Installation Guide

SAP NetWeaver 2004s SR1 Java on Windows: Oracle

Including:

NetWeaver Java Application Server (AS-Java)

NetWeaver Business Intelligence Java Components (BI)

NetWeaver Development Infrastructure (DI)

NetWeaver Enterprise Portal (EP)

Application Sharing Server (Optional Standalone Unit)

Target Audience

- System Administrators
- Technical Consultants

Document version: 1.0 – April 10, 2006

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Documentation in the SAP Service Marketplace

You can find this document at the following address:
`service.sap.com/instguides`

Typographic Conventions

Example	Description
<>	Angle brackets indicate that you replace these words or characters with appropriate entries to make entries in the system, for example, "Enter your **<User Name>**".
®	Arrows separating the parts of a navigation path, for example, menu options
Example	Emphasized words or expressions
Example	Words or characters that you enter in the system exactly as they appear in the documentation
Example	Textual cross-references to a URL, for example, `www.sap.com`
/example	Shortcuts added to the URL of a homepage to enable quick access to specific content on the Web
123456	Hyperlink to an SAP Note, for example, SAP Note 123456
Example	■ Words or characters quoted from the screen. These include field labels, screen titles, pushbutton labels, menu names, and menu options. ■ Cross-references to other documentation or published works
Example	■ Output on the screen following a user action, for example, messages ■ Source code or syntax quoted directly from a program ■ File and directory names and their paths, names of variables and parameters, and names of installation, upgrade, and database tools
EXAMPLE	Technical names of system objects. These include report names, program names, transaction codes, database table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE
EXAMPLE	Keys on the keyboard

Document History

⚠️ Caution

Before you start the implementation, make sure you have the latest version of this document. You can find the latest version in SAP Service Marketplace at the following internet address: `service.sap.com/instguides`.

The following table provides an overview on the most important document changes.

Version	Date	Description
1.00	04/10/2006	Initial Version

Table of Contents

1 Introduction

This documentation explains how to install SAP NetWeaver 2004s SR1 Java. For more information about the technology provided by SAP NetWeaver, see SAP Service Marketplace at: `service.sap.com/netweaver`.

You can install SAP NetWeaver 2004s SR1 Java with the following usage types:

- NetWeaver Application Server Java (AS Java)

  Only valid for: BI Java Components (BI-Java)

- NetWeaver Business Intelligence Java Components (BI Java)

  You also have to install NetWeaver Enterprise Portal (EP).

  End of: BI Java Components (BI-Java)

  Only valid for: Development Infrastructure (DI)

- NetWeaver Development Infrastructure (DI)

  End of: Development Infrastructure (DI)

  Only valid for: Enterprise Portal (EP)

- NetWeaver Enterprise Portal (EP)

  End of: Enterprise Portal (EP)

⚠ Caution

This documentation describes how to install **all** required SAP NetWeaver Usage Types in a **single** installation run.

If you want to add additional software units to an existing SAP system, proceed as described in **SAP Note** 883948.

For more information about the usage types of SAP NetWeaver and their interdependencies, see the documentation *Master Guide – SAP NetWeaver 2004s* on *SAP Service Marketplace* [page 4].

This documentation also explains how to install:

- The **Java Add-In** for an already existing ABAP system
- **Application Sharing Server** as an optional standalone unit

If you want to install Application Sharing Server, start reading this documentation at *Application Sharing Server as an Optional Standalone Unit* [page 21].

> 💡 Note
>
> If you want to **plan** your SAP NetWeaver system landscape, see the documentation *Technical Infrastructure Guide: SAP NetWeaver 2004s*.

Constraints

You need to consider the following constraints before you start your installation:

■ You **must** only use the SAP installation tools according to the instructions and for the purposes described in the SAP installation documentation. Improper use of the SAP installation tools can damage files and systems already installed.

■ SAP system installations should **only** be performed by SAP Technical Consultants, who are certified for your operating system, your database, and the SAP system that you are installing.

■ For downward-compatible releases of DB/OS platforms for SAP products, SAP plans to regularly release the newest database (DB) and operating-system (OS) versions of SAP products. These releases are downward-compatible with earlier SAP system releases.

Be aware that, for already shipped SAP components, we only support the installation for database versions proposed by the installation tool. Therefore, you must install a SAP component or perform a system copy using a downward-compatible database as follows:

● Install the component with the old proposed database version.

● Upgrade the old database version to the downward-compatible new version.

1.1 New Features

Here you can find the new features in this release.

SAP System Installation

Area	Description
SAPinst	As of SAP NetWeaver 2004s SAPinst has the following new features: ■ You can check the prerequisites for the installation of your SAP system with the *Prerequisite Checker* [page 24]. ■ You can uninstall an SAP system or an SAP component with the SAPinst service *Uninstall – System / Standalone Engines / Optional Standalone Unit*. ■ You can install the Java Add-In to an already existing ABAP system. ■ You can change the default names of the Java users `J2EE_ADMIN`, `J2EE_GUEST` and `SAPJSF` during the input phase of the installation. ■ You assign one Master Password to all users created by SAPinst. This password is used for all user accounts and for the secure store key phrase. ■ SAPinst initializes most of the input parameter fields with default values. If required, you can change each default value by choosing to revise the related parameter section in the *Parameter Summary* screen before you start the processing phase of the installation.
Installation DVDs	You start the installation from a single Installation Master DVD, which is the same for all databases.
SAP Solution Manager Key	You require a key to install your SAP system. You *generate this key with your SAP Solution Manager* [page 37].

Oracle Database

Area	Description
New features in Oracle 10g	For the complete list of new features, see further documentation from Oracle, which you can find at: `www.oracle.com/technology/products/database/oracle10g` See also: ■ `www.oracle.com/technology/documentation/database10g.html` ® *View Library* ■ The documentation provided by Oracle on the RDBMS DVD under `<DVD_Drive>:\NT\<platform>\DOC\index.htm`

Operating Systems

Area	Description
Support of Operating Systems	See the Product Availability Matrix (PAM) on SAP Service Marketplace at `service.sap.com/platforms` ® *Product Availability Matrix.*

Documentation

Area	Description
SAP Notes	You can now access SAP Notes directly in SAP Service Marketplace from your PDF. Place the cursor on the SAP Note "<number>" and double-click. A separate browser windows opens and the SAP Note is displayed.
Web Dispatcher Installation	The installation of a Web Dispatcher is covered in a dedicated installation guide, available at `service.sap.com/installnw2004s` ® *Installation – Standalone Engines & Clients* ® *Installation Guide – Web Dispatcher on <platform>*
Application Sharing Server Installation	The installation of Application Sharing Server is part of the SAP NetWeaver Java installation guide, available at `service.sap.com/installnw2004s` ® *Installation – SAP NetWeaver 2004s* ® *Installation Documentation – SAP NetWeaver 2004s SR1* ® *<Database>* ® *<Operating System>* ® *Java*

1.2 SAP Notes for the Installation

You **must** read the following SAP Notes **before** you start the installation. These SAP Notes contain the most recent information on the installation, as well as corrections to the installation documentation.

Make sure that you have the up-to-date version of each SAP Note which you can find in the SAP Service Marketplace at `service.sap.com/notes`.

You can directly access the SAP Notes related to SAP NetWeaver installation at `service.sap.com/sapnotesnw2004s`.

SAP Notes for the Installation

SAP Note Number	Title	Description
919105	SAP NetWeaver 2004s SR1 Installation on Windows	Windows-specific information about the SAP system installation and corrections to this documentation
852008	Release Restrictions for SAP NetWeaver 2004s	Customer information on restrictions concerning the productive usage of certain functions.
919106	SAP NetWeaver 2004s SR1 Installation on Windows: Oracle	Oracle-specific information about the SAP system installation and corrections to this documentation
828268	Oracle 10g : New functions	Information about new Oracle features released for the SAP system.
855498	Installation Prerequisite Checker	SAP Software on UNIX, Windows and iSeries: Checking OS Dependencies

1.3 Information Available on SAP Service Marketplace

More information is available as follows on SAP Service Marketplace.

Documentation

Description	Internet Address	Title
Master Guide for SAP NetWeaver 2004s	service.sap.com/installNW2004s	*Master Guide — SAP NetWeaver 2004s*
List of media for installation or upgrade for SAP NetWeaver 2004s	service.sap.com/installNW2004s	*Media List — SAP NetWeaver 2004s*
Installation of SAP Solution Manager	service.sap.com/solutionmanager ® *Installation Guides ® Release 4.0*	*Installation Guide — SAP Solution Manager 4.0 on <OS>: <Database>*
Configuration of SAP Solution Manager	service.sap.com/solutionmanager ® *Installation Guides ® Release 4.0*	*Configuration Guide — SAP Solution Manager 4.0 on <OS>: <Database>*
Patching of SAP NetWeaver 2004s scenarios	service.sap.com/maintenanceNW2004s	*Support Package Stack Guide — SAP Netweaver 2004s Support Package Stack <current stack>*
Upgrade to SAP NetWeaver 2004s	service.sap.com/upgradeNW2004s	*Component Upgrade Guide — SAP NetWeaver 2004s Application Server ABAP*
Installation of SAP NetWeaver Developer Workplace	service.sap.com/installNW2004s	*Installation Guide — SAP NetWeaver Developer Workplace*
Installation of SAP NetWeaver Developer Studio	service.sap.com/installNW2004s	*Installation Guide — SAP NetWeaver Developer Studio*

Description	Internet Address	Title
Installation of the SAP System Landscape Directory (SLD)	`service.sap.com/installNW2004s` ® *Configuration*	*Post-Installation Guide — System Landscape Directory SAP NetWeaver 2004s*
Installation of Web Dispatcher	`service.sap.com/installNW2004s` ® *Installation - Standalone Engines & Clients*	*Installation Guide — Web Dispatcher on <platform> for SAP NetWeaver 2004s SR1*
Front End installation	`service.sap.com/installNW2004s`	*Front End Installation Guide (this guide is also available on the Presentation DVD)*
Homogeneous and heterogeneous system copy for SAP systems based on NetWeaver 2004s	`service.sap.com/installNW2004s`	*Homogeneous and Heterogeneous System Copy for SAP Systems based on SAP NetWeaver 2004s*
SAP NetWeaver Problem Analysis Guide	`help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Solution Life Cycle Management by Key Capability* ® *SAP NetWeaver Problem Analysis Guide (PAG)*	*SAP NetWeaver Problem Analysis Guide (PAG)*

General Quick Links

Description	Internet Address
SAP Help Portal	`help.sap.com`
SAP NetWeaver Library in SAP Help Portal	`help.sap.com/nw2004s`
SAP Notes	`service.sap.com/notes`
SAP Notes for SAP NetWeaver 2004s installation	`service.sap.com/sapnotesnw2004s`
Released platforms and operating systems	`service.sap.com/platforms`
Unicode SAP systems and their availability	`service.sap.com/unicode`
System sizing (Quick Sizer tool)	`service.sap.com/sizing`
High availability	`service.sap.com/ha`

Security	`service.sap.com/security`
	
	 💡 Note
	 For information on Windows operating system security, see:
	 `www.microsoft.com/security`

Information on SAP Support Package Stacks	`service.sap.com/sp-stacks`
SAP Solution Manager	`service.sap.com/solutionmanager`

1.4 Naming Conventions

In this documentation, the following naming conventions apply:

Terminology

■   *SAP system* refers to *SAP NetWeaver 2004s SR1.*
■   *Java system* refers to *SAP NetWeaver 2004s SR1 Java.*

Variables

Variables	Description
`<SAPSID>`	SAP system ID in uppercase letters
`<sapsid>`	SAP system ID in lowercase letters
`<DBSID>`	Database ID in uppercase letters
`<dbsid>`	Database ID in lowercase letters
`<host_name>`	Name of the corresponding host
`<INSTDIR>`	Installation directory for the SAP system
`<DVD_DIR>`	Directory on which a DVD is mounted
`<OS>`	Operating system name within a path
`<SCHEMA_ID>`	Database schema ID

The following example shows how the variables are used:

Example

Log on as user `<sapsid>adm` and change to the directory `\usr\sap\<SAPSID>`.

If your SAP system ID is C11, log on as user `c11adm` and change to the directory `\usr\sap\C11`.

2 Planning

This section tells you how to plan the installation of your SAP system.

Only valid for: HA (MSCS)

If you want to perform a high-availability installation with **Microsoft Cluster Service (MSCS)**, see *High Availability with Microsoft Cluster Service* [page 119].

End of: HA (MSCS)

You have to complete the following planning activities:

1. You plan your SAP system landscape according to the *Master Guide − SAP NetWeaver 2004s* and the *Technical Infrastructure Guide − SAP NetWeaver 2004s*, both of which are available on SAP Service Marketplace at `service.sap.com/installNW2004s`.
2. You *choose your basic system variants* [page 7].
3. You *plan how to distribute the instances to hosts* [page 9].
4. You *plan your system configuration* [page 10].
5. You *identify basic SAP system parameters* [page 15].
6. If you want to use Adobe Document Services (ADS), you *check what you have to do in case your platform is not supported for ADS* [page 19].
7. You *decide if you want to use Multiple Oracle Homes* [page 19].
8. You make sure that the *SAP Solution Manager* [page 20] is available in your SAP system landscape.

Only valid for: Development Infrastructure (DI)

9. You *decide which Java development scenario* [page 21] to install.

End of: Development Infrastructure (DI)

Only valid for: Enterprise Portal (EP)

10. You *decide if you want to install Application Sharing Server* [page 21].

End of: Enterprise Portal (EP)

The following planning activity is **optional**:

- *Installation of Multiple Components in One Database (MCOD)* [page 89]
- *Preparing User Management for an External ABAP System* [page 94]

2.1 Basic System Variants

This section describes the basic system variants and shows how you can distribute SAP instances within these variants.

Mandatory instances of a Java system are the central instance, the central services instance, and the database instance.

Note

Optionally, you can install one or more dialog instances on a separate dialog instance host.

The following graphics show examples for the distribution of the SAP instances in a central system, where the mandatory instances are installed on one host, and a distributed system, where the mandatory instances are installed on separate hosts.

In addition, you can install one or more dialog instances on a separate dialog instance host.

Figure 1: Java System
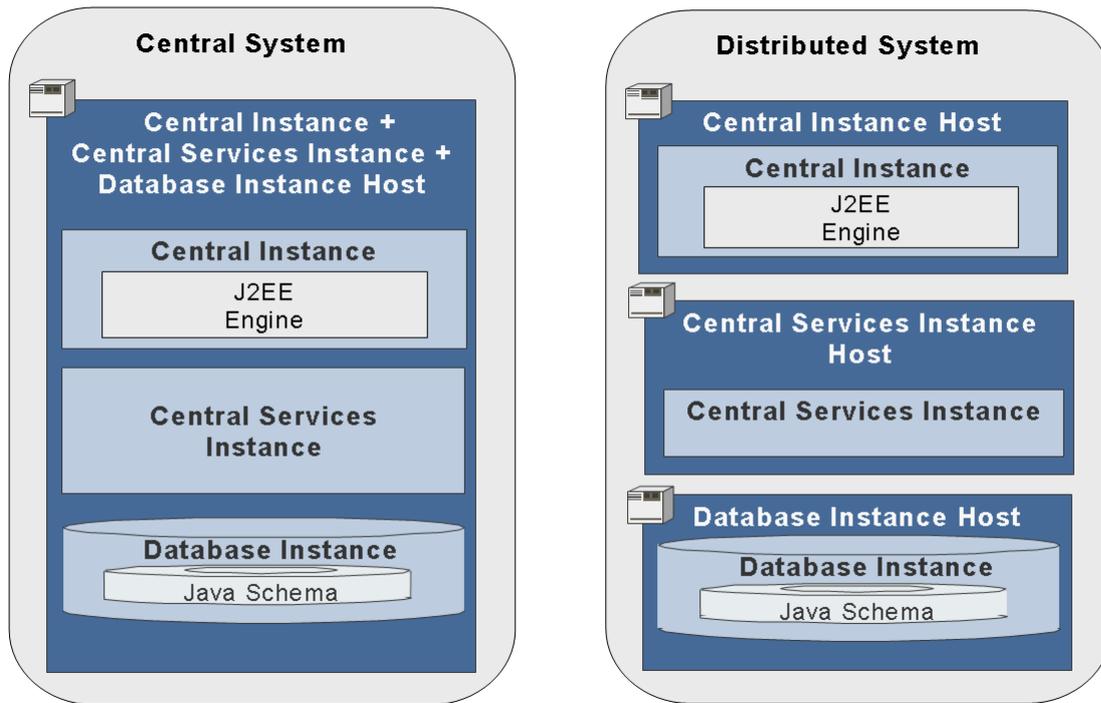
Installing a Java Add-In to an Already Existing ABAP System

This documentation also describes how to install a Java Add-In to an already existing ABAP system. You can then operate **both** the ABAP application server and the J2EE Engine on the SAP system.

Mandatory instances of a Java Add-In for ABAP system are the central instance, the central services instance, and the database instance.

💡 Note

Optionally, you can install one or more dialog instances.

If your ABAP system already uses a dialog instance and you still want to use this dialog instance, you have to deinstall the existing ABAP dialog instance, before you install the new ABAP+Java dialog instance.

The following graphic shows examples for the distribution of the SAP instances in a central system, where the mandatory instances are installed on one host, and a distributed system, where the mandatory instances are installed on separate hosts.

Figure 2: Java Add-In for ABAP System
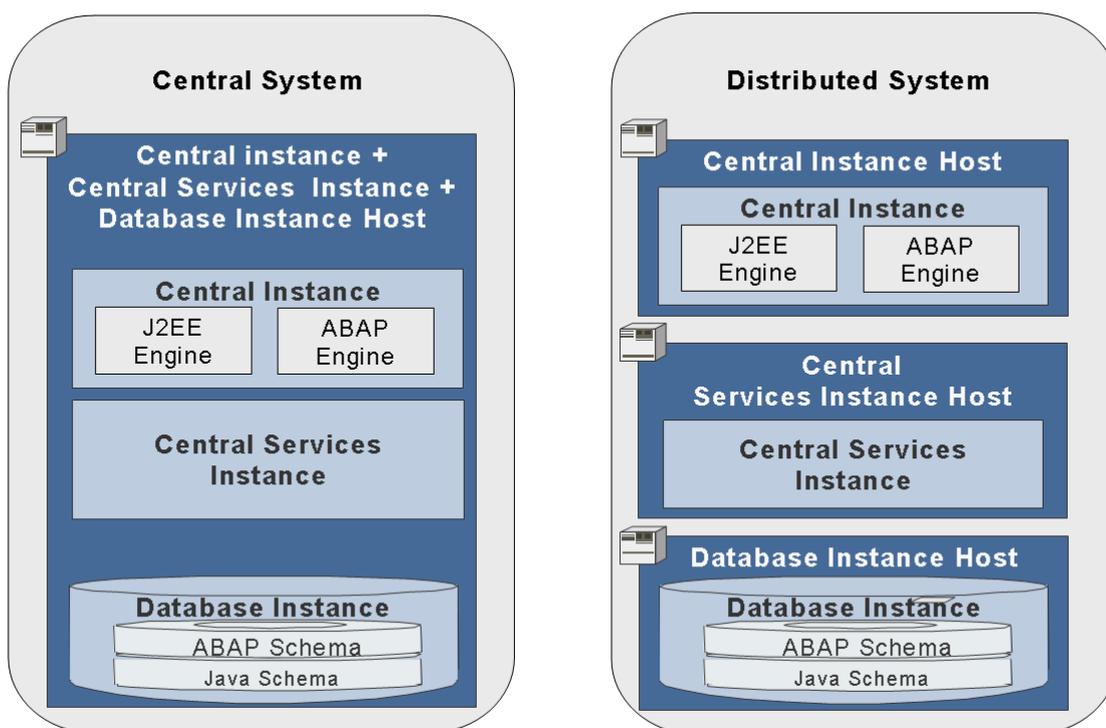
More Information

Only valid for: HA (MSCS)

For more information on how to distribute SAP instances in a high-availability SAP system, see *SAP System Components in an MSCS Configuration* [page].

