the SCS instance can run on both nodes in case of hardware failure (failover mechanism), the J2EE license has to be installed on both nodes, as follows:

1. Start the Java application server.
2. Log on to the Java central instance and install the license on the first MSCS node.
3. Start the Visual Administrator with `go.bat` from the directory `usr\sap\<sid>\<instance>\j2ee\admin\`.
4. Choose *Server* → *Services* → *Licensing Adapter*
5. In the *General* tab you find all information about how to get a permanent license for the J2EE Engine.
6. After you have installed the license on the first node, move the SAP SCS cluster group to the second node.
7. Restart the Java application server and install the license on the second node as described above.

4.6 Configuring SAP MMC for MSCS

You can use SAP Microsoft Management Console (MMC) to monitor the status of a clustered SCS instance and any other remote system, view start profiles, development traces, and so on.

You **cannot** use SAP MMC to start or stop a clustered SCS instance. For this purpose you must use the cluster administrator tool. If you try to start or stop a clustered SCS instance with SAP MCC, the cluster software regards this as an error.

You configure SAP MMC on both nodes to include the information from the clustered SCS instance (or any remote instance) as follows:

1. Start SAP MMC by double-clicking the shortcut on the desktop.
2. Choose *Console Root* → *SAP Systems*.
3. Right-click and choose *Properties*.
4. In the *General* tab, check the following settings:
   - *Options* → *Use fix SAP instance list* must be selected
   - *Options* → *Always show local SAP instances* must **not** be selected
5. In the *Fixed* tab, add required instances to the list.
6. Choose *File* → *Save* to save your changes.

5 Additional Information

The following section provides information about:

5.1 Moving MSCS Groups

Use

During various stages of the cluster installation, you have to move the database, or the SAP SCS cluster groups from one node to the other before you can continue.

Prerequisites

The groups you want to move are configured and are visible in the *Cluster Administrator*.

Procedure

1. Start the *Cluster Administrator* with *Start* → *Programs* → *Administrative Tools* → *Cluster Administrator*.
2. In the *Cluster Administrator*, select a group, for example *Disk Group 1,* and drag it to the required node on the left-hand pane.
3. Repeat the previous step for each group that you want to move.

5.2 Rebooting During the Installation for MSCS

Use

You only need to perform this procedure if you have to reboot during the installation for MSCS. A reboot means that resources fail over to the second node. Therefore, after each reboot, you have to return the system to the state it had before the reboot, as described below.

Procedure

1. In the Cluster Administrator, move all resources back to the original node.
2. If you have already clustered the database, bring the database group online.
3. Recreate the `SAPMNT` share for the directory `usr\sap` on the SCS instance drive

If you use Windows Server 2003, you have to reset the permissions for the `SAPMNT` shares from *Read* to *Full Control*, as follows:

i. Right-click on the directory `usr\sap` and choose *Sharing and Security*.

ii. Select *Sharing* and in the *Share Name* field, enter `SAPMNT`.

iii. Under *Permissions*, make sure that the permission for `SAPMNT` is set to *Full Control*.

5.3 Creating and Adding New Groups and Users

Creating Local Groups

The following procedure describes how to create the local group named `SAP_SAP_<SID>_LocalAdmin`.

1. Choose *Start* <→ *Control Panel*> → *Administrative Tools* → *Computer Management*.
2. *Choose Local Users and Groups*.
3. Right-click *Groups* and choose *New Group*.
4. For *Group name*, enter `SAP_<SID>_LocalAdmin` and choose *Add*.

   The window *Select Users, Computers, or Groups*, opens.
5. In the *Object names* field enter:

   `<domain>\SAP_<SID>_GlobalAdmin`
6. Choose *OK*.

   In the Window *New Group* the group is added.
7. Choose *OK.*

Adding a domain group to a local group

With the following procedure you can add all users belonging to the domain group to a local group. In the example, we add the domain group `SAP_<SID>_GlobalAdmin` to the local `Administrators` group.

1. Choose Start <→ Control Panel> → *Administrative Tools* → *Computer Management*.
2. Choose *Local Users and Groups*.
3. Choose *Groups*.
4. In the right panel double-click the *Administrators* group and choose *Add*.
5. In the *Object names* field enter :`<domain>\SAP_<SID>_GlobalAdmin`
6. Choose *OK*.
7. Choose *OK* again.

5.4 Starting and Stopping the Java System in an MSCS Configuration

Use

You use this procedure to start or stop the Java system in an MSCS configuration.

Process Flow

1. You start or stop the SCS instance with the MSCS Management Console.
2. You start or stop the Java application server with the SAP Management Console.

Procedure

1. Start and stop the SCS instance with the MSCS Management Console as follows:

   Starting the SCS Instance

   a. Start the Cluster Administrator by choosing *Start* → *Programs* → *Administrative Tools* → *Cluster Administrator*.

   b. Right-click the SCS cluster group *SAP-<SCS> <SAPSID>* and choose *Bring online*.

      The SCS instance is started.

   Stopping the SCS Instance

   a. Start the Cluster Administrator by choosing *Start* → *Programs* → *Administrative Tools* → *Cluster Administrator*.

   b. Click the SCS cluster group *SAP <SCS> <SAPSID>* to display the resources belonging to the SCS cluster group.

   c. Right-click the resource *SAP <SCS> <SAPSID>* and *choose Take offline*.

      The SCS instance is stopped

2. Start and stop the Java application server with the SAP Management Console.

   Before you start the Java application server, make sure that the SCS instance is running.