End of: HA (MSCS)

2.2 How to Distribute Instances to Hosts

The following provides information on how you can distribute the SAP instances for the different SAP system variants. You use SAPinst to install the SAP instances as a:

■ **Central** system on a **single** host

You run SAPinst and install all instances on one host.

■ **Distributed** system on **several** hosts

You perform the following steps:

1. You run SAPinst and install the:
   - Central services instance (SCS) on the global host
   - Database instance on the database host
   - Central instance on the central instance host
   - Dialog instance(s), if required, on the dialog instance host(s)

The following graphic shows how to distribute your instances to several hosts:

Figure 3: Distribution of Instances in a Java System
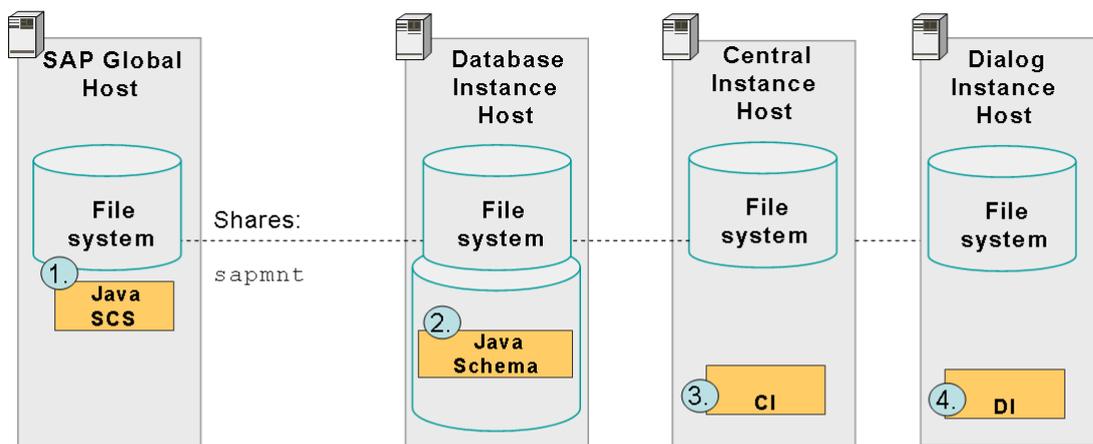
2.3 System Configuration

You need to consider the following aspects:

■ You and your hardware partner *plan the distribution of your SAP system instances within the basic system variants* [page 7].

■ You and your hardware partner work out a high-performance configuration based on sizing information that reflects the system workload, such as:
   - The set of applications to be deployed
   - How intensively the applications are to be used

- The number of users
- Your decide whether to perform a domain or local installation:
  - Local installation

    You need to be `Local Administrator` of the machine involved. In a local installation, all Windows account and user information is stored locally on one host and is not visible to any other hosts in the system.

    If the SAP system is to run on a **single** machine, you can perform a local installation.

    > **Note**
    >
    > If you install a distributed system as a local installation this can lead to authorization problems for the operating system users `<sapsid>adm` and `SAPService<SAPSID>`. Therefore, SAP recommends you to install a distributed system as a **domain** installation.

  - Domain installation

    You need to be `Domain Administrator` of the domain involved, and all machines in the system must belong to the same domain. In a domain installation, the user information is stored centrally on the domain controller and is accessible to all hosts in the system.

    If the system is to be distributed across **more than one** machine, SAP strongly recommends you to perform a domain installation.

    > **Caution**
    >
    > 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.
    >
    > For more information, see *Performing a Domain Installation without being a Domain Administrator* [page 34].

For more information on user rights for a local or domain installation, see: *Granting User Rights for the Installation* [page 32].

2.3.1 Distribution of Components to Disks

When you install the SAP system, the installation tools prompt you to enter drive letters for the main components of the system. This gives you the opportunity to distribute components to disks in the system as you wish. The way in which you do this significantly affects system throughput and data security, and must therefore be carefully planned. The best distribution depends on your specific environment and must take into consideration factors such as the size of the components involved, security requirements and the expected workload.

When you work out the assignment of components to disks, you first need to get an overview of the main components and their corresponding directories. Then, on the basis of sample configurations and the recommendations provided in this documentation, you can decide which assignment is best for your particular system.

SAP systems are normally installed on RAID arrays that ensure data redundancy. This documentation therefore focuses on RAID subsystems and drives.

Minimal Configuration

The following illustrates a disk configuration for a small test or demo system. As security and performance play a less crucial role in this type of system, many different configurations are feasible. The following shows one of the possible options.

⚠ Caution

Use the illustrated configuration exclusively for test or demo systems with a final database size of less than 10 GB. It is unsuitable for production systems because it only minimally satisfies security and performance requirements.

Figure 4:
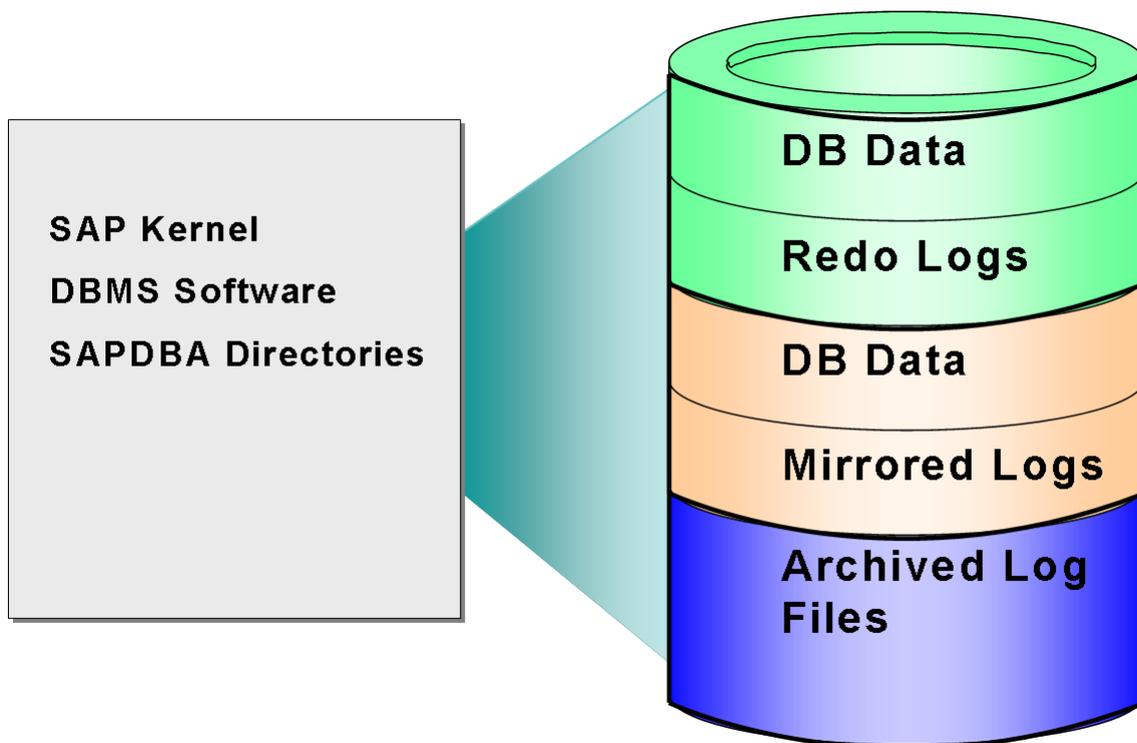
Distribution of Directories to Disks

Disk	Directories
Disk 1	\ORACLE\<DBSID>\102 \ORACLE\<DBSID>\sapreorg \ORACLE\<DBSID>\origlogA \ORACLE\<DBSID>\origlogB \ORACLE\<DBSID>\sapdata1 \ORACLE\<DBSID>\sapdata2

Disk	Directories
Disk 2	\ORACLE\<DBSID>\mirrlogA \ORACLE\<DBSID>\mirrlogB \ORACLE\<DBSID>\saptrace \ORACLE\<DBSID>\sapbackup \ORACLE\<DBSID>\sapcheck \ORACLE\<DBSID>\sapdata3 \ORACLE\<DBSID>\sapdata4
Disk 3	\ORACLE\<DBSID>\saparch

Comments

■ The configuration ensures that no data can be lost, but the process for recovering a damaged database is complicated and time-consuming.
■ The redo logs and database files are located on the same disks. This means that a single disk failure can result in the loss of both the redo logs and database data.
■ The I/O-intensive redo logs are on the same disk volumes as the data files. This can impede performance.
■ An equally good alternative would be to simply place all components on a single RAID 5 array.

2.3.2 SAP Directories

During the SAP system installation, the \usr\sap directory is created on the:

■ Global host and shared with the name sapmnt
  On global hosts, the \usr\sap directory contains
  ● general SAP software
  ● global and local (instance-specific) data.
  All instances of an SAP system access this directory on the global host using the Universal Naming Convention (UNC) path.
■ Local host and shared with the name saploc.
  On local hosts, the \usr\sap directory contains
  ● copies of the SAP software
  ● local (instance-specific) data.
  The executables on the local host are replicated from those on the global host each time the local instance is started.

> 💡 Note
> Since SAP traces for the instance are created in \usr\sap, make sure there is sufficient space available in this directory. Changes in SAP profiles can also affect the disk space.

The following graphic shows how the physical directory \usr\sap is shared on the global host and in a distributed installation. In both cases, the UNC pathes are used as follows:

■ \\<SAPGLOBALHOST>\sapmnt to access global directories

■ `\\<SAPLOCALHOST>\saploc` to access local instance-specific data

Figure 5: Directory Structure on the Global Host in a Java System
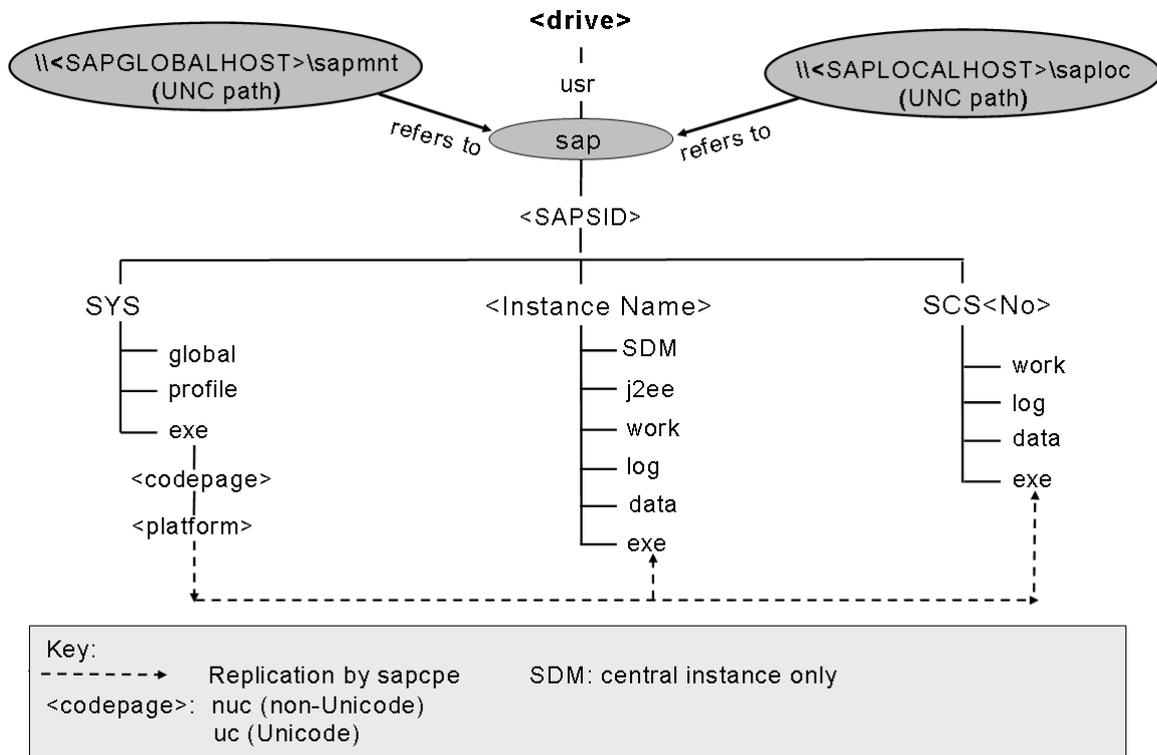
The above graphic shows the directory structure on the global host. The global data (binaries) is stored in the global directories on the global host and physically exists only once for each SAP system. Other application server access the data using the UNC path, `\\<SAPGLOBALHOST>\sapmnt`, where `SAPGLOBALHOST` is replaced by the SAP system with the name of the global host. The global host has the `SAP\<SAPSID>\SYS` directory structure.

   Every time an instance starts, the SAP copy program sapcpe compares the binaries in the `<platform>`-directory on the global host and the binaries in the **exe**-directory on the application server. If the binaries in the **exe** directory are elder than those in the `<platform>`-directory, sapcpe replaces them with the newer version of the global host.

Figure 6: Directory Structure for a Distributed Java System
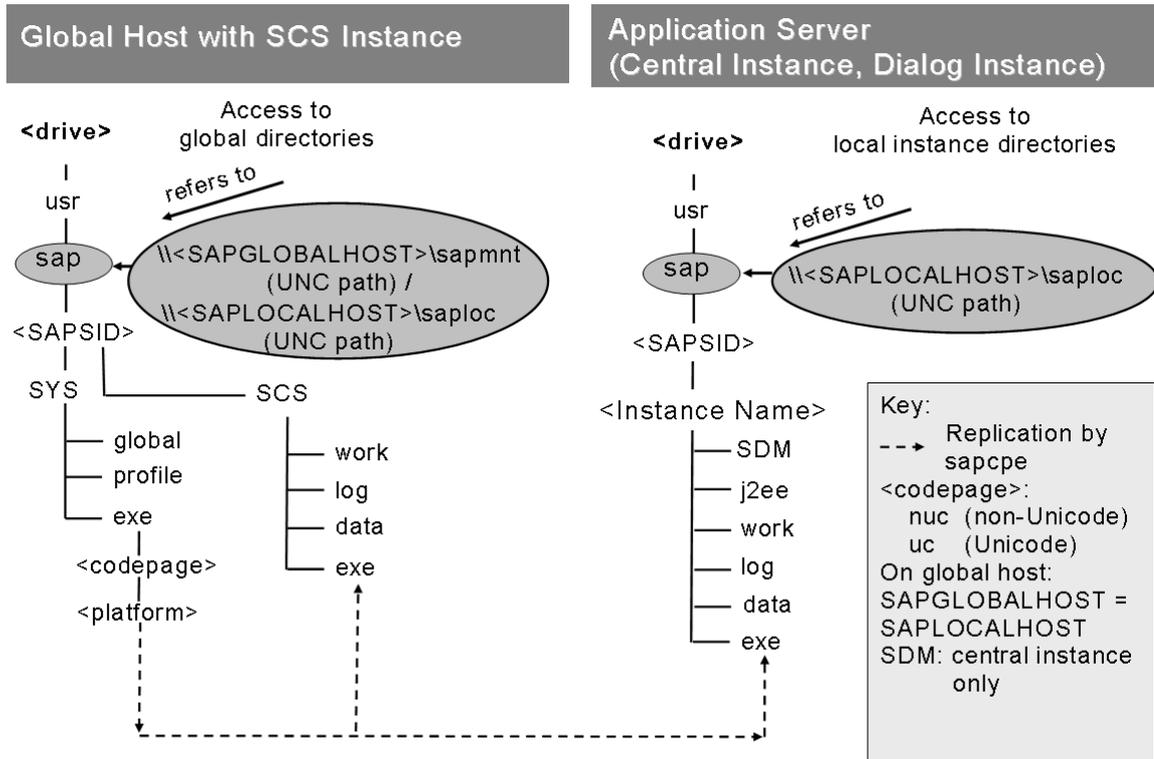
The above graphic shows how the distributed instances, interacts with the global host.

Distributed instances use SAPGLOBALHOST to access global data on the global host

In a distributed system, the parameters SAPGLOBALHOST and SAPLOCALHOST have **different** values.

In a distributed system, the parameters SAPGLOBALHOST and SAPLOCALHOST have the **same** values on the global host with an SCS instance.

2.4 Basic SAP System Parameters

The tables below list the basic system parameters that you need to determine before installing your SAP system. For all other SAP system parameters, use the F1 help in the SAPinst dialogs.

Note

In the column "Enter Your Values", you write down the values that you plan to use, for example, the *Message Port Number.*

SAP System ID and Database ID

Parameters	Description	Enter Your Values

SAP System ID `<SAPSID>`	The SAP System ID `<SAPSID>` identifies the whole SAP system.
	
	Caution
	Choose your SAP system ID carefully. You **cannot** change the SAP system ID after the installation.
	
	Make sure that your SAP system ID:
	■ Is unique throughout your organization
	■ Consists of exactly three alphanumeric characters
	■ Contains only uppercase letters
	■ Has a letter for the first character
	■ Does not include any of the following, which are reserved IDs:
	`ADD ALL AND ANY ASC COM DBA END EPS FOR GID IBM INT`
	`KEY LOG MON NIX NOT OFF OMS RAW ROW SAP SET SGA SHG`
	`SID SQL SYS TMP UID USR VAR`
		...

Database ID `<DBSID>`	The `<DBSID>` identifies the database instance. The database ID `<DBSID>` can be different from the SAP system ID.	...

Parameters Relevant for the System Landscape

Parameters	Description	Enter Your Values
Instance Number	**Instance Number:** Technical identifier for internal processes, consisting of a two-digit number from 00 to 97. The instance number must be unique on a host. That is, if more than one SAP instance is running on the same host, these instances must be assigned different numbers. **Caution** Do **not** use 43, 60, 89 for the instance number because: ■ 43 is used by MSCS ■ 60 is used by iSCSI ■ 89 is used by Windows Terminal Server	...
Name of Instance Host	**Instance Host:** Host name of the specific instance. To find out the host name, open a command prompt and enter `hostname`. For more information about the allowed host name length and characters, see **SAP Note** 849423.	...

Parameters	Description	Enter Your Values
Message Server Port	⚠ Caution Make sure that all message server port numbers on the same host are unique. **Port number of the SAP Message Server:** If you do not specify a value, the default port number is used. The message port number must be unique for the SAP system on all hosts. **Java Message Server Port** The Java message server only uses the **internal** message server port. The Java message server is configured in the SCS instance profile. The internal message server port uses the parameter `rdisp/msserv_internal` with default value 39<nn>, where <nn> is the instance number of the SCS message server instance. For more information about the parameters used for internal and external message server ports, see **SAP Note** 821875.	...
Windows Domain	SAPinst creates the `<sapsid>adm` and `SAPService<SAPSID>` users in the domain specified. Make sure that you have domain administrator rights before you start the installation. If not, you have to create these users manually before starting the installation. For more information, see *Granting User Rights for the Installation* [page 32].	...
Java users	**Administrator Name:** SAPinst sets the user name `J2EE_ADMIN` by default. If required, you can choose another user name according to your requirements. SAPinst sets the following user names by default. ■ For the Java part of an ABAP+Java system: `J2EE_ADMIN` ■ For a Java system: `Administrator`. If required, you can choose other user names. **Communication User Name:** This user is used for the communication between the ABAP and the Java part of an ABAP+Java system. SAPinst sets the user name `SAPJSF` by default. If required, you can choose another user name. **Guest Name:** SAPinst sets the user name `J2EE_GUEST` by default. For users who do not belong to a company or who have registered as company users and are pending approval. Guest users belong to the default group `Authenticated Users`. The user must exist on the central ABAP system that is used for the central user management. If required, you can revise all these default user names at the end of the input phase of the installation using the `Parameter Summary` screen. If the SAP User Management Engine (UME) is configured against the user management of an ABAP system, enter the name of the ABAP user that is defined as administrator for this system.	...

Parameters	Description	Enter Your Values
Master Password	This password is used for all user accounts SAPinst creates and for the secure store key phrase. The length has to be 8–14 characters. Depending on your installation scenario there might be more restrictions.	...

Data required to establish the SAP Enterprise Portal URL	The portal URL consists of the following:
	■ **AS Java system host name**
	   The name of the host on which the J2EE Engine was installed.
	■ **AS Java system port**
	   The port on which the portal is listening.
	   `http://<hostname>:<port>/irj`
	   For more information, see *Establishing the Portal URL* [page 62].
		...

Cryptography Level — Java Cryptography Extension (JCE)	**Cryptography Level:** **Java Cryptography Extension (JCE):** The SAP Java Libraries need the JCE files for strong cryptography. For more information see *Installing the Java Development Kit* [page 38].	...
SAP Solution Manager key	To perform the installation of your SAP system, you need to *generate a SAP Solution Manager key* [page 37], which the installation requires to continue. For more information, see **SAP Note 805390**.	...

Parameters for SAPDATA Drives

Parameters	Description	Enter Your Values
Installation drive	Base directory for the SAP system. Do **not** add `<SAPSID>` as subdirectory because the system adds this directory automatically. Example If you enter `D:`, the system adds the directory `D:\usr\sap\SAPSID`. Note If you install a subsequent SAP system, the `saploc` share already exists and you cannot select the installation drive. SAPinst uses the installation drive where the `saploc` share points to.	...
Oracle parameters	■ Oracle home ■ SAPDATA drives ■ Drives for redolog and archives (`oraarch`)	...

Parameters Relevant for the Database

Parameters	Description	Enter Your Values
Code page	The code page that is used by your database (Unicode or Non-Unicode).	...
Database schemata, Passwords	The Java database schema is named `SAP<SCHEMA_ID>DB`. Default name is `SAPSR3DB`.	...

Oracle Listener Name, Oracle Listener Port	■ If you install the database instance on a host where no other Oracle database is installed, you normally do not have to change the default values for Listener Name and Listener Port.
	■ If you install the database instance on a host where already another Oracle database is installed you have the following options:
	  ● If you install it in the same Oracle home, you use the default values for Listener Name and Listener Port.
	  ● If you install it in a different Oracle home, you specify an unused Listener Name and Listener Port for the new Oracle Listener.
	■ All dialog instances of an SAP system must use the same Listener Port than the database instance.
		...

2.5 Running Adobe Document Services on Non-Supported Platforms

Adobe document services (ADS) are currently not supported to run natively on all platforms supported by SAP systems based on SAP NetWeaver, in particular on 64-bit platforms.

Procedure

To use ADS in SAP landscapes on non-supported platforms, install an additional standalone AS Java on a platform supported by ADS.

For more information, see **SAP Note** 925741.

2.6 Multiple Oracle Homes

Oracle allows to install multiple Oracle Homes on one host.

Only valid for: HA (MSCS)

💡 Note

MSCS only:

Multiple Oracle Homes for different database instances are not supported in an MSCS configuration.

End of: HA (MSCS)

Note the following about multiple Oracle Homes:

■ Multiple Oracle Homes are necessary, if you install different Oracle versions for two or more databases on the same host.

■ If you use multiple Oracle Homes you must use different port numbers for each listener.

■ If you install the same Oracle database version on one host for different database instances, you can use:

● Multiple Oracle Homes

With multiple Oracle Homes you can administer your databases independently. For example, if you want to install a patch set, you do not have to install them on both databases.

● One Oracle Home for two databases

You have to install the database software only once.

> **Note**
>
> In case you later want to use two multiple homes instead of one, you either have to perform a new database instance installation or upgrade your database.

Before you install your Oracle database software, you need to decide whether you want to set up multiple Oracle Homes as this influences the installation procedure. For more information, see *Setting Up Multiple Oracle Homes* [page].

2.7 Using SAP Solution Manager

The SAP Solution Manager is the strategic application management platform for our customers and the collaboration between the customer and SAP. To ensure the availability of this application management platform a SAP Solution Manager system is technically required to perform any upgrade or installation for all SAP Software. During the installation/upgrade process you are prompted to enter the `SAP Solution Manager Key`.

This key is needed to proceed with the installation. Without this key, the installation process cannot continue. You may generate all needed keys for your entire system landscape (development, quality assurance and production system) in **one** SAP Solution Manager System. In case you plan to install several solution landscapes (for example in different countries), one SAP Solution Manager System is still sufficient.

Prerequisites

■ You require at least **SAP Solution Manager 3.2 with Support Package 8** or **SAP Solution Manager 4.0**.

■ If required, you can install SAP Solution Manager:

● You order SAP Solution as described in **SAP Note** 628901.

● You install SAP Solution Manager as described in the documentation *Installation Guide – SAP Solution Manager <3.2 or 4.0> on <OS> : <Database>* on SAP Service Marketplace at:
`service.sap.com/instguides` ® *SAP Components* ® *SAP Solution Manager* ® *Release <3.2 or 4.0>*.

More Information

For more information about SAP Solution Manager, see `service.sap.com/solutionmanager`.

2.8 Usage Type Development Infrastructure

The SAP NetWeaver Development Infrastructure (NWDI) is the environment for all processes in Java-based development and software life-cycle management. You can centrally manage all development phases with the Change Management Service (CMS), from the definition of a central development environment for each software project through to quality management and production. The CMS controls the management of sources in the Design Time Repository (DTR) and archives in the Component Build Service (CBS). The component model adds metadata to Java-based projects, which is the basis for the new development process.

There are the following Java development scenarios with SAP NetWeaver:

■ Scenario "Java Projects with Central Source File Storage": development with central source code version control only
■ Scenario "Developing Components with the NWDI": all services of the Development Infrastructure and the SAP component model are used

Prerequisites

Usage Type DI requires usage type Application Server Java (AS—Java). Optionally, you can also combine it with other usage types in one system.

Features

The installation of the NWDI is pre-configured. It is optimized for the installation on a single host.

More Information

■ You can set the sizing of the Development Infrastructure according to your needs.
  For information on the hardware requirements for the Development Infrastructure, which depends on the size of your development team, see **SAP Note** 737368.
■ For all manual configuration steps, see the *SAP Solution Manager* [page 68].

2.9 Application Sharing Server as an Optional Standalone Unit

Application Sharing Server for real-time collaboration provides data streaming services that enable application sharing capabilities provided by SAP NetWeaver collaboration. The server handles the flow of data between portal users collaborating through the real-time application sharing feature.

Application Sharing Server lets users share their Windows desktop or individual applications with other portal users in real time. Remote users can interact directly with the shared desktop or application as if they were sitting at the host machine.

The server is installed automatically with usage type Enterprise Portal (EP) on the portal host. In a cluster environment, the load generated by the Application Sharing Server is replicated to all instances of the cluster.

This generates load on all dialog instance hosts. You can only use Application Sharing Server with SAP NetWeaver systems running usage type EP.

Planning

For test or demo purposes, you can run the Application Sharing Server on the portal machine.

⬆ Recommendation

For production use, we recommend that you install the server as **an optional standalone unit on a dedicated host**. To do this, you perform a separate installation procedure, as described in this documentation. By removing Application Sharing Server traffic from the portal host, you reduce the networking and J2EE Engine demands on that machine, which improves the overall performance of the portal.

When you install usage type EP, the Application Sharing Server is installed automatically. If you do not intend to use the Application Sharing Server, you can disable it. For more information, see *Post-Installation Tasks for Application Sharing Server* [page 80].

You can install Application Sharing Server on a dedicated host before or after installing the usage type EP. However, you can only complete the post-installation steps after you have installed usage type EP.

To install Application Sharing Server on a dedicated host, proceed as described in the following sections:

Preparation

Prepare the Application Sharing Server installation host for an **AS Java central system** installation:

1. *Check hardware and software requirements* [page 23]
2. *Check the Windows file system* [page 31]
3. *Install the Java Development Kit* [page 38]
4. *Prepare the installation DVDs* [page 39]

Installation Process

1. *Install the Oracle database software* [page 43]
2. Run SAPinst to *install Application Sharing Server as an optional standalone unit* [page 58]

Post-Installation

Perform the post-installation steps for an **AS Java central system** installation on the Application Sharing Server installation host:

1. *Start and stop the Application Sharing Server system* [page 60].
2. *Check the SAP Java documentation* [page 65].
3. *Apply the latest kernel and support packages* [page 66].
4. Perform *post-installation steps for Adobe Document Services* [page 69].
5. Perform *Post-Installation Tasks for Application Sharing Server* [page 80].
6. Ensure the security of *Java standalone users stored in the database* [page 81].

| End of: Enterprise Portal (EP)

3 Preparation

You have to complete the following preparations:

1. You *check the hardware and software requirements* [page 23] using the Prerequisites Checker.
2. You *check for the Windows file system* [page 31].
3. You *check the Windows domain structure* [page 31].
4. If required, you *reduce the size of the file cache* [page 32].
5. If required, you *grant user rights for the installation* [page 32].
6. If required, you *perform a domain installation without being a domain administrator* [page 34].
7. You *install the SAP front-end software* [page 36].
8. You *install the Java Development Kit* [page 38].
9. You *prepare the installation DVDs* [page 39].
10. If required, you *download the installation DVDs from SAP Service Marketplace* [page 40]

The following preparation activity is **optional** and **only** applies, if you want to *prepare user management for an external ABAP system* [page 94].

3.1 Hardware and Software Requirements

■ You check the hardware and software requirements for your operating system (OS) and the SAP instances using the **Prerequisite Checker** tool.
   The *Prerequisite Checker* provides information about the requirements that you need to meet before you start the installation. For example, it checks the requirements for the different installation services.

> **Note**
> The values that are checked by the *Prerequisite Checker* apply for the installation of **development systems** or **quality assurance systems**.

> **Note**
> Always check **SAP Note** 855498 for the most recent updates to the Prerequisite Checker.

You can run the *Prerequisite Checker* as follows:
● **Standalone (optional):**
   To check the hardware and software requirements of the host on which you want to later install an SAP system, you can *run the Prerequisite Checker standalone* [page 24].
● **Integrated in SAPinst (mandatory):**
   SAPinst automatically runs the Prerequisite Checker when you install your SAP system.

- In addition, we recommend that you consult the requirements checklists tables, which provide values for the installation of **development systems** or **quality assurance systems**. Depending on the amount of data involved, the requirements might change.
- To get precise sizing values for **production systems**, you have to do one of the following:
  - You use the *SAP Quick Sizer* tool that is available on SAP Service Marketplace at `service.sap.com/sizing`. You enter information about your planned system and the tool calculates the requirements.
    For more information, see *Planning your System Landscape* in the *Master Guide – SAP NetWeaver 2004s*, which is available on *SAP Service Marketplace* [page 4].
  - You contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing.
- For supported operating system and Java (JDK/JRE) releases, see the *Product Availability Matrix* on SAP Service Marketplace at `service.sap.com/pam`.
- Contact your OS vendor for the latest OS patches.
- Make sure that the host name meets the requirements listed in **SAP Notes** 611361 and 849423.

Process Flow

1. If required, you *run the Prerequisite Checker standalone* [page 24] to check the hardware and software requirements.
2. In addition, we recommend that you check the hardware and software requirements checklists for the following system variants:
   - *Central System* [page 25]
   - *Distributed System* [page 26]

⚠ Caution

If you do not fully meet the above requirements, you might experience problems when working with the SAP system.

3.1.1 Running the Prerequisite Checker in Standalone Mode (Optional)

Before installing your SAP system, you can run the *Prerequisite Checker* in standalone mode to check the hardware and software requirements for your operating system (OS) and the SAP instances.

⬆ Recommendation

We recommend that you use **both** the *Prerequisite Checker* and the requirements tables for reference.

💡 Note

When installing your SAP system, SAPinst automatically starts the *Prerequisite Checker* and checks the hardware and software requirements in the background.

Procedure

1. You *start SAPinst* [page 46].
2. On the *Welcome* screen, choose *<SAP System>* ® *Additional Software Lifecycle Tasks* ® *Additional Preparation Tasks* ® *Prerequisites Check*.
3. Enter the required parameters when prompted in the SAPinst dialogs.

> **Note**
>
> For more information about each parameter, position the cursor on the parameter field and choose `F1` in SAPinst.

When you have finished, the *Start Execution* screen appears summarizing all parameters you have entered. To change a parameter, choose *Back* and enter a new value.

4. To start the *Prerequisite Checker* choose *Start*.

Result

After the check has successfully completed, the *Prerequisite Check Results* screen appears displaying the results found.

If required, you can also check the results in file `prerequisite_checker_results.html`, which you can find in the installation directory.

3.1.2 Requirements Checklist for a Central System

If you want to install a central system, where all instances reside on one host, this host must meet the following requirements:

Requirement Type	Requirement

Hardware	◼ Suitable backup system
	◼ Minimum disk space:
	  ● Database Software:
	    1 GB (x86, AMD64)
	    2 GB (IA64)
	  ● SAP system files (not including paging file):
	    5 GB (x86, AMD64)
	    8 GB (IA64)
	  ● SAP database files (not including paging file):
	    2 GB
	  ● 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk
	To check disk space:
	
	1. Choose *Start* ® *Programs* ® *Administrative Tools* ® *Computer Management* ® *Disk Management*.
	
	2. Select the local drive.
	
	3. Choose *Properties*.
	◼ Minimum RAM:
	  1.5 GB
	  To check RAM, in the Windows Explorer choose *Help* ® *About Windows*.

Requirement Type	Requirement
	⚠️ Caution During the installation with SAPinst, make sure not to enter a value larger than the maximum Java heap size of your platform. For more information, see the corresponding documentation of your Java Development Kit - JDK. ◾ Paging File Size: 1 times RAM plus 8 GB For 64-bit systems, also see **SAP Note** 153641. If you want to install only a small system, contact your hardware partner for appropriate swap space values. To check paging file size: 1. Right-click *My Computer* and choose *Properties*. 2. Choose *Advanced* ® *Performance Settings*. 3. If required, in section *Virtual Memory*, choose *Change*.
Software	◾ Oracle 10g database server software ◾ Current Oracle patch set and hot fix, if available. 💡 Note For more information on the current patch set, see **SAP Note** 871735. ◾ English international version of one of the following: ● Windows Server 2003 Standard Edition ● Windows Server 2003 Enterprise Edition ● Windows Server 2003 Datacenter Edition 💡 Note We **strongly** recommend you to use the 64-bit version of the Windows Server 2003 editions. To check your Windows version: 1. Choose *Start* ® *All Programs* ® *Accessories* ® *Command Prompt*. 2. Enter the command `winver`. ◾ Make sure that the required fonts or code pages are installed. ◾ Make sure that NLS and corresponding saplocales are installed. ◾ A suitable Windows Resource Kit is strongly recommended.

3.1.3 Requirements Checklist for a Distributed System

The following sections provide information about the hardware and software requirements in a distributed system, where the following SAP instances can reside on different hosts:

◾ *Central services instance* [page 27]
◾ *Database instance* [page 27]
◾ *Central instance* [page 28]
◾ *Dialog instance* [page 30]

Note

The listed values only apply for **development systems** or **quality assurance systems**.

Note

If you install multiple SAP instances on one host, you need to add up the requirements.

3.1.3.1 Requirements Checklist for the Central Services Instance

The central services instance (SCS) host must meet the following requirements:

Requirement Type	Requirement
Hardware	■ Suitable backup system ■ Minimum disk space: 　● Central Services Instance (SCS) (not including paging file): 　　5 GB (x86, AMD64) 　　8 GB (IA64) 　● 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. 　To check disk space: 　1. Choose *Start* ® *All Programs* ® *Administrative Tools* ® *Computer Management* ® *Disk Management*. 　2. Right-click the local drive and choose *Properties*. ■ Minimum RAM: 0.5 GB 　To check RAM, in the Windows Explorer choose *Help* ® *About Windows*. ■ Paging File Size: 　1 times RAM plus 8 GB 　To check paging file size: 　1. Right-click *My Computer* and choose *Properties*. 　2. Choose *Advanced* ® *Performance Settings*. 　3. If required, in section *Virtual Memory*, choose *Change*.
Software	■ English international version of one of the following: 　● Windows Server 2003 Standard Edition 　● Windows Server 2003 Enterprise Edition 　● Windows Server 2003 Datacenter Edition 　To check the Windows version: 　1. Choose *Start* ® *All Programs* ® *Accessories* ® *Command Prompt*. 　2. Enter the command `winver`. ■ A suitable Windows Resource Kit is strongly recommended.

3.1.3.2 Requirements Checklist for the Database Instance

The database instance host must meet the following requirements:

Requirement Type	Requirement
Hardware	■ Suitable backup system ■ Minimum disk space: ● Oracle database software: 1 GB (x86, AMD 64) 2 GB (IA64) ● Database instance (not including paging file): 2 GB ● 4.3 GB of temporary disk space for every required installation DVD you have to copy to a local hard disk. To check disk space: 1. Choose *Start* ® *All Programs* ® *Administrative Tools* ® *Computer Management* ® *Storage* ® *Disk Management*. 2. Right-click the local drive and choose *Properties*. ■ Minimum RAM: 0.5 GB To check RAM, in the Windows Explorer choose *Help* ® *About Windows*. ■ Paging file size: 1.5 times RAM (recommended by Microsoft) To check: 1. Right-click *My Computer* and choose *Properties*. 2. Choose *Advanced* ® *Performance Settings*. 3. If required, in section *Virtual Memory*, choose *Change*.
Software	■ Oracle 10g database server software ■ Current Oracle patch set and hot fix, if available. 💡 Note For more information on the current patch set, see **SAP Note** 871735. ■ English international version of one of the following: ● Windows Server 2003, Standard Edition ● Windows Server 2003, Enterprise Edition ● Windows Server 2003, Datacenter Edition 💡 Note We **strongly** recommend you to use the 64-bit version of the Windows Server 2003 editions. To check the Windows version: 1. Choose *Start* ® *All Programs* ® *Accessories* ® *Command Prompt*. 2. Enter the command `winver`. ■ Make sure that the required fonts or code pages are installed. ■ Make sure that NLS and corresponding saplocales are installed. ■ A suitable Windows Resource Kit is strongly recommended.

3.1.3.3 Requirements Checklist for the Central Instance

The central instance host must meet the following requirements:

Requirement Type	Requirement

Hardware	■ Suitable backup system
	■ Minimum disk space:
	  ● Central Instance (CI) (not including paging file):
	    5 GB (x86, AMD64)
	    8 GB (IA64)
	    In addition you require 4 GB (x86, AMD64), or 8 GB (IA64) per additional platform.
	  ● 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk
	  To check disk space:
	  1. Choose *Start* ® *All Programs* ® *Administrative Tools* ® *Computer Management* ® *Disk Management*.
	  2. Select the local drive.
	  3. Choose *Properties*.
	■ Minimum RAM:
	  0.5 GB
	  To check RAM, in the Windows Explorer choose *Help* ® *About Windows*.
	
	  ⚠ Caution
	  During the installation with SAPinst, make sure not to enter a value larger than the maximum Java heap size of your platform. For more information, see the corresponding documentation of your Java Development Kit - JDK.
	
	■ Paging File Size:
	  1 times RAM plus 8 GB
	  For 64-bit systems, also see **SAP Note** 153641. If you want to install only a small system, contact your hardware partner for appropriate swap space values.
	  To check paging file size:
	  1. Right-click *My Computer* and choose *Properties*.
	  2. Choose *Advanced* ® *Performance Settings*.
	  3. If required, in section *Virtual Memory*, choose *Change*.

Software	■ English international version of one of the following:
	  ● Windows Server 2003 Standard Edition
	  ● Windows Server 2003 Enterprise Edition
	  ● Windows Server 2003 Datacenter Edition
	
	  💡 Note
	  We **strongly** recommend you to use the 64-bit version of the Windows Server 2003 editions.
	
	  To check your Windows version:
	  1. Choose *Start* ® *All Programs* ® *Accessories* ® *Command Prompt*.

Requirement Type	Requirement
	2. Enter the command `winver`. ■ Make sure that the required fonts or code pages are installed. ■ Make sure that NLS and corresponding saplocales are installed. ■ A suitable Windows Resource Kit is strongly recommended.

3.1.3.4 Requirements Checklist for the Dialog Instance

The dialog instance host must meet the following requirements:

Requirement Type	Requirement
Hardware	■ Suitable backup system ■ Minimum disk space: 　● Dialog Instance (not including paging file): 　　2.5 GB (x86, AMD 64) 　　5 GB (IA64) 　● 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. To check disk space: 1. Choose *Start* ® *All Programs* ® *Administrative Tools* ® *Computer Management* ® *Disk Management*. 2. Right-click the local drive and choose *Properties*. ■ Minimum RAM: 0.5 GB To check RAM, in the Windows Explorer choose *Help* ® *About Windows*. ⚠ Caution During the installation with SAPinst, make sure that you do not enter a value larger than the maximum Java heap size of your platform. For more information, see the documentation for your Java Development Kit (JDK). ■ Paging File Size: 1 times RAM plus 8 GB For 64-bit systems, also see **SAP Note** 153641. If you want to install only a small system, contact your hardware partner for appropriate swap space values. To check paging file size: 1. Right-click *My Computer* and choose *Properties*. 2. Choose *Advanced* ® *Performance Settings*. 3. If required, in section *Virtual Memory*, choose *Change*.
Software	■ English international version of one of the following: 　● Windows Server 2003 Standard Edition 　● Windows Server 2003 Enterprise Edition

Requirement Type	Requirement
	● Windows Server 2003 Datacenter Edition 💡 Note We **strongly** recommend to use the 64-bit version of the Windows Server 2003 editions. To check the Windows version: 1. Choose *Start* ® *All Programs* ® *Accessories* ® *Command Prompt*. 2. Enter the command `winver` ■ A suitable Windows Resource Kit is strongly recommended

3.2 Checking for the Windows File System

You need to check that you are using the Windows File System (NTFS) on hosts where you want to install the SAP system and database. NTFS supports full Windows security and long file names.

💡 Note
You must use NTFS for an SAP system installation. Do not install the SAP directories on a FAT partition.

Procedure

1. Open the Windows Explorer.
2. Select the root directory.
3. Choose *File* ® *Properties* ® *General*.
4. The system displays the type of file system in use.
5. Check that the file system is NTFS.

3.3 Checking the Windows Domain Structure

💡 Note
You do **not** need this step for a local installation.

In Windows, you can implement either of the following domain models for the SAP system:

■ Extra domain
In this model, the SAP system is embedded in its own domain, which is specially defined for SAP. A second domain exists for the user accounts.
In Windows, the SAP domain and user domain must be incorporated in a domain tree. In this tree, the user accounts must form the root domain and the SAP domain must be a child domain of this.
■ Single domain
In this model, the SAP system and the user accounts are included in a single domain.

Prerequisites

■ You are performing a domain installation.
■ You are familiar with checking Windows domain structures. For more information, see the Windows documentation.

> ⚠ Caution
>
> You cannot create local users and groups on the host that is used as domain controller. Therefore, we do **not** support running an SAP instance (including the database instance) on the host where the DNS service is installed.

Procedure

For a domain installation, we recommend that you check that all SAP system and database hosts are members of a single Windows domain. We recommend this for all SAP system setups.

3.4 Reducing the Size of the File Cache

The Windows file cache directly competes with SAP programs for memory. Therefore, you should adjust the file cache as described below.

Procedure

1. Choose *Start* ® *Control Panel* ® *Network Connections* ® *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*.
4. Select *Maximize data throughput for network applications*.

> ⚠ Caution
>
> 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.

5. To confirm your entries, choose *OK*.

3.5 Granting User Rights for the Installation

You have to grant the required rights and privileges that authorize you to install the SAPinst tool and the SAP system.

> ⚠ Caution
>
> If you attempt the installation without the required authorization, the system aborts.

If necessary, you have to ask the system administrator to grant you the necessary authorization **before** you start the installation.

Prerequisites

■ The authorization required depends on whether you intend to perform a domain or local installation. For more information, see *System Configuration* [page 10].

■ A domain installation requires a domain controller to store user and account information centrally for the whole system.

> ⚠ Caution
> ● For performance and security reasons, make sure that you do **not** run an SAP instance (including the database instance) on the host where the domain controller is running.
> SAP does not support an SAP system installation on a domain controller.
> ● Do not use the user `<sapsid>adm` for the installation of the SAP system.

Local Installation

1. Check that you have `Local Administrators` rights for the central instance host.
   In a local installation, all Windows account and user information is stored locally on one host and is not visible to any other hosts in the system.
2. If required, obtain these rights by asking the system administrator to enter you as a member of the `Local Administrators` group.

Domain Installation

> 💡 Note
> SAP recommends to perform a domain installation.

1. Check that you have `Domain Administrators` rights.
   In a domain installation, the user information is stored centrally on the domain controller and is accessible to all hosts in the system.
2. If required, obtain these rights by asking the system administrator to enter you as a member of the `Domain Administrators` group.

Note

If 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.

For more information, see *Performing a Domain Installation without being a Domain Administrator* [page 34].

Only valid for: HA (MSCS)

Note

If you use an MSCS configuration, you always have to perform a domain installation.

End of: HA (MSCS)

3.6 Performing a Domain Installation Without Being a Domain Administrator

If you are not granted domain administrator rights, you can perform the installation as a domain user who is a member of the `Local Administrators` group. In this case, the domain administrator must prepare the system for you appropriately, as described in this section.

Note

You normally perform a domain installation of the SAP system as a user with domain administrators rights, as described in *Granting User Rights for the Installation* [page 32].

The domain administrator has to:

1. Create the new global group `SAP_<SAPSID>_GlobalAdmin`.
2. Create the two new SAP system users `<sapsid>adm` and `SAPService<SAPSID>`.
3. Add the users `<sapsid>adm` and `SAPService<SAPSID>` to the newly created group `SAP_<SAPSID>_GlobalAdmin`.

Prerequisites

You must perform this procedure as a domain administrator.

Creating the New Global Group SAP_<SAPSID>_GlobalAdmin

1. Log on as domain administrator.
2. To start the *Active Directory Users and Computers Console*, choose:
    Start ® *Programs* ® *Administrative Tools* ® *Active Directory Users and Computers*

> **Note**
>
> If you cannot find *Active Directory Users and Computers*, start it as follows:
>
> a) Choose *Start* ® *Run* and enter `mmc`.
>
> b) Choose *Console* ® *Add/Remove Snap-in...* ® *Add*.
>
> c) Select *Active Directory Users and Computers*.
>
> d) Choose *Add*.
>
> e) Choose *Close* ® *OK*.

3. Right-click *Users* in *Tree*, and choose *New* ® *Group*.

4. Enter the following:

    Group name: `SAP_<SAPSID>_GlobalAdmin`

    > **Note**
    >
    > Enter the `SAP_<SAPSID>_GlobalAdmin` group exactly as specified in the correct uppercase and lowercase.

5. Select the following:

    a) *Group scope:* Global

    b) *Group type*: Security

6. Choose *OK*.

Creating the New SAP System Users <sapsid>adm and SAPService<SAPSID>

1. In *Active Directory Users and Computers Console*, right-click *Users* in *Tree* and choose:

    New ® *User*

2. Enter the following:

    > **Note**
    >
    > Enter the `<sapsid>adm` and `SAPService<SAPSID>` user exactly as specified in the correct uppercase and lowercase.

Field	Input for <sapsid>adm	Input for SAPService<SAPSID>
First name:	None	None
Initials:	None	None
Last name:	None	None
Full name:	<sapsid>adm	SAPService<SAPSID>
User logon name:	<sapsid>adm	SAPService<SAPSID>

3. Choose *Next* and enter the following:

    Password: `<password>`

    Confirm password: `<password>`

4. Select *Password never expires*

> **Note**
> Make sure that no other options are selected.

5. Choose *Next* ® *Finish*.

Adding the <sapsid>adm User to the SAP_<SAPSID>_GlobalAdmin Group

1. In the *Users* folder, double-click the newly created user account `<sapsid>adm` in the list on the right.
2. Choose *Member* ® *Add*.
3. Select the new *SAP_<SAPSID>_GlobalAdmin* group and choose *Add* to add it to the list.

> **Note**
> By default, the user is also a member of the `Domain Users` group.

4. Choose *OK* twice.

Adding the SAPService<SAPSID> User to the SAP_<SAPSID>_GlobalAdmin Group

1. In the *Users* folder, double-click the newly created user account *SAPService<SAPSID>* in the list on the right.
2. Choose *Member* ® *Add* .
3. Select the new *SAP_<SAPSID>_GlobalAdmin* group.
4. Choose *Add* to add it to the list.
5. Choose *OK*.

> **Caution**
> The `SAPService<SAPSID>` user must **not** be a member of the `Domain Users` group.
> To remove this group from the *Member of* list:
> a) Select the *SAP_<SAPSID>_GlobalAdmin* group.
> b) Choose *Set Primary Group*.
> c) Select the `Domain Users` group.
> d) Choose *Remove* to delete it from the *Member of* list.

6. Choose *OK* to close *SAPService<SAPSID> Properties*.
7. Close the *Active Directory Users and Computers Management Console*.

3.7 Installing the SAP Front-End Software

For the installation, make sure that the front-end software is installed on at least **one** host machine in your system environment. To simplify the administration of your SAP system, we recommend you install the software on the central instance host.

With the SAP front-end installation software, SAPSetup, you can optimize the deployment of SAP GUI to thousands of clients. You can easily tailor installation packages to match your requirements, distribute patches, and set up automatic update processes for your clients.

For more information on installing the front-end software, see the documentation on SAP Service Marketplace at `service.sap.com/installNW2004s`:

■ *SAP Front End Installation Guide* (English version)
■ *SAP Frontend-Installationsleitfaden* (German version)

3.8 Generating the SAP Solution Manager Key

You need to generate the Solution Manager key because SAPinst prompts for it during the input phase of the installation.

Prerequisites

■ You require at least **SAP Solution Manager 3.2 SP 8** or **SAP Solution Manager 4.0**.
■ If required, you can install SAP Solution Manager:
   ● You order SAP Solution Manager as described in **SAP Note** 628901.
   ● You install SAP Solution Manager as described in the documentation *Installation Guide – SAP Solution Manager <3.2 or 4.0> on <OS> : <Database>* on SAP Service Marketplace at:
   `service.sap.com/instguides` ® *SAP Components* ® *SAP Solution Manager* ® *Release <3.2 or 4.0>*

Procedure

1. In your SAP Solution Manager system, call transaction SMSY (System Landscape Maintenance).
2. To create your SAP system in the system landscape, proceed as follows:
   a) Select the landscape component *Systems* and choose *Create New System* from the context menu.
   b) Enter the system ID in the following dialog box as the system.
   c) Select the relevant product and the corresponding product version from the input help.
      Then choose *Save*.
   d) Fill in the system data as much as possible.
      You can find further documentation in the online help at *Help* ® *Application Help*.
   e) Save your entries.
3. To generate the key, choose *Other object...* from the menu *System Landscape*.
4. Set the indicator *System* and choose the system that you want to install from the input help.
   If you created the system in the SAP Solution Manager in the previous step, choose this system.
5. Choose *Generate Installation / Upgrade Key*.
6. Enter the requested information.
7. Choose *Generate Key*.

Result

The system displays the key. Enter this key during the input phase of the installation

More Information

For more information, see also **SAP Notes** 805390 and 811923.

3.9 Installing the Java Development Kit

You need to prepare the system for the J2EE Engine by installing the Java Development Kit (JDK).

As of SAP NetWeaver 2004s you must install the J2EE Engine with strong encryption.

The JDK includes the Java Runtime Environment (JRE), which is required both for SAPinst and the SAPinst GUI.

The J2EE Engine requires a Java Development Kit (Java™ 2 SDK, Standard Edition = JDK) on every host where the J2EE Engine is to be installed. You need this for the *system variants* [page 7] with Java.

> **Note**
>
> If required, you can perform a **remote** installation using a standalone SAPinst GUI on a separate Windows or UNIX host. This lets you perform the installation on a remote host, controlling it with the SAPinst GUI from a local host.
>
> If you want to perform a remote installation, see *Starting SAPinst on the Remote Host* [page 55]. In this case, you need at least a JRE on the local host to start the SAPinst GUI there.

Procedure

1. Check the JDK versions that are released for SAP systems in the Product Availability Matrix (PAM):
   a) Go to `service.sap.com/pam`.
   b) On the right-hand panel, choose *SAP NetWeaver* ® *SAP NetWeaver 2004s* ® *JSE Platforms*.
   c) Choose tab strip *JSE Platforms*.
   For additional information on the recommended JDK version, see **SAP Note** 709140.

2. Make sure a valid JDK version is installed on every host on which you want to install an SAP instance with the J2EE Engine, as follows:
   - If JDK is not already installed
     Since JDK is not part of the SAP shipment, you need to download and install it.
   - If JDK is already installed
     Check the installed version of JDK by entering the following command:

     `java –version`

   > **Note**
   >
   > SAPinst checks environment variable `SAPINST_JRE_HOME` for a valid Java runtime environment.
   > If `SAPINST_JRE_HOME` is not found, SAPinst also checks `JAVA_HOME`.

3. As of SAP NetWeaver 2004s strong encryption is mandatory for the J2EE Engine and for all usage types that are deployed on it. You need to obtain the JCE policy files beforehand so that they can be installed by SAPinst:
   a) Download the JCE policy files for your platform at `http://java.sun.com/j2se/1.4.2/downloads`.
   b) SAPinst installs the JCE policy files during the installation process.

3.10 Preparing the Installation DVDs

You use this procedure to prepare the installation DVDs. Normally you obtain the installation DVDs as part of the installation package that you receive from SAP. However, you can also *download the installation DVDs from SAP Service Marketplace* [page 40].

⬆ Recommendation

　　We recommend that you make all required DVDs available **in parallel**.

💡 Note

　　If you copy the installation DVDs to disk, make sure that the paths to the location of the copied DVDs do not contain any blanks.

Procedure

1. Identify the required DVDs for your installation as listed below and keep them separate from the remaining DVDs. This helps you to avoid mixing up DVDs during the installation.

    ⚠ Caution

    　　The media names listed below are **abbreviated**.

    　　You can find the **full names** of all media shipped with SAP NetWeaver 2004s SR1 in the document *Media List – SAP NetWeaver 2004s SR1* on SAP Service Marketplace at `service.sap.com/installNW2004s` ® *Installation*.

    💡 Note

    　　You can find the Software Component Archives (SCAs) for the installation of SAP NetWeaver usage types on the NetWeaver Java DVD.

    Only valid for: BI Java Components (BI-Java)

    💡 Note

    　　Do **not** use the Business Intelligence Content Add-On DVD for the installation of BI with SAPinst. You have to install the BI Content Add-On later. For more information, see *Configuring BI Java Information Broadcasting* [page 107].

    End of: BI Java Components (BI-Java)

    The following table shows the required DVDs for the installation of an SAP system based on the usage type **AS Java**:

SAP Instance Installation	Required DVDs
Central services instance, central instance, dialog instance	■ Installation Master DVD ■ NetWeaver Java DVD ■ RDBMS Client DVD ■ Kernel DVD
Database instance	■ Installation Master DVD ■ NetWeaver Java DVD ■ RDBMS DVD ■ RDBMS Patch DVD

The following table shows the required DVDs for the installation of an **Java Add-In** for an already existing ABAP System:

SAP Instance Installation	Required DVD
Central instance, central services instance, dialog instance	■ Installation Master DVD ■ NetWeaver Java DVD ■ Kernel DVD
Database schema	■ Installation Master DVD ■ NetWeaver Java DVD ■ Kernel DVD

2. Use one of the following methods to make DVDs available in parallel:
   ■ Before the installation:
     ● Have sufficient DVD drives
     ● Copy DVDs manually to local hard disks
   ■ During the installation:
     Use the SAPinst DVD / CD Browser dialog. You can check the entered location and then copy the entire DVD to the path you entered in the *Copy Package to* column.

3.11 Downloading Installation DVDs from SAP Service Marketplace (Optional)

You normally obtain the installation DVDs as part of the installation package from SAP.

However, you can also download installation DVDs from SAP Service Marketplace at:

service.sap.com/swdc ® *Downloads* ® *Installations and Upgrades* ® *Entry by Application Group* ® *<your solution>* ® *<release of your solution>* ® *<your operating system>* ® *<your database>*.

If you download installation DVDs, keep in mind that DVDs might be split into several files. In this case, you have to reassemble the required files after the download.

Prerequisites

Make sure that you use the latest SAPCAR version for extracting the downloaded SAR files.

SAPCAR has been made downward-compatible for all releases. Due to this change, older versions of SAPCAR can no longer unpack the current SAR files. To unpack the archives, you need at least SAPCAR 700

or SAPCAR 640 with patch level 4 or higher. For the latest SAPCAR version, see SAP Service Marketplace at `service.sap.com/swdc`.

For more information, see **SAP Note** 212876.

Procedure

1. Create a download directory on the host on which you want to run SAPinst.
2. Identify all download objects that belong to one installation DVD according to one or both of the following:
    - Material number
      All download objects that are part of an installation DVD have the same material number and an individual sequence number:
      `<material_number>_<sequence_number>`

      > Example
      > 51031387_1
      > 51031387_2
      > ...

    - Title
      All objects that are part of an installation DVD have the same title, such as `<solution><DVD_name><OS>` or `<database>RDBMS<OS>` for RDBMS DVDs.
3. Download the objects to the download directory.
4. Extract the individual download objects using SAPCAR, starting with the lowest sequence number – for example 51031387_1, then 51031387_2, and so on.
    During the download SAPCAR sets up the structure of the installation DVD.

    > Note
    > SAPCAR asks if you want to replace existing files, for example `LABELIDX.ASC`. Always accept with `Yes`.

4 Installation

This section provides information about how to perform a **standard** installation of your SAP system.

Only valid for: HA (MSCS)

If you want to perform a **Microsoft Cluster Service (MSCS)** installation, see section *High Availability with Microsoft Cluster Service.*

End of: HA (MSCS)

You have completed the planning and preparation activities, before you start the installation.

Process Flow

You perform the following steps:

1. You *install the Oracle database software* [page 43].
2. If required, you *set up multiple Oracle Homes* [page 45].
3. You *install the SAP system using SAPinst* [page 45].

   Only valid for: Enterprise Portal (EP)
4. If required, you *install the Application Sharing Server as a Standalone Engine* [page 58].

   End of: Enterprise Portal (EP)

4.1 Installing the Oracle Database Software

This section describes how to install the Oracle 10g database server software on the database host.

💡 Note

■ As of Oracle 10g there is no need to manually install the Oracle client software on the application server, as SAPinst automatically installs the client software in the DIR_CT_RUN directory .

■ For supplementary information about Oracle 10g , see the documentation provided by Oracle on the RDBMS DVD under `<DVD_Drive>:\NT\<platform>\DOC\index.htm`

Only valid for: HA (MSCS)

⚠ Caution

You have to install the Oracle server software on both nodes.

End of: HA (MSCS)

Procedure

1. On the database server, start the Oracle Universal Installer as follows:

Place the Oracle in the DVD drive and change to the directory: `<DVD_DRIVE>:\NT\<platform>`

2. Double-click the file `sapserver.cmd`.

3. In the dos-box, specify the drive letter of the local disk where you want to install the Oracle software, and the `<DBSID>`.

> 💡 Note
>
> The dos-box only appears if you perform a new installation (or under a different user), or if `<Oracle_Home>` and `<DBSID>` are not set.

4. In the *Oracle Universal Installer*, enter the information as shown in the following table:

Window	Entry
Specify File Locations	If this screen appears, do the following: ■ Under *Source*: For *Path*: Shows the path to the Oracle source software. Do **not** change the path. ■ Under *Destination*: ● For *Name*: Enter the name of the new `<Oracle_Home>` directory. We recommend that you use the name `<SAPSID><ORACLE_VERSION>`, for example, `C12101` ● For *Path*: Enter the path of a **new** `<Oracle_Home>` directory. We recommend that you use the path: `<DRIVE>:\ORACLE\<DBSID>\<ORACLE_VERSION>`, for example, `C:\ORACLE\C12\101` 💡 Note Do **not** specify an already existing `<Oracle_Home>` directory. You must specify a new directory. Choose *Next*.
Summary	Choose *Install*.
Oracle Net Configuration Assistant: Welcome	If this dialog appears, select *Perform typical configuration*.
Configuration Assistants	💡 Note If you get an error message, choose *OK*. Ignore the following *Warning* screen and choose *OK*. Choose *Next*.
End of Installation	Choose *Exit* to close the Oracle Universal Installer.

5. Install the latest patch set and hot fix (if available) as described in **SAP Note** 871735.

> 💡 Note
>
> Check **SAP Note** 839182, if you require an interim patch and the respective Perl version for the Oracle database installation.

Only valid for: HA (MSCS)

> 💡 Note
>
> You have to install the current Oracle patch set and hot fix (if available) on both nodes.

End of: HA (MSCS)

4.2 Setting Up Multiple Homes (Optional)

This section only applies, if you want to use *multiple Oracle Homes* [page 19].

Procedure

1. Remove all parts referring to `<Oracle_Home>\bin` from the system environment variable `PATH`:
   a) Start the Oracle Universal Installer with *Start* ® *Programs* ® *Oracle - <Home_Name>* ® *Oracle Installation Products* ® *Universal Installer*.
   b) In the *Welcome* screen, choose *Installed Products*.
   c) In the *Inventory* screen, choose the *Environment* tab.
   d) Deselect all components and choose *Apply*.
2. Update or create, if not available, the user environment variable `PATH` of the user who performs the installation with SAPinst:
   a) Choose *My Computer* ® *Properties* ® *Advanced* ® *Environment Variables*.
   b) Under *User variable for <user>* modify or create, if not available, the value `PATH` to include the `<Oracle_Home>\bin`, which you want to use for the installation.

   > 💡 Note
   >
   > You also have to modify the user environment variable `PATH` for all other users using the Oracle software.

4.3 Installing an SAP System Using SAPinst

The following sections provide the steps that you have to perform to install the various instances of an SAP system, or a standalone engine:

- *Running SAPinst on Windows* [page 46]
- *Installing a Java Add-In for an Already Existing ABAP System with SAPinst* [page 51]
- *Using SAPinst GUI* [page 53]
- *Interrupted Installation with SAPinst* [page 54]
- *Starting SAPinst on the Remote Host (Optional)* [page 55]
- *Starting SAPinst GUI Separately (Optional)* [page 56].

4.3.1 Running SAPinst on Windows

This procedure tells you how to install an SAP system with SAPinst. SAPinst includes a SAPinst GUI and a GUI server, which both use Java.

   This section describes an installation where SAPinst, SAPinst GUI, and the GUI server are running on the same host. If required, you can instead perform a *remote installation with SAPinst* [page 55], where SAPinst GUI is running on a **separate** host from SAPinst and the GUI server.

   Note the following information about SAPinst:

■ When you start SAPinst, SAPinst GUI and the GUI server also start. SAPinst GUI connects to the GUI server with a secure SSL connection, and the GUI server connects to SAPinst.

■ SAPinst normally creates the installation directory `sapinst_instdir`, where it keeps its log files, and which is located directly in the `Program Files` directory. If SAPinst is not able to create `sapinst_instdir` there, it tries to create `sapinst_instdir` in the directory defined by the environment variable `TEMP`.

   ↑ Recommendation

   We recommend that you keep all installation directories until the system is completely and correctly installed.

■ SAPinst creates a subdirectory for each installation service called `<sapinst_instdir>\<installation_service>`, which is located in `%ProgramFiles%\sapinst_instdir`.

■ The SAPinst Self-Extractor extracts the executables to a temporary directory (`TEMP`, `TMP`, `TMPDIR`, or `SystemRoot`). These executables are deleted after SAPinst has stopped running.

   Directories called `sapinst_exe.xxxxxx.xxxx` sometimes remain in the temporary directory. You can safely delete them.

   The temporary directory also contains the SAPinst Self-Extractor log file `dev_selfex.out`, which might be useful if an error occurs.

   ⚠ Caution

   If SAPinst cannot find a temporary directory, the installation terminates with the error `FCO-00058`.

■ If you want to terminate SAPinst and the SAPinst Self-Extractor, choose one of the following options:
   ● Right-click the icon for the SAPinst output window located in the Windows tray and choose *Exit*.
   ● Click the icon for the SAPinst output window located in the Windows tray and choose *File* ⑱ *Exit*.

Prerequisites

■ You are logged on as a user with the required rights and privileges to install the SAPinst tool and the SAP system. For more information, see *Granting User Rights for the Installation* [page 32].

■ You need at least 130 MB of free space in the installation directory for each Java installation service. In addition, you need 60-200 MB free space for the SAPinst executables.

■ If you are installing a second or subsequent SAP system into an existing database, make sure that the database is **up and running before** starting the installation. For more information, see *Installation of Multiple Components in One Database* [page 89].

■ **Dialog instance only:** If your SAP System has been upgraded from an earlier release, and you want to install a dialog instance, make sure that the parameter DIR_CT_RUN has identical values in the instance

profile and the start profile of the central instance. If it is set in the instance profile, it must be also set in the
start profile. If it is not set in the instance profile, it must not be set in the start profile.

Procedure

1. Insert the *SAP Installation Master DVD* into your DVD drive or mount it locally.
2. Start SAPinst from the SAP Installation Master DVD by double-clicking `sapinst.exe` from the following
   path:
   `<DVD drive>:\IM_WINDOWS_<platform>`
   SAPinst GUI starts automatically by displaying the *Welcome* screen.
   However, if there is only one component to install, SAPinst directly displays the first input dialog without
   presenting the *Welcome* screen.

   > 💡 Note
   > ■ During the installation, the default ports 21200 and 21212 are used for communication between
   >   SAPinst, GUI server, and SAPinst GUI. SAPinst uses port 21200 to communicate with the GUI server.
   >   The GUI server uses port 21212 to communicate with SAPinst GUI. You get an error message if one
   >   of these ports is already in use by another service.
   >   In this case, open a command prompt and change to the required directory as follows:
   >   **`<DVD drive>:\IM_WINDOWS_<platform>`**.
   >   Enter the following command in a single line:
   >   **`sapinst.exe SAPINST_DIALOG_PORT=<free_port_number_sapinst_gui_to_gui_server>`**
   >   **`GUISERVER_DIALOG_PORT=<free_port_number_gui_server_to_sapinst_gui>`**
   > ■ For a list of all available SAPinst properties, enter the following command:
   >   **`sapinst –p`**.

3. In the *Welcome* screen, choose one of the following installation services:
   ■ SAP Systems
   ■ Additional Software Life-Cycle Tasks
   The following tables provide more information about these installation services:
   ■ **SAP Systems**
     You use this service to install a SAP system with usage types or software units by choosing *<SAP
     system>* ® *SAP Systems* ® *<Database>* ® *<System Variant>* ® *Based on <technical stack>*.
     You can install the following systems variants:
     ● Central System
     ● Distributed System

     Only valid for: HA (MSCS)

     ● High-Availability System

     End of: HA (MSCS)

     The following tables provide an overview of the installation services available for these system variants:

Note
- Choose the corresponding installation services from the tree structure **exactly** in the order they appear for each system variant.
- If you want to use *active directory* [page 93], you must run the installation service *Active Directory Configuration* **before** you start the installation of the SAP system (see table *Additional Software Life-Cycle Tasks* below).
- If you want to use global accounts, which are configured on separate hosts, you must run the installation service *Operating System Users and Groups* **before** you start the installation of the SAP system (see table *Additional Software Life-Cycle Tasks* below).
- If required, install a dialog instance for a central or distributed system by choosing the installation service *<SAP System>* ® *Additional Software Life-Cycle Tasks* ® *Application Server* ® *Dialog Instance*.

Installation Services for a Central System

Installation Service	Remarks
Central System Installation	Installs a complete SAP system including the following instances on one host: ● Central services instance (SCS) ● Database instance ● Central instance **Note** You require at least usage type AS Java or AS ABAP. You can choose the usage types or software units on the next screen.

Installation Services for a Distributed System

Installation Services	Remarks
Central Services Instance (SCS)	Mandatory step in installing a distributed SAP system with usage types or software units based on *AS Java*. Installs a central services instance (SCS) and prepares the SAP global host.
Database Instance	Mandatory step in installing a distributed SAP system. Installs a database instance. You must have finished the *Central Services Instance (SCS)* installation, before you can choose this installation service.
Central Instance	Mandatory step in installing a distributed SAP system on several hosts. Installs a central instance and enables additional usage types or software units. You must have finished the database instance installation.

Installation Services for a High Availability System

Installation Services	Remarks
Central Services Instance (SCS)	Installs a central services instance (SCS).
First MSCS Node	This step performs the following on the first Microsoft Cluster Service (MSCS) node: ● Creates the SAP cluster group ● Adds the SCS instance to the SAP cluster group.
Database Instance	Installs a database instance.
Additional MSCS Node	This step configures an additional Microsoft Cluster Service (MSCS) node to run the SAP cluster group. You must have completed the configuration of the first MSCS node and the database instance installation.
Enqueue Replication Server	Installs an enqueue replication server, which contains a replica of the lock table (replication server).
Central Instance	Installs a central instance and enables additional usage types or software units.
Dialog Instance	Installs a dialog instance. Note You require at least one dialog instance in a high-availability system configured with MSCS.

■ **Additional Software Life-Cycle Tasks**
You use this service to perform the following tasks or to install the following components:

Installation Service	Remarks
Additional Preparation Tasks	With these preparation tasks you can: ● *Configure Active Directory* [page 93] Caution Perform this task **before** you start the installation of your SAP system. ● Use global accounts that are configured on a separate host Caution Perform this task **before** you start the installation of your SAP system. ● Check your hardware and software requirements **before** you start the installation Otherwise, SAPinst automatically checks the hardware and software requirements during the installation with the *Prerequisite Checker*. If any changes are necessary to the SAP system or

Installation Service	Remarks
	operating system settings, SAPinst automatically prompts you. For more information, see *Running the Prerequisites Checker in Standalone Mode* [page 24].
Application Server	Choose *Application Server* ® *<Database>* ® *Dialog Instance* to install one or more dialog instance(s) in an already installed SAP system, if required.
Java Add-In for ABAP	Choose this service to install usage types based on AS Java to an already installed SAP ABAP system. For more information, see *Installing a Java Add-In for an Already Existing ABAP System with SAPinst* [page 51]. For more information, see the chapter *Installing a Java Add-In for an Already Existing ABAP System with SAPinst* which you find in the *SAP NetWeaver 2004s SR1 Java Installation Guide*.
System Copy	Choose this service to perform a system copy. For more information, see the system copy guide, which is available at SAP Service Marketplace at: `service.sap.com/instguidesnw2004s` ® *Installation*
Uninstall	Choose this service to uninstall your SAP system, standalone engines, or optional standalone units. For more information, see *Deleting an SAP System* [page 108].

4. If SAPinst prompts you to log off from your system, log off and log on again.
    SAPinst restarts automatically.
5. Follow the instructions in the SAPinst dialogs and enter the required parameters.

> 💡 Note
>
> For more information about the input parameters, position the cursor in the field of the respective parameter and press `F1`.

Only valid for: Enterprise Portal (EP)

> 💡 Note
>
> During the last restart of the J2EE Engine performed by SAPinst, the portal starts the processing and upload of the new portal archives. It usually takes 15 to 90 minutes before the deployment is completed and the portal is launched.
> Do **not** stop SAPinst or the J2EE Engine during this phase.

End of: Enterprise Portal (EP)

After you have entered all required input information, SAPinst starts the installation and displays the progress of the installation. If the installation was successful, the screen *Finished installation successfully* is displayed.

6. We recommend you to delete all files in the directory `%userprofile%\.sdtgui\`.

More Information

Troubleshooting with SAPinst [page 117].

4.3.2 Installing a Java Add-In for an Already Existing ABAP System with SAPinst (Optional)

This section only applies if you want to install a Java Add-In for an already existing ABAP system.

You can install a Java Add-In for ABAP with the following system variants:

- Central system
- Distributed system

  | Only valid for: HA (MSCS);HA (UNIX) |

- High-availability system

  | End of: HA (MSCS);HA (UNIX) |

Prerequisites

The ABAP system is based on SAP NetWeaver 2004s SR1, which you have set up in the following ways:

- You have installed an ABAP system based on SAP NetWeaver 2004s SR1 as described in the documentation *Installation Guide — SAP NetWeaver 2004s SR1 ABAP on <OS>: <database>*.
- You have upgraded an ABAP system based on SAP Web AS 6.20 or SAP Web AS 6.40 to an ABAP system based on SAP NetWeaver 2004s SR1.

  For more information, see the documentation *Upgrade Master Guide — SAP NetWeaver 2004s* on SAP Service Marketplace at `service.sap.com/upgradeNW2004s`.

Make sure that the parameter `compatible` is set to `10.2.0` in the file `init<dbsid>.ora`.

| Only valid for: HA (MSCS) |

If you use Microsoft Cluster Service (MSCS), stop the ASCS instance in the Cluster Administrator (service `SAP <SID> <instance_number> Service`) before you run the installation service *First MSCS Node* in SAPinst.

| End of: HA (MSCS) |

Procedure

1. *Start SAPinst* [page 46].
2. On the *Welcome Screen*, choose *<SAP system>* ® *Additional Software Life-Cycle Tasks* ® *Java Add-In for ABAP* ® *<database>* ® *<System Variant>*.
3. Choose the corresponding installation services from the tree structure **exactly** in the order they appear for each system variant, as shown in the following tables:

Installation Services for a Java Add-In for ABAP – Central or Distributed System

Installation Services	Remarks
Central Services Instance (SCS) Java Add-In	Installs a central services instance (SCS) and adds usage types or software units based on AS Java

Installation Services	Remarks
Database Instance Java Add-In	Installs the Java schema in the database of your ABAP system
Central Instance Java Add-In	Adds usage types or software units based on AS Java

> **Note**
> If required, you can install an ABAP+Java dialog instance for a central or distributed system by choosing
> *<SAP System>* ® *Additional Software Life-Cycle Tasks* ® *Application Server* ® *Dialog Instance*. Before you use
> this service, deinstall the old ABAP dialog instance.

Installation Services for a Java Add-In for ABAP – High-Availability System

Installation Services	Remarks
Central Services Instance (SCS) Java Add-In	Installs a central services instance (SCS) and adds usage types or software units based on AS Java ⚠ **Caution** You must install it on the same shared disk as the ASCS instance.
First MSCS Node	Configures the SCS instance for the first MSCS node 💡 **Note** Make sure that you choose instance type *ASCS and SCS instance (ABAP and Java)*.
Database Instance Java Add-In	Installs the Java schema in the database of your ABAP system 💡 **Note** If your database instance is to be installed in the **same** MSCS cluster as the SCS and ASCS instance, you must perform this step on the first node of this MSCS cluster. If your database instance is to be installed in a **different** MSCS cluster from the ASCS and SCS instance, you perform this step on another MSCS cluster.
Additional MSCS Node	⚠ **Caution** Choose this step only if you use Microsoft Cluster Services (MSCS). This step configures the SCS instance for the additional MSCS node. 💡 **Note** Make sure that you choose instance type *ASCS and SCS instance (ABAP and Java)*.

Installation Services	Remarks
Enqueue Replication Server	Installs an enqueue replication server, which contains a replica of the lock table (replication table). You must perform this step on all MSCS nodes where the Java central services (SCS) instance or ABAP central services (ASCS) instance is installed and clustered.
Central Instance Java Add-In	Adds usage types or software units based on AS Java
Dialog Instance	Installs a dialog instance in a high-availability system

4. Follow the instructions in the SAPinst input dialogs and enter the required parameters.

> **Note**
> ■ SAPinst prompts you for the **production** client of your ABAP system. This is where you install the Java Add-In.
> ■ For more information about the input parameters, position the cursor in the parameter field and press $\boxed{\text{F1}}$.

After you have entered all required input parameters, SAPinst starts the installation and displays the progress of the installation.

4.3.3 Using SAPinst GUI

The following table shows the most important functions that are available in SAPinst GUI:

SAPinst GUI Functions

Button / Function Key / Menu Entries	Description
F1	Displays detailed information about each input parameter.
Exit	Cancels the installation with the following options: ■ *Stop* Stops the installation without further changing the installation files. You can restart SAPinst to continue the installation later from this point. ■ *Continue* Continues the installation.

Button / Function Key / Menu Entries	Description
Log off	Stops the SAPinst GUI, but SAPinst and the GUI server continue running. 💡 Note If for some reason you need to log off during the installation from the host where you control the installation with SAPinst GUI, the installation continues while you are logged off. You can later reconnect to the same SAPinst installation from the same or another host. For more information, see *Starting SAPinst GUI Separately* [page 56].
Retry	Performs the installation step again (if an error has occurred).
Stop	Stops the installation without further changing the installation files. You can continue the installation later from this point.
Continue	Continues with the option you have chosen before.

4.3.4 Interrupted Installation with SAPinst

The SAP system installation might be interrupted for one of the following reasons:

■ An error occurred during the dialog or processing phase:
SAPinst does not abort the installation in error situations. If an error occurs, the installation pauses and a dialog box appears. The dialog box contains a short description about the choices listed in the table below as well as a path to a log file that contains detailed information about the error.

■ You interrupted the installation by choosing *Exit* in the SAPinst menu.

The following table describes the options in the dialog box:

Option	Definition
Retry	SAPinst retries the installation from the point of failure without repeating any of the previous steps. This is possible because SAPinst records the installation progress in the `keydb.xml` file. We recommend that you view the entries in the log files, try to solve the problem and then choose *Retry*. If the same or a different error occurs again, SAPinst displays the same dialog box again.
Stop	SAPinst stops the installation, closing the dialog box, the SAPinst GUI, and the GUI server. SAPinst records the installation progress in the `keydb.xml` file. Therefore, you can continue the installation from the point of failure without repeating any of the previous steps. See the procedure below.
Continue	SAPinst continues the installation from the current point.

Procedure

This procedure describes the steps to restart an installation, which you stopped by choosing *Stop*, or to continue an interrupted installation after an error situation.

1. Log on to your remote host as a user who is a member of the local administrators group.
2. Insert the Installation Master DVD in your DVD drive.
3. Enter the following commands at the Windows command prompt:

   `cd <DVD drive>:\IM_WINDOWS<platform>`

   `sapinst.exe`

4. From the tree structure in the *Welcome* screen, select the installation service that you want to continue and choose *Next*.

   > **Note**
   > If there is only one component to install, the *Welcome* screen does not appear.

   The *What do you want to do?* screen appears.

5. In the *What do you want to do?* screen, decide between the following alternatives and confirm with *OK*.

Alternative	Behavior
Run a new Installation	SAPinst does not continue the interrupted installation. Instead, it moves the content of the old installation directory and all installation-specific files to the backup directory. Afterwards, you can no longer continue the old installation. For the backup directory, the following naming convention is used: `<log_day_month_year_hours_minutes_seconds>` (for example, `log_01_Oct_2003_13_47_56`).
Continue old installation	SAPinst continues the interrupted installation from the point of failure.

4.3.5 Starting SAPinst on the Remote Host (Optional)

You use this procedure to install your SAP system on a **remote** host. In this case, SAPinst and the GUI server run on the remote host, and SAPinst GUI runs on the local host. The local host is the host from which you control the installation with SAPinst GUI.

Prerequisites

- You have *installed the Java Development Kit* [page 38].
- Both computers are in the same network and can "ping" each other.
  To test this:
  - Log on to your remote host and enter the command `ping <local host>`.
  - Log on to the local host and enter the command `ping <remote host>`.

Procedure

1. Log on to your remote host as a user who is a member of the local administrators group.
2. Insert the Installation Master DVD in the DVD drive on your remote host.

3. Enter the following commands:

   cd <DVD drive>:\IM_WINDOWS_<platform>

   sapinst.exe –nogui

   For more information, see *Running SAPinst on Windows* [page 46].

   SAPinst now starts and waits for the connection to the SAPinst GUI. You see the following at the command prompt:

   ```
   guiengine:  no GUI connected; waiting for a connection on host <host_name>, port
   <port_number> to continue with the installation
   ```

4. Start SAPinst GUI on your **local** host, as described in *Starting SAPinst GUI Separately* [page 56].

4.3.6 Starting SAPinst GUI Separately (Optional)

You use this procedure to start SAPinst GUI separately. You might need to start SAPinst GUI separately in the following cases:

- You have logged off from SAPinst.

  If you logged off during the installation and you later want to reconnect to the installation while it is still running, you can start SAPinst GUI separately.

- You want to *perform a remote installation* [page 55].

  If SAPinst GUI runs on a **different** host from SAPinst and the GUI server, you have to start SAPinst GUI separately.

Prerequisites

You have *installed the Java Development Kit* [page 38] on the host on which you want to start SAPinst without SAPinst GUI.

Starting SAPinst GUI on a Windows Platform

1. Log on as a member of the local administrators group.
2. Insert the SAP Installation Master DVD into your DVD drive.
3. To change to the relevant directory enter the following command:

   cd <DVD drive>:\IM_WINDOWS<platform>

4. Start SAPinst GUI in one of the following ways:

   - If SAPinst GUI runs on the same host as SAPinst and the GUI server, enter the following command:

     startinstgui.bat

     SAPinst GUI uses the local host as default.

   - If SAPinst and the GUI server runs on a different host from SAPinst GUI (remote installation), enter the following command:

     startinstgui.bat -host <host_name>

     <host_name> is the host name of the installation host.

Note
- If you enter the command without additional parameters, SAPinst GUI uses the local host as default. SAPinst GUI starts and tries to connect to the GUI server and SAPinst. As SAPinst and the GUI server are running on another host, SAPinst GUI cannot connect and the *SAP Installation GUI Connection* dialog appears.
  In this case, enter the name of the host on which SAPinst is running and choose *Log on*.
  The first dialog of the installation appears and you can perform the remote installation from your local host.
- For a list of options to start SAPinst GUI, change to the same directory as your SAPinst executable and enter the command `startinstgui.bat –h`.

Starting SAPinst GUI on a UNIX Platform

1. Log on as user `root`.

   ⚠ Caution
   Make sure that the root user has not set any environment variables for a different SAP system or database.

2. Mount your installation DVD.

   Note
   Mount the DVD locally. We do **not** recommend that you use Network File System (NFS).

3. To change to the mount directory enter the following command:
   `cd <Installation_Master_DVD>/IM_<OS>`

4. Start the SAPinst GUI in one of the following ways:
   - If SAPinst GUI runs on the same host as SAPinst and the GUI server, enter the following command **without** additional parameters:
     `./startInstGui.sh`
     SAPinst GUI uses as default the local host.
   - If SAPinst and the GUI server run on a different host from SAPinst GUI (remote installation), enter the following command **with** additional parameters:
     `./startInstGui.sh -host <host_name>`
     `<host_name>` is the host name of the installation host

Note
● If you enter the command without additional parameters, SAPinst GUI uses the local host as default. SAPinst GUI starts and tries to connect to the GUI server and SAPinst. As SAPinst and GUI server are running on another host, SAPinst GUI cannot connect and the *SAP Installation GUI Connection* dialog appears.

  In this case, enter the name of host on which SAPinst is running and choose *Log on*.

  The first dialog of the installation appears and you can perform the remote installation from your local host.

● For a list of options to start SAPinst GUI, change to the same directory as your SAPinst executable and enter the command `./startInstGui.sh —h`.

Only valid for: Enterprise Portal (EP)

4.4 Installing Application Sharing Server as an Optional Standalone Unit

When you install Application Sharing Server as a standalone engine on a dedicated machine, the NetWeaver Java Application Server (AS Java) is also installed. In SAPinst, there are no specific input screens for Application Sharing Server; all input screens are related to the installation of the new AS Java.

Note
If you install Application Sharing Server on a machine that already has an AS Java installed on it, an additional Java system is installed on that machine. You then have two engines running on the machine. Typically, this is not recommended as Application Sharing Server requires a dedicated machine.

Prerequisites

■ Make sure that you have read *Application Sharing Server as an Optional Standalone Unit* [page 21].
■ Your machine meets the hardware requirements for AS Java.

Procedure

1. *Start SAPinst* [page 45] on the dedicated machine.
2. In the *Welcome* screen, choose *<SAP System>* ® *Optional Standalone Units* ® *Application Sharing Server* ® *<Database>* ® *Application Sharing Server Installation*.
3. To start the installation, choose *Next*.
4. Follow the instructions in the SAPinst dialogs and enter the required parameters.

More Information

Post-Installation Steps for Application Sharing Server [page 80]

End of: Enterprise Portal (EP)

5 Post-Installation

This section provides information on how to perform the post-installation steps of your SAP system.

You perform the following post-installation steps:

1. You *start and stop the SAP system* [page 60].
2. You *log on to the SAP system* [page 61].

   Only valid for: Enterprise Portal (EP)

3. You *log on to the Enterprise Portal* [page 62].

   End of: Enterprise Portal (EP)

4. You *install the SAP License* [page 64].
5. You *install the SAP Online Documentation* [page 64].
6. You *configure the remote connection to SAP support* [page 64].
7. You *check the Java manuals* [page 65] for information that is relevant for running your Java system.
8. You *check the startup type of the Oracle Listener* [page 66].
9. You *configure the Oracle listener* [page 66].
10. You *apply the latest kernel and Support Packages* [page 66].
11. You *perform a full installation backup* [page 67].
12. You *access configuration documentation in the SAP Solution Manager* [page 68].
13. You perform *post-installation steps for Adobe Document Services* [page 69].
14. You perform *post-installation steps for Composite Application Framework* [page 72].

    Only valid for: Application Server (AS)

15. You *configure and check the BI Java Connectors* [page 74].

    End of: Application Server (AS)

    Only valid for: BI Java Components (BI-Java);Process Integration (PI)

16. You *set the environment variable CPIC_MAX_CONV* [page 80].

    End of: BI Java Components (BI-Java);Process Integration (PI)

    Only valid for: Enterprise Portal (EP)

17. You perform the *post-installation steps required for Application Sharing Server* [page 80].

    End of: Enterprise Portal (EP)

18. You *ensure user security* [page 81].

Only valid for: Application Server (AS);BI Java Components (BI-Java);Development Infrastructure (DI);Mobile Infrastructure (MI);Process Integration (PI)

19. You *run the Configuration Template Installer* [page 85] to perform basic configuration steps with the configuration template.

End of: Application Server (AS);BI Java Components (BI-Java);Development Infrastructure (DI);Mobile Infrastructure (MI);Process Integration (PI)

5.1 Starting and Stopping the SAP System

You use this procedure to check that you can start and stop the SAP system after the installation with the SAP Microsoft Management Console (SAP MMC).

With a newly installed MMC you can start or stop installed SAP instances locally on the host that you are logged on to. If the MMC is configured for central system administration, you can start or stop the entire system from a single host.

> **Note**
>
> For more information, see:
>
> `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Solution Life Cycle Management by Key Capability* ® *Solution Monitoring* ® *Monitoring in the CCMS* ® *Microsoft Management Console: Windows*

Prerequisites

■ You have logged on to the SAP system host as user `<sapsid>adm`.
■ You have checked the settings for VM parameters as described in **SAP Note** 723909.

Procedure

1. Start the SAP MMC on the SAP system host by choosing *Start* ® *Programs* ® *SAP Management Console*.
2. Right-click the SAP system node and choose *Start* or *Stop*.
   All instances listed under the system node, will start or stop in the correct order.
3. If the SAP system is installed on multiple hosts (distributed system), you have the following options to start or stop your system:
   ■ You start or stop the SAP instances using the MMC on each host.
   ■ You add the remote instances to the MMC configuration to start or stop all instances from a single MMC. To do so, do one of the following:
     ● You configure the MMC manually. For more information, see *Changing the Configuration of the MMC* in the SAP MMC documentation.
     ● You use the automatic LDAP registration. For more information, see *Configuring MMC for Active Directory Services* in the SAP MMC documentation.

> **Note**
> You can also start and stop a UNIX system with the MMC.

5.2 Logging On to the SAP System

You need to check that you can log on to the SAP system using the following standard users.

ABAP+Java User

User	User Name Storage: ABAP System
Administrator	`J2EE_ADMIN`

Java Standalone Users

User	User Name Storage: Database	User Name Storage: External ABAP System
Administrator	`Administrator`	You create this user manually during the installation process. **Recommendation** We recommend that you call the user `J2EE_ADM_<SAPSID_Java_System>` The maximum length is **12** characters.

Prerequisites

■ You have already started the SAP system.

Logging On to the J2EE Engine

1. Start a Web browser and enter the following URL:
   `http://<hostname_of_SAP_J2EE_Engine_Server>:5<Instance_Number>00`

   > **Example**
   > If you installed the J2EE Engine on host `saphost06` and the instance number of your J2EE Engine is `15`, enter the following URL:
   > `http://saphost06:51500`

   The start page of the J2EE Engine appears in the Web browser.
2. Log on by pressing *EXAMPLES* in the upper right corner of the Web page.

5.3 Logging On to the Enterprise Portal

You proceed as follows to log on to the Enterprise Portal (EP) for the first time:

1. *Establish the Enterprise Portal URL* [page]
2. *Log on to the Enterprise Portal* [page]

5.3.1 Establishing the Portal URL

All portal users, administrators and end users access the portal with a URL using a browser application from their client machines. You access the Enterprise Portal from your client machine via a browser application by entering a default URL.

The default URL consists of the installation host name and the port on which the portal is listening, combined as follows:

```
http://<fully qualified portal machine name>:<HTTP port number>/irj
```

Example

If the portal is installed on a computer identified on the network as PORTAL01, and the J2EE instance number is 16, enter the following address:

```
http://Portal01.sap.corp:51600/irj
```

To access the portal using secured socket layer communication (SSL), use the HTTPS protocol and the corresponding port, as follows:

```
https://<fully qualified portal machine name>:<HTTPS port number>/irj
```

Example

If the portal is installed on a computer that is identified on the network as Portal01, and the J2EE instance number is 16, enter the following address:

```
https://Portal01.sap.corp:51601/irj
```

Calculating the HTTP Port Number of the Portal

The HTTP port number is based on the number of the SAP J2EE instance on which you have installed the portal, according to the following formula:

```
HTTP Port = 50000 + (100*<instance number>)
```

Example

If the portal is installed on J2EE instance number 01,

Portal HTTP Port = 50000 + (100 * 1) = **50100**

Calculating the HTTPS Port Number of the Portal

The HTTPS port number is based on the following formula:

```
HTTPS Port = 50000 + (100*<instance number>) + 1
```

Example

If the portal is installed on SAP J2EE instance number 01,

   Portal HTTPS Port = **50000 + (100 * 1) + 1 = 50101**

5.3.2 Logging on to the Enterprise Portal for the First Time

User names and passwords are registered in a directory server or a user list. Initially, there is no directory server or user list associated with the portal. To connect to a user list, you have to create a user management configuration. Until you establish a connection with a user list, you log on to the portal using a **default user**. The default user is the *J2EE system administrator*. You provided the user name and password for this user during the SAP system installation.

Note

The default user logon provides you with access to the portal as a fully qualified administrator (super user). After you have logged on, you can work as a portal administrator using your own name and password.

   To do so, make sure that you are registered in the directory server or user list to which your security configuration points and that you are associated with the portal administrative role. Then log on to the portal with your own name and password.

1. Open your web browser and enter the portal URL as described in *Establishing the Portal URL* [page 62].
2. Confirm your entry by choosing *Enter*.
   The *Enter Network Password* screen appears.
3. Enter the following information:
   ■ User Name: **<J2EE Administrator name>**
   ■ Password: **<J2EE Administrator password>**
   Once you have logged on to the portal, the installation phase is complete. The portal is now ready to be configured for your chosen IT scenario.
4. Configure the portal as described in the SAP Library at:
   `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Technology Consultants Guide* ® *Running an Enterprise Portal* ® *<your scenario variant>*

Troubleshooting

If the iViews are not displayed correctly, or if the portal does not launch, refer to *Troubleshooting for Usage Type Enterprise Portal (EP)* [page 118].

| End of: Enterprise Portal (EP)

5.4 Installing the SAP License

You must install a **permanent** SAP license. When you install your SAP system, a **temporary** license is automatically installed. This temporary license allows you to use the system for **only four weeks** from the date of installation.

⚠ Caution

Before the temporary license expires, you must apply for a permanent license key from SAP.

We recommend that you apply for a permanent license key as soon as possible after installing your system.

Procedure

For information about the installation procedure for the SAP license, see:

`help.sap.com/nw2004s` ® *SAP NetWeaver* ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Solution Life Cycle Management by Key Capability* ® *SAP Licenses*

More Information

For more information about SAP license keys, see SAP Service Marketplace at `service.sap.com/licensekey`.

5.5 Installing the SAP Online Documentation

SAP currently provides an HTML-based solution for the online documentation, including the Application Help, Glossary, Implementation Guide (IMG), and Release Notes. You can display the documentation with a Java-compatible Web browser on all front-end platforms supported by SAP.

You can always find the up-to-date SAP online documentation at `help.sap.com/nw2004s`.

Process

Install the SAP online documentation in your SAP system as described in the `README.TXT` file contained in the root directory of the online documentation DVD, delivered as part of the installation package.

5.6 Configuring Remote Connection to SAP Support

SAP offers its customers access to support and a number of remote services such as the EarlyWatch Service or the GoingLive Service. Therefore, you have to set up a remote network connection to SAP. For more information, see SAP Service Marketplace at `service.sap.com/remoteconnection`.

5.7 Checking the SAP Java Documentation

Here you find information about the configuration of the J2EE Engine and about SAP Java technology in the SAP Library.

Procedure

1. Go to the following place in the documentation:
    `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Application Platform by Key Capability* ® *Java Technology*.

2. Here you find the following manuals. Check them for information that is relevant for running your Java system.

Manual	Contents
Architecture Manual	This manual describes the architecture of a Java or ABAP+Java system. It contains information on: ■ Java cluster architecture including central services, **load balancing**, and **high availability**. ■ J2EE Engine system architecture ■ SAP NetWeaver **Java development infrastructure**, including **SAP NetWeaver Developer Studio** Note The SAP NetWeaver Developer Studio is the SAP development infrastructure for Java. The Architecture Manual describes the integration of the SAP NetWeaver Developer Studio into the SAP development infrastructure.
Administration Manual	This manual describes how to administer the SAP system, focusing on the J2EE Engine. It contains information on: ■ System landscape administration ■ Software life-cycle management Note This part of the manual contains important information about: ● Installation information ● SAP System Landscape Directory (SLD) ● Software Lifecycle Manager (SLM) ● Java Support Package Manager ● Administration of SAP NetWeaver Java Development Infrastructure (JDI) ■ J2EE Engine and J2EE Engine security ■ Supportability and performance management ■ Administration and configuration of Web Dynpro runtime environment ■ Administration of the XML Data Archiving Service (XML DAS) Caution Make sure that you check the mandatory post-installation procedures listed in the Administration Manual under *J2EE Engine* ® *Installation Information* ® *Post-Installation Procedures*.

Manual	Contents
Java Development Manual	This manual describes the technologies for developing Java-based business applications. It explains how to use the SAP Netweaver Developer Studio, which is the SAP Java development environment.
Migration Manual	This manual contains all the information you need to migrate an application created in J2EE Engine 6.20.

More Information

For problems you might have with the J2EE Engine, check the *J2EE Engine Problem Analysis Guide* at
`help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Solution Life Cycle Management by Key Capability* ® *SAP NetWeaver Problem Analysis Guide (PAG)* ® *J2EE Engine Problem Analysis Scenarios.*

5.8 Checking the Startup Type of the Oracle Listener Service

Check that the startup type of `Oracle<ORACLE_HOME_NAME>TNSListener` is set to *automatic* to make sure that it is automatically restarted after booting.

Procedure

If the startup type of `Oracle<ORACLE_HOME_NAME>TNSListener` is set to manual, change it as follows:

1. Right-click on *My Computer* and choose *Manage*.
2. Double-click on *Services and Applications* and select *Services*.
3. Right-click `Oracle<ORACLE_HOME_NAME>TNSListener` and choose *Properties*.
4. Change the startup type from *manual* into *automatic*.

5.9 Configuring the Oracle Listener

If the Oracle security setup defined by the standard installation is not restrictive enough for your purposes, see **SAP Note** 186119 to configure the Oracle listener to accept only connections from specific host.

5.10 Applying the Latest Kernel and Support Packages

You use this procedure to apply the latest kernel and Support Packages for your SAP system from SAP Service Marketplace.

You can use Java Support Package Manager (JSPM) to apply both the latest ABAP+Java or Java kernel and Java support packages.

JSPM is a Java standalone tool that you can use with SAP NetWeaver 04s. JSPM uses the Software Deployment Manager (SDM) to apply support packages and patches and to deploy software components.

For more information about JSPM and how to use it, see `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Solution Life Cycle Management by Key Capability* ® *Software Life Cycle Management* ® *Software Maintenance* ® *Java Support Package Manager*

Prerequisites

Make sure that you use the latest SAPCAR version for extracting the downloaded SAR files.

SAPCAR has been made downward-compatible for all releases. Due to this change, older versions of SAPCAR can no longer unpack the current SAR files. To unpack the archives, you need at least SAPCAR 700 or SAPCAR 640 with patch level 4 or higher. For the latest SAPCAR version, see SAP Service Marketplace at `service.sap.com/swdc`.

For more information, see **SAP Note** 212876.

Procedure

1. Apply the latest kernel.

   You must **always** replace the installed kernel with the latest kernel from SAP Service Marketplace. In particular, you must replace the installed kernel if:

   ◼ You installed the kernel executables locally on every host.

   ◼ Your central instance host runs on a different operating system than your dialog instance host.

   For more information about how to download a kernel, see **SAP Note** 19466.

   To exchange the ABAP+Java kernel, you can use Java Support Package Manager (JSPM).

2. Apply Support Packages.

   a) For up-to-date information about recommended combinations of Support Packages and patches, see SAP Service Marketplace at:

   `service.sap.com/sp-stacks` ® *SAP NetWeaver 2004s.*

   For current Support Package Stack release information, see the documentation *SAP NetWeaver 2004s — Support Package Stack Guide <current version>* on SAP Service Marketplace at `service.sap.com/MaintenanceNW2004s`.

   b) Alternatively, you can download Support Packages from SAP Service Marketplace at:

   `service.sap.com/patches`

   c) Apply Support Packages to your SAP system with the help of the Java Support Package Manager (JSPM).

   For more information about the availability of Support Packages, see the SAP Service Marketplace at:

   `service.sap.com/ocs-schedules`

   > 💡 Note
   >
   > The SAP Note Assistant lets you load, implement, and organize individual SAP Notes efficiently. It also recognizes dependencies between SAP Notes, Support Packages, and modifications.
   >
   > For more information, see the SAP Service Marketplace at:
   >
   > `service.sap.com/noteassistant`

5.11 Performing a Full Installation Backup

You must perform an offline full backup at the end of the installation.

Prerequisites

◼ You have completed client maintenance (for example, client copy).

◼ You have stopped:

- ● The SAP system
- ● SAP-related services (`SAP<SAPSID>_<instance>` and `SAPOSCol`)
- ● The database
- ■ You are logged on as user `<sapsid>adm`.
- ■ You have shut down the SAP system and database.

Procedure

1. Save the registry:
   a) Choose *Start* ® *Programs* ® *Accessories* ® *System Tools* ® *Backup.*
   b) Choose *Emergency Repair Disk.*
       The *Emergency Repair Diskette* dialog box appears.
   c) Select *Also Backup the Registry to the Repair directory…*
       When you confirm your entry, the registry is written to diskette.
2. Save the system state data:
   a) Choose *Start* ® *Programs* ® *Accessories* ® *System Tools* ® *Backup.*
   b) Choose *Backup Wizard* ® *Next.*
   c) Select *Only back up the System State data* and choose *Next.*
   d) In *Where to Store the Backup*, select the *Backup media type* and enter the *Backup media* or *file name.*
   e) Choose *Next.*
   f) Check the information displayed and choose *Finish* to start the backup.
3. Back up all SAP-specific and all database-related directories:
   a) Choose *Start* ® *Programs* ® *Accessories* ® *System Tools* ® *Backup.*
   b) Choose *Backup Wizard* ® *Next.*
   c) Select *Back up selected files, drives, or network data* and choose *Next.*
   d) In *What to back up*, select the Windows directory and all SAP and database-related directories, including:

       `\USR\SAP`

       `<HOMEDIR> of <sapsid>adm`

       `\%WINDIR%`
   e) Choose *Next.*
   f) In *Where to Store the Backup*, select the *Backup media type* and enter the *Backup media or file name* for the backup.
   g) Choose *Next.*
   h) Check the information displayed and then choose *Finish* to start the backup.

5.12 Accessing Configuration Documentation in the SAP Solution Manager

To access configuration documentation in the SAP Solution Manager, you have to connect your newly-installed SAP system to the SAP Solution Manager.

> **Note**
>
> For SAP NetWeaver 2004s usage types you can also find configuration documentation in the Implementation Guide at:
>
> `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Technology Consultant's Guide*

Prerequisites

- You have installed an SAP Solution Manager system as described in the documentation *Installation Guide − SAP Solution Manager 4.0 on <OS>: <Database>.*
- You have connected your SAP system to the SAP Solution Manager as described in the documentation *Configuration Guide − SAP Solution Manager 4.0.*

For more information, see SAP Service Marketplace at `service.sap.com/solutionmanager` ® *Installation Guides* ® *Release 4.0.*

Procedure

1. Log on to your SAP Solution Manager system.
2. To be able to access configuration documentation, create a project as follows:
   a) Create your project with transaction SOLAR_PROJECT_ADMIN for project administration.
   b) Connect your SAP system to the SAP Solution Manager with transaction SMSY for the SAP Solution Manager system landscape.
   c) Create a project structure and add the required scenarios for your SAP system to your project structure with the Business Blueprint transaction SOLAR01,
   d) Add your SAP system configuration structures to your project structure with the configuration transaction SOLAR02.

   For more information about creating projects, assigning scenarios to projects, and creating configuration structures, see:

   `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Solution Life Cycle Management by Key Capability* ® *SAP Solution Manager* ® *Using the SAP Solution Manager in Projects*
3. Go to the project structure folder `<project name>` using transaction SOLAR02.
4. Access configuration documentation for SAP NetWeaver usage types at *Configuration* ® *SAP NetWeaver 2004s.*

Result

You can now configure your SAP system according to the configuration documentation in the SAP Solution Manager.

5.13 Post-Installation Steps for Adobe Document Services

You perform the following post-installation steps:

- You *assign the required roles to users ADSUSER and ADS_AGENT* [page 70].
- You *perform quick tests for Adobe Document Services (ADS)* [page 70].

5.13.1 Assigning Roles to Users ADSUSER and ADS_AGENT

During the installation SAPinst created the users ADSUSER for basic authentication and ADS_AGENT for processing forms between an ABAP and a Java environment.

   After the installation you have to assign the required authorization roles manually to these users in the ABAP system, as described below.

Assigning Role SAP_BC_FP_ICF to ADS_AGENT

1. *Log on to the ABAP system* [page <u>61</u>].
2. Call transaction SU01.
3. Enter ADS_AGENT in the *User* field.
4. Choose *User Names* ® *Change*
5. Choose the *Roles* tab and assign the role SAP_BC_FP_ICF to the user ADS_AGENT.

Creating Role ADSCallers and Assigning it to ADSUSER

1. *Log on to the ABAP system* [page <u>61</u>].
2. Call transaction PFCG.
3. Enter **ADSCallers** in the *Role* field.
4. Choose *Role* ® *Create*
5. On the screen *Create Roles*, choose *Role* ® *Save*
6. Choose the *User* tab and assign the user ADSUSER in the *User ID* field.

5.13.2 Installation Check and Quick Tests for Adobe Document Services

This procedure shows you how to check your installation of Adobe Document Services (ADS) entries for the correct user, security role, passwords, and RFC destination.

> **Note**
>
> This procedure contains only minimal configuration steps to check if the ADS installation with SAPinst was successful.
>
> For detailed configuration documentation, see the configuration guide for Adobe Document Services:
>
> ■ On SAP Service Marketplace at:
>   `service.sap.com/adobe` ® *Interactive Forms Based on Adobe Software* ® *Media Library* ® *Documentation* ® *Adobe Document Services - Configuration Guide NW 2004s*
> ■ In the SAP Library at:
>   `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Technology Consultant's Guide* ® *Additional Cross-NetWeaver Configurations* ® *Adobe Document Services - Configuration.*

Procedure

Checking the User and Password

1. Enter the following URL in your web browser:
   `http://<server>:<port>/AdobeDocumentServices/Config` where `<server>`
   is the name of the J2EE engine where the Adobe document services are installed and `<port>` is the port of the J2EE engine.

   > **Note**
   >
   > Note that the entries in the URL are case-sensitive.

   The web page of the Web service *AdobeDocumentServices* is displayed.
2. Choose *Test*.
3. Choose *rpdata(test...)*.
4. Choose *Send* without entering any parameters.
5. Enter **ADSUser** as user name and the password you entered for this user previously.
6. Choose *Submit*.

Result

If the setup is correct, the system displays the version number in the response area.

> **Note**
>
> You can ignore the message `Required stream:  "PDFDocument" not found.`

If the setup is not correct, the page does not change and *Submit* remains on the screen.

Checking the ABAP Connection

1. Log on to your SAP system.
2. Call transaction `SE38`.
3. Enter the name of the test report `FP_PDF_TEST_00`.
4. Choose *Execute* (`F8`).

Result

If the setup is correct, the system displays the version number.

If the setup is not correct, the system displays a dialog box with input fields for the user and password. Check your settings for the ABAP connection.

Troubleshooting

If the tests are not successful, you might have to make some adjustments to the *initial technical configuration for ADS* [page 99].

5.14 Performing Post-Installation Steps for Composite Application Framework Core (CAF Core)

In SLD

1. In the SAP System Landscape Directory (SLD), create a new project.
2. Create a new software component (SC) to be developed.
3. Create SCs of the build plug-ins for the dependent development component (DC). They are:

Archive Names			
BI-MMR	CAF-KM	EPBC2	SAP_JTECHS
BI_UDI	CAF-UM	EP-PSERV	SAP_PRT
BI-REPPLAN	EC-JSTARTUP	KMC-CM	SAP-EU
BI-WDALV	EP_BUILDT	LM-TOOLS	SAP-JEE
CAF	EPBC	SAP_BUILDT	UWLJWF

> **Note**
>
> Only create the SCs if they are missing from the project. These will be used when importing in the *Change Management Service* (CMS).

4. Define the build plug-in dependencies created in step 3 above.
5. Define the SC dependencies created in step 2 above.

> **Note**
>
> When importing SLD content downloaded from SAP Service Marketplace into your NWDI landscape, you also import necessary dependencies. There you can skip step 5.
>
> The SLD content can be downloaded from the SMP at: `service.sap.com/patches` ® *Entry by Application Group* ® *Support Packages and Patches* ® *Additional Components* ® *SAP Master Data for SLD* ® *SAP Master Data for SLD 2.0.*

In CMS

> **Note**
>
> For all documents referenced in this section, see the administration chapter of the *SAP NetWeaver Java Development Infrastructure.* You can find this documentation at `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Administrator's Guide* ® *Technical Operations Manual for SAP NetWeaver* ® *Administration of SAP NetWeaver Systems* ® *Development Infrastructure.*

1. In CMS, identify or create a domain.
   See *Change Management Service* ® *Configuring Domains.*
2. Identify an existing track or create a new track for composite application development in *Landscape Configurator* ® *Creating a Development Track.*
3. Add the SC created in step 2 in the section above to the track.
4. Add the runtime system of the track.
   See *Landscape Configurator* ® *Creating a Development Track* ® *Configuring Runtime Systems.*
5. Check in the archives listed in the table below.

Archive Names			
BI-MMR	CAF-KM	EPBC2	SAP_JTECHS
BI_UDI	CAF-UM	EP-PSERV	SAP_PRT
BI-REPPLAN	EC-JSTARTUP	KMC-CM	SAP-EU
BI-WDALV	EP_BUILDT	LM-TOOLS	SAP-JEE
CAF	EPBC	SAP_BUILDT	UWLJWF

6. Import the archives into the track.
   See also `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Administrator's Guide* ® *Technical Operations Manual for SAP NetWeaver* ® *Administration of SAP NetWeaver Systems* ® *Development Infrastructure* ® *SAP NetWeaver Development Infrastructure* ® *Working with the SAP NetWeaver DI* ® *Administration of the SAP NetWeaver DI* ® *Transports with the NWDI* ® *Imports.*

Only valid for: Application Server (AS)

5.15 Configuring and Checking the BI Java Connectors

5.15.1 Configuring the BI Java Connectors

Configure the BI Java Connectors as follows:

1. Check the prerequisites in the table below.
   Depending on the connector you want to use, specific prerequisites might be necessary.

Connector	Prerequisites

BI JDBC Connector	If you have not already done so, you must first deploy your data source's JDBC driver, performing the following steps:
	
	a) Start the Visual Administrator. .
	
	   A) On your central instance host, change to the `admin` directory: (path: `\usr\sap\<SAPSID>\<instance_number>\j2ee\admin`):
	
	   B) Double-click `go.bat`.
	
	b) In the Cluster tab select *Server x* ® *Services* ® *JDBC Connector*.
	
	c) In the right frame, select the node *Drivers* on the *Runtime* tab.
	
	d) From the icon bar choose *Create New Driver or Data source*.
	
	e) In the *DB Driver* field in the *Add Driver* dialog box, enter a name of your choice for your JDBC driver.
	
	f) Navigate to your JDBC driver's JAR file and select it.
	
	g) To select additional JAR files, select *Yes* when prompted; if finished, select *No*.
	
	💡 Note
	If any changes are made to the JDBC Connector, the properties all need to be added and re-saved (see *Services* ® *Connector Container* ® *JDBC Connector* ® *Managed connections tab* ® *Properties*.

BI ODBO Connector	■ As the ODBO connector leverages Microsoft's OLE DB for OLAP, this connector can only be used on Windows 2003 systems. ■ Microsoft Data Access Components (MDAC) 2.6 or greater ODBO (OLE DB for OLAP) driver for your data source ■ ODBO (OLE DB for OLAP) driver for your data source
BI SAP Query Connector	No prerequisites.
BI XMLA Connector	No prerequisites.

2. Start the Visual Administrator:
   a) On your central instance host, change to the `admin` directory:
      (path: `\usr\sap\<SAPSID>\<instance_number>\j2ee\admin`):
   b) Double-click `go.bat`.

3. In the *Cluster* tab, choose *Server <x>* ® *Services* ® *Connector Container*.

4. In the *Runtime* tab (right frame), choose the tab *Managed Connection Factory* ® *Properties*.

5. You configure the properties for each connector as follows:

    a) In the *Connector Container* box select the connector (*Connectors* ® *Connector 1.0*) that you want to configure. If you have selected a connector, you can configure it in the already opened *Properties* tab.

    b) Configure each connector according to the tables below.

    c) When you have configured a connector, choose *Add* on the *Properties* tab to transfer the changes into the active properties and save your settings.

Connection Properties for the BI JDBC Connector

Property	Description	Examples
USERNAME	Data source user name User with at least reading authorization for the data source. (These authorizations differ according to the used data source.)	(your user name)
PASSWORD	Data source password	(your password)
URL	URL string specifying the location of a database (used by the `java.sql.DriverManager` to determine which driver to use)	`jdbc:inetdae7:domain:port?` `database=mydatabase`
DRIVERNAME	Class name of JDBC driver used for this connection	`com.inet.tds.TdsDriver`
FIXED_CATALOG	**Optional** Restriction of metadata access to metadata contained in specified catalog. *Null* means no restriction.	null (no restriction) xyz (restrict to catalog "xyz")
FIXED_SCHEMA	**Optional** Restriction of metadata access to metadata contained in specified schema. *Null* means no restriction.	null (no restriction) xyz (restrict to schema "xyz")
LANGUAGE	**Optional** Two-letter abbreviation of language. The language property specifies the language of exceptions evoked on the BI Java SDK layer. JDBC databases themselves do not support this property.	EN = English DE = German

💡 Note

For the BI JDBC Connector only:

Configure a reference to your JDBC driver using the steps below:

1. In the *Connector Container* box, choose the BI JDBC Connector in the *Connectors* tree.
2. Choose the *Resource Adapter* tab.
3. In the *Loader Reference* box, choose *Add* to add a reference to your JDBC driver.
4. Enter `library:<jdbc driver name>` and choose *OK*.

   The `<jdbc driver name>` is the name you entered for your driver in step 1 above.
5. Save your settings.

Connection Properties for the BI OBDO Connector

Property	Description	Examples
USERNAME	Data source user name User with at least reading authorization for the data source. (These authorizations differ according to the used data source.)	(your user name)
PASSWORD	Data source password	(your password)

CONNECTION_STRING	Connection string information such as provider name, file name, remote provider, remote server, and URL.
	
	💡 Note
	For BW OLAP providers, to completely suppress the SAP Logon screen at runtime, make sure that you also provide values for the USERNAME, PASSWORD, and LANGUAGE properties above. If you want to evoke the logon screen, you might specify the *ConnString* property only.
	
	Preconfigured value:
	`Data Source="C:\\public\Sales.cub"; Provider=msolap`
		Local cube:
		`Provider=MSOLAP;Location = "c:\public\Sales Overview.cub"`
		Microsoft Analysis Server:
		`Provider=MSOLAP;data source=palbiteam`
		BW OLAP provider:
		`Data Source=BWP;Provider=MDrmSAP; SFC_CLIENT=010;SFC_LANGUAGE=EN`

LOGON_AS_USER_ID	**Optional** User name of a given windows domain account. Empty string means property not set.	(your username)

Property	Description	Examples
LOGON_AS_USER_PASSWORD	**Optional** Password for a given windows domain account. Empty string means property not set.	(your password)
LOGON_AS_USER_DOMAIN	**Optional** Windows domain account name. Empty string means property not set.	(a Windows domain name)

Note

The BI ODBO Connector can only be configured against a local cube file.

Connection Properties for the BI SAP Query Connector

Property	Description	Examples
USERNAME	Data source user name User with at least reading authorization for the data source. (These authorizations differ according to the used data source.)	(your user name)
PASSWORD	Data source password	(your password)
LANGUAGE	Two-letter abbreviation of language The language property sets the logon language for your system and also specifies the language of exceptions evoked on the BI Java SDK layer.	`EN` = English `DE` = German
CLIENT	Client specified as three-digit integer	`000`
MESSAGESERVER	Host name for message server	`server1.mydomain.com`
APPLICATIONSERVER	Host name for application server	`server1.mydomain.com`
SYSTEMNUMBER	Two-digit integer identifying the R/3 instance	`00`
SERVERGROUP	Logon group for load balancing	a string, such as `PUBLIC` or `SPACE`
R3NAME	R/3 name	`OSS`
QUERYAREA	Single-character value (`char`) specifying whether the SAP Query area is global (client-independent) or local (client-dependent). Default value is local.	`X` = global `[blank]` = local

💡 Note

For the set of connection properties relevant for your system, refer to the JCo documentation in your JCo download.

If you have troubles establishing a connection to a server that does not have a PUBLIC logon group, try removing the properties for `R3NAME` and `SERVERGROUP`. For more connection troubleshooting information see the JCo documentation on SAP Service Marketplace (`service.sap.com/connectors`).

Connection Properties for the BI XMLA Connector

Property	Description	Examples
USERNAME	Data source user name User with at least reading authorization for the data source. (These authorizations differ according to the used data source.)	(your user name)
PASSWORD	Data source password	(your password)
LANGUAGE	**Optional** Two-letter abbreviation of language The language property specifies the language of exceptions evoked on the BI Java SDK layer. JDBC databases themselves do not support this property.	`EN` = English `DE` = German

URL	Server URL
	You can find the URL of a BW XMLA provider by executing the function module `RSBB_URL_PREFIX_GET` in transaction SE37.
	For the import parameters of the function module, use the following values:
	■ `I_HANDLERCLASS =`
	　`CL_RSR_MDX_SOAP_HANDLER`
	■ `I_PROTOCOL = HTTP`
	■ `. = X`
	The URL path is always
	`*/sap/bw/xml/soap/xmla`
		BW XMLA provider:
		`http://[domain:port]/sap/bw/xml/soap/xmla`
		MS Analysis Server:
		`http://[domain:port]/isapi/msxisapi/dll`

DATASOURCE	Data source info property	Local Analysis Server
STATEFULNESS	**Optional** Statefulness support. Default is `false`.	`true` or `false`

Property	Description	Examples
LOGONMETHOD	Specifies authentication mechanism (logon method).	**UIDPW** Log on to your XMLA provider using User/Password. Use this method for XMLA-based access to BW providers. This is the sole authentication method supported in the unmanaged environment. **SAPLOGONTICKET** Log on to your XMLA provider using SAP Logon Ticket (supported by SAP BW XMLA providers). If you want to use the SAP Logon Ticket (SSO) to access BW systems, use this property .
TIMEOUT	Maximum time to wait for the SOAP connection (in milliseconds). Default is 30000 (thirty seconds).	60000 - to increase timeout to one minute.

Note

For the BI XMLA Connector only:

If you are using the `SAPLOGONTICKET` authentication method, configure BW to accept user\SAPLogonTicket pairs for authentication (instead of only user\password pairs) using the procedures below:

1. Configure SSO between the J2EE engine and the SAP BW system (so that ABAP accepts SSO from the J2EE engine) using the instructions at `help.sap.com` ® *Documentation* ® *SAP NetWeaver* ® *Security* ® *User Authentication and Single Sign-On* ® *Authentication on the J2EE Engine* ® *Configuring Authentication Mechanisms* ® *Using Logon Tickets for Single Sign-On* ® *Configuring the Use of Logon Tickets* ® *Configuring the SAP Web AS ABAP to Accept Logon Tickets from the J2EE Engine.*
2. Configure SSO between the SAP BI system and the J2EE engine (so that the J2EE engine accepts SSO from ABAP) using the instructions at `help.sap.com` ® *Documentation* ® *SAP NetWeaver* ® *Security* ® *User Authentication and Single Sign-On* ® *Authentication on the J2EE Engine* ® *Configuring Authentication Mechanisms* ® *Using Logon Tickets for Single Sign-On* ® *Configuring the Use of Logon Tickets* ® *Configuring the J2EE Engine to Accept Logon Tickets.*

Configure BI to accept user\SAPLogonTicket pairs for authentication (instead of only user\password pairs) using the procedure below.

Note

For the BI XMLA Connector only:

If an error occurs when configuring and testing the BI XMLA Connector, apply **SAP Note** 863672.

5.15.2 Checking the Connectors Implementation

After the configuration of the different connectors, you can perform a rough installation check by just displaying the different connector pages.

Connector	URL	Result
BI JDBC Connector	`http://<host>:<port>/TestJDBC_Web/TestJDBCPage.jsp`	A list of Cubes and/or tables is displayed.
BI ODBO Connector	`http://<host>:<port>/TOdbo/servlet/TestOdbo`	
BI SAP Query Connector	`http://<host>:<port>/TSapq/servlet/TestSapq`	
BI XMLA Connector	`http://<host>:<port>/TXmla/servlet/TestXmla`	

> **Note**
>
> These tests are designed to work with the default installation of the BI Java Connectors. Cloned connectors with new JNDI names are not tested by these servlets.

> **Note**
>
> Your connector is now ready for use in a managed environment.
>> You can also clone an existing connection by using the *Clone* button in the toolbar.
>> For *Universal Data Connect (UD Connect)* only:
>> When entering the resource adapter name during the cloning process, you must prefix the name with `SDK_` in order to properly recognize the connector.

> **Note**
>
> If you encounter problems when saving your configuration data, the corresponding connector might be not up and running. You will have to stop and restart the application in the deploy service of the Visual Administrator.

Result

Your connector is now ready for use in a managed environment.

End of: Application Server (AS)

Only valid for: BI Java Components (BI-Java);Process Integration (PI)

5.16 Setting Environment Variable CPIC_MAX_CONV

1. Log on to your operating system as user `<SAPSID>adm`.
2. Set environment variable `CPIC_MAX_CONV` to a higher value (at least **200**) and restart the system.

End of: BI Java Components (BI-Java);Process Integration (PI)

Only valid for: Enterprise Portal (EP)

5.17 Post-Installation Steps for Application Sharing Server

After you have installed the necessary software, you must complete a number of configuration steps in the portal to fully implement application sharing functionality in the portal. These steps are valid if you

installed Application Sharing Server as a standalone engine or are using the default server installed on the portal machine.

For more information, see:

`help.sap.com/nw2004s` ® *SAP NetWeaver* ® *SAP NetWeaver by Key Capability* ® *People Integration* ® *Collaboration* ® *Administration Guide* ® *Real-Time Collaboration* ® *Configuring Real-Time Collaboration* ® *Configuring the Application Sharing Server (RTC)*.

This documentation includes information on how you define which Application Sharing Server the portal must use.

If you do not intend to use Application Sharing Server, you can disable it. For more information, see:

`help.sap.com/nw2004s` ® *SAP NetWeaver* ® *SAP NetWeaver by Key Capability* ® *People Integration* ® *Collaboration* ® *Administration Guide* ® *Real-Time Collaboration* ® *Configuring Real-Time Collaboration* ® *Configuring the Application Sharing Server (RTC)* ® *Enabling / Disabling the Application Sharing Server (RTC)*.

> End of: Enterprise Portal (EP)

5.18 Ensuring User Security

You need to ensure the security of the users that SAPinst creates during the installation. For security reasons, you also need to copy the installation directory to a separate, secure location — such as a DVD — and then delete the installation directory.

⬆ Recommendation

In all cases, the user ID and password are only encoded when transported across the network. Therefore, we recommend using encryption at the network layer, either by using the Secure Sockets Layer (SSL) protocol for HTTP connections, or Secure Network Communications (SNC) for the SAP protocols dialog and RFC.

For more information, see:

`help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Security* ® *Network and Transport Layer Security*

⚠ Caution

Make sure that you perform this procedure **before** the newly installed SAP system goes into production.

Prerequisites

If you change user passwords, be aware that SAP system users might exist in multiple SAP system clients (for example, if a user was copied as part of the client copy). Therefore, you need to change the passwords in all the relevant SAP system clients.

Procedure

For the users listed below, take the precautions described in the relevant SAP security guide, which you can find on SAP Service Marketplace at `service.sap.com/securityguide`:

Operating System and Database Users

User	User Name	Comment
Operating system user	`<sapsid>adm`	SAP system administrator
	`SAPService<SAPSID>`	User to run the SAP system
Oracle database user	`SAP<SCHEMA_ID>`	Oracle database owner (that is, the owner of the database tables)
	`SYSTEM`	–
	`SYS`	–
	`OUTLN`	–
	`DBSNMP`	–

Java Add-In Users for Users Stored in the ABAP System

User	User Name Storage: ABAP System	Comment
Administrator	The name that you gave this user during the installation or the default name `J2EE_ADMIN`	This user's password is stored in secure storage. Therefore, whenever you change the administrator's password, you must also change the password in secure storage. For more information, see *Checking the SAP Java Documentation* [page 65].
Guest	The name that you gave this user during the installation or the default name `J2EE_GUEST`	—
Communication user for the J2EE Engine	The name that you gave this user during the installation or the default name `SAPJSF`	—
Users for Adobe Document Services (ADS)	`ADSUSER`	User exists at least in the clients 000 and 001 of the ABAP system.
	`ADS_AGENT`	User exists at least in the clients 000 and 001 of the ABAP system.
Data supplier user for System Landscape Directory (SLD) (optional)	The name that you gave this user during the installation. The recommended name is `SLDDSUSER`.	User exists at least in the clients 000 and 001 of the ABAP system. Note SAPinst created this user automatically if you chose *Configure local SLD* during the installation.
ABAP API user for System Landscape Directory (SLD) (optional)	The name that you gave this user during the installation. The recommended name is `SLDAPIUSER`.	User exists at least in the clients 000 and 001 of the ABAP system. Note SAPinst created this user automatically if you chose *Configure local SLD* during the installation.

Note

You can set up Java standalone users with the SAP User Management Engine (UME) in one of the following ways:

■ With the users stored in an external ABAP system — see the first table below
■ With the users stored in the database — see the second table below

The next two tables show these ways of managing the users.

Java Standalone Users for Users Stored in an External ABAP System

User	User Name Storage: External ABAP System	Comment
Administrator	You create this user manually in the external ABAP system during the installation process. **Recommendation** We recommend that you call the user `J2EE_ADM_<SAPSID_Java_System>` The maximum length is **12** characters.	This user's password is stored in secure storage. Therefore, whenever you change the administrator's password, you must also change the password in secure storage with the J2EE Engine Config Tool . For more information, see *Checking the SAP Java Documentation* [page 65].
Guest	You create this user manually in the external ABAP system during the installation process. **Recommendation** We recommend that you call the user `J2EE_GST_<SAPSID_Java_System>` The maximum length is **12** characters.	Lock this user for interactive logon.
Communication user for the J2EE Engine	You create this user manually in the external ABAP system during the installation process. **Recommendation** We recommend that you call the user `SAPJSF_<SAPSID_Java_System>` The maximum length is **12** characters.	Specify this user as a *Communications* user and not as a dialog user. This user exists at least in the SAP system client that you specified during the installation.
Users for Adobe Document Services (ADS)	`ADSUSER`	User exists at least in the clients 000 and 001 of the external ABAP system. You must have created this user manually in the external ABAP system before you started the installation. For more information, see *Preparing User Management for an External ABAP System* [page 94].
	`ADS_AGENT`	User exists at least in the clients 000 and 001 of the external ABAP system. You must have created this user manually in the external ABAP system before you started the installation. For more information, see *Preparing User Management for an External ABAP System* [page 94].

User	User Name Storage: External ABAP System	Comment
Data supplier user for System Landscape Directory (SLD) (optional)	The name that you gave this user when you *created it manually* [page 94]. The recommended name is SLDDSUSER.	User exists at least in the clients 000 and 001 of the external ABAP system
ABAP API user for System Landscape Directory (SLD) (optional)	The name that you gave this user when you *created it manually* [page 94]. The recommended name is SLDAPIUSER.	User exists at least in in the clients 000 and 001 of the external ABAP system

Java Standalone Users for Users Stored in the Database

User	User Name Storage: Database	Comment
Administrator	The name that you gave this user during the installation or the default name Administrator	This user's password is stored in secure storage. Therefore, whenever you change the administrator's password, you must also change the password in secure storage with the J2EE Engine Config Tool. For more information, see *Checking the SAP Java Documentation* [page 65].
Guest	The name that you gave this user during the installation or the default name Guest	Lock this user for interactive logon.
Users for Adobe Document Services (ADS)	ADSUSER	This user's password is stored in secure storage. Therefore, whenever you change the administrator's password, you must also change the password in secure storage with the J2EE Engine Config Tool. For more information, see *Checking the SAP Java Documentation* [page 65].
	ADS_AGENT	This user's password is stored in secure storage. Therefore, whenever you change the administrator's password, you must also change the password in secure storage with the J2EE Engine Config Tool. For more information, see *Checking the SAP Java Documentation* [page 65].
Data supplier user for System Landscape Directory (SLD) (optional)	The name that you gave this user during the installation. The recommended name is SLDDSUSER.	Note SAPinst created this user automatically if you chose *Configure local SLD* during the installation.

Only valid for: Application Server (AS);BI Java Components (BI-Java);Development Infrastructure (DI);Mobile Infrastructure (MI);Process
Integration (PI)

5.19 Running the Configuration Template Installer

Only valid for: Application Server (AS)

After SAPinst has finished, you need to run the following configuration templates using the Template Installer
in order to automatically configure the **NetWeaver Administrator (NWA)**:

End of: Application Server (AS)

Only valid for: Application Server (AS)

1. *SLD system: Configure and activate SLD*
2. *SLD system: Connect SLD to CEN (if CEN present)*
3. *NWA system: Basic configuration*
4. *NWA system: Connect NWA to CEN (if CEN present)*
5. *NWA system: Store access data per each managed Java system (optional)*
6. *NWA system: Register each managed ABAP system to SLD*
7. *Managed Java system: Register system to SLD*

End of: Application Server (AS)

Only valid for: Application Server (AS)

💡 Note

For more information on the NetWeaver Administrator, see `service.sap.com/operationsnw2004s` ®
Monitoring ® *Monitoring Setup Guide for NW 2004s SP Stack 06 and SR1* .

End of: Application Server (AS)

Only valid for: BI Java Components (BI-Java)

Usage type BI Java: After SAPinst has finished, you need to run the configuration template
`BIPostInstallProcess` using the Template Installer.

End of: BI Java Components (BI-Java)

Only valid for: Development Infrastructure (DI)

  Usage type DI: After SAPinst has finished, you need to run the configuration template `DI`
`Postinstallation` using the Template Installer.

End of: Development Infrastructure (DI)

Only valid for: Development Infrastructure (DI)

1. Start the Template Installer for your scenario from the NetWeaver Administrator.
2. Choose the template you need – you need to differentiate the following cases:
   a) To install and run the complete NWDI on this system perform the step **All-in-one Complete**
      Configuration of DI, CBS, CMS, and DTR.

> ⬆️ **Recommendation**
>
> We recommend that you use this step.

b) To configure the services individually (DTR, CBS, CMS) – for example because you have distributed the usage type DI to different servers – perform the following steps:

DI Configuration

Choose each of the items you need: *Design Time Repository Configuration, Component Build Service, Change Management Service.*

> 💡 **Note**
>
> Before performing any database settings make sure that you have read **SAP Note** 889038.

3. If you are using a **new** Oracle database installation perform the step **Set Oracle Parameters for DI** — do not use this for an already configured database because previous settings will be overwritten.

4. After the Template Installer has finished, an engine restart might be necessary. For more information see **SAP Note** 919942.

End of: Development Infrastructure (DI)

Only valid for: Development Infrastructure (DI)

Importing the Build Archives

End of: Development Infrastructure (DI)

Only valid for: Development Infrastructure (DI)

After the template has finished, a track is created at the end of the post-installation process. To prepare the track for development, you need to check-in and import build archives into the track.

End of: Development Infrastructure (DI)

Only valid for: Development Infrastructure (DI)
---

1. Before the first check-in and import of the build archives, restart the J2EE Engine once.

2. Copy the build archives `SAPJEE0x_0.SCA` , `SAPJTECHS0x_0.SCA` and `SAPBUILDT0x_0.SCA` from the folder `\usr\sap\trans\EPS\in\` `CMSP< hostname><SID>` into the CMS inbox folder `\usr\sap\JTrans\CMS\inbox`.

3. Start the CMS Web UI with user NWDI_ADM.

4. Select the *Demo* track in the Transport Studio.

5. Switch to the *Check-In* tab.

6. Click on the *Value help* button.

7. Select the following software components:

   ▪ `sap.com SAP-JEE`

   ▪ `sap.com SAP_JTECHS`

   ▪ `sap.com SAP_BUILDT`

8. Switch to the *Development* tab.

9. Select *Select All* and then *Import*.

10. Switch to the *Consolidation* tab.

11. Select *Select All* and then *Import*.

End of: Development Infrastructure (DI)

💡 Note

You can run the configuration template installer only once and only directly after the installation.

You cannot use the configuration template after

- Upgrade
- Add-In installation
- Additional usage type enablement

In these cases, you need to perform the corresponding configuration steps as described in the configuration documentation.

For more information on **how to access the configuration documentation**, see *Accessing Configuration Documentation in the SAP Solution Manager* [page 68].

You find configuration documentation also in the Implementation Guide in the SAP Library at `help.sap.com/nw2004s` ® *SAP NetWeaver* ® *Technology Consultant's Guide* ® *<choose your scenario>* ® *Configuration of Usage Type <x>*.

For more information on **how to start the Template Installer**, see:

`help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Technology Consultant's Guide* ® *Developing, Configuring, and Adapting Applications* ® *Creating Java Applications Using Web Dynpro* ® *J2EE Engine Configuration* ® *Template Installer*

End of: Application Server (AS);BI Java Components (BI-Java);Development Infrastructure (DI);Mobile Infrastructure (MI);Process Integration (PI)

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6 Additional Information

The following sections are **optional** and provide important additional information:

Preparation

■ *Installation of Multiple Components in One Database* [page 89]
■ *Integration of LDAP Directory Services* [page 91]
■ *Preparing the Active Directory* [page 93]
■ *Preparing User Management with an External ABAP system* [page 94]

Post-Installation

■ If required, you *configure user management to use an LDAP directory* [page 98].
■ *Entries in the Services File Created by SAPinst* [page 98]
■ *Usage Type-Specific Initial Technical Configuration* [page 98]
■ *Deleting an SAP System* [page 108]
■ *SAP System Security on Windows* [page 113]
■ *Automatic Creation of Accounts and Groups* [page 114]
■ *Manually Granting User Rights for the Installation* [page 116]
■ *Troubleshooting* [page 117]

6.1 Installation of Multiple Components in One Database (Optional)

You can install **multiple** SAP systems in a **single** database. This is called Multiple Components in One Database (MCOD).

Example
    You install an SAP NetWeaver central system and an SAP CRM central system in a single database.

MCOD is available with all SAP components. We are releasing this technology on all the major databases for the SAP system, in line with our commitment to deliver platform-independent solutions.
    Using this technology is as easy as installing a separate component. No extra effort is required because the MCOD installation is fully integrated into the standard installation procedure. MCOD is not an additional installation service. Instead, it is an option of the database instance installation.
    With MCOD we distinguish two scenarios:

■ The installation of an SAP system in a new database
■ The installation of an additional SAP system in an existing database

Prerequisites

- For more information on MCOD and its availability on different platforms, see the SAP Service Marketplace at `service.sap.com/mcod`.
- MCOD is released for Unicode installations. A prerequisite is that the MCOD system contains Unicode instances only. SAP does not support mixed solutions.
- Improved sizing required

  In general, you calculate the CPU usage for an MCOD database by adding up the CPU usage for each individual SAP system. The same applies to memory resources and disk space.

  You can size multiple components in one database by sizing each individual component using the SAP Quick Sizer and then adding the requirements together. For more information on the SAP Quick Sizer, see the SAP Service Marketplace at `service.sap.com/sizing`.

Features

- Reduced administration effort
- Consistent system landscape for backup, system copy, administration, and recovery
- Increased security and reduced database failure for multiple SAP systems due to monitoring and administration of only one database
- Independent upgrade

  In an MCOD landscape you can upgrade a single component independently from the other components running in the same database, assuming that the upgraded component runs on the same database version. However, if you need to restore a backup, be aware that all other components are also affected.

💡 Note

  Special MCOD considerations and differences from the standard procedure are listed where relevant in the installation documentation.

Constraints

⬆ Recommendation

  We **strongly recommend** that you test MCOD in a test or development system.

  We recommend that you run MCOD systems in the same context. We do not recommend that you mix test, development, and production systems in the same MCOD.

- In the event of database failure, all SAP systems running on the single database are affected.
- Automated support in an MCOD landscape for the following administrative tasks depends on your operating system and database:
  - Copying a single component from an MCOD landscape to another database at database level.
  - De-installing a single component from an MCOD landscape requires some additional steps. You can use a remote connection to SAP support to request help with these tasks. For more information see `service.sap.com/remoteconnection`.
- You **cannot** install a Unicode SAP system with a non-Unicode SAP system in one database.

Only valid for: HA (MSCS)

- **MSCS only:** You **cannot** install multiple components in one database with Microsoft Cluster Service (MSCS). For more information on MSCS, see *Microsoft Cluster Installation.*

End of: HA (MSCS)

- For the first SAP system, the database system ID can be different from the SAP system ID.
- For the second SAP system, make sure that you use the same `DBSID` as for the first SAP system.
- If you install a system into an existing database (MCOD), make sure that the SYSTEM tablespace contains at least 350 MB of free space. If there is not enough space left, increase the size of this tablespace with BRSPACE or BRTOOLS.
- If you decide to turn off database logging during the database load phase of the installation, you need to plan downtime for all MCOD systems sharing the database.

6.2 Integration of LDAP Directory Services (Optional)

The Active Directory is a Lightweight Directory Access Protocol (LDAP) directory. LDAP is a feature of Windows 2000 or higher that allows important information within a corporate network to be stored centrally on a server. The advantage of storing information centrally for the entire network is that you have to maintain data only once, thus avoiding redundancy and inconsistency.

If an LDAP directory is available in your corporate network, you can configure the SAP system to use this feature. For example, a correctly configured SAP system can read information from the directory and also store information there.

This section explains the benefits of using the SAP system with the LDAP directory. In addition, it gives an overview of the configuration steps required to use an SAP system with the directory.

> **Note**
>
> The SAP system can interact with the Active Directory using the LDAP protocol, which defines:
>
> - The communication protocol between the SAP system and the directory
> - How data in the directory is structured, accessed, or modified
>
> If a directory other than the Active Directory also supports the LDAP protocol, the SAP system can take advantage of the information stored there. For example, if there is an LDAP directory on a UNIX or Windows server, you can configure the SAP system to use the information available there. In the following text, directories other than the Active Directory that implement the LDAP protocol are called **generic LDAP directories**.

Prerequisites

You can only configure the SAP system for Active Directory services or other LDAP directories if these are **already available** on the network. As of Windows 2000 or higher, the Active Directory is automatically available on all domain controllers. A generic LDAP directory is an additional component that you must install separately on a UNIX or Windows server.

Features

In the SAP environment, you can exploit the information stored in an Active Directory or generic LDAP directory by using:

■ SAP Logon
■ The Microsoft Management Console (MMC)

For more information on the automatic registration of SAP components in LDAP directories and the benefits of using it in SAP Logon and MMC, see the documentation *SAP System Information in Directory Services* on SAP Service Marketplace at `service.sap.com/msplatforms` ® *Microsoft* ® *Windows Server*

SAP Logon

Instead of using a fixed list of systems and message servers, you can configure the SAP Logon in the `sapmsg.ini` configuration file to find SAP systems and their message servers from the directory. If you configure SAP logon to use the LDAP directory, it queries the directory each time *Server* or *Group* selection is chosen to fetch up-to-date information on available SAP systems.

To use LDAP operation mode, make sure that the `sapmsg.ini` file contains the following:

```
[Address]
Mode=LDAPdirectory
LDAPserver=
LDAPnode=
LDAPoptions=
```

Distinguish the following cases:

■ If you use an Active Directory, you must set `LDAPoptions="DirType=NT5ADS"`. For more information, see the SAP system profile parameter `ldap/options`.
■ You must specify the directory servers (for example, `LDAPserver=pcintel6 p24709`) if either of the following is true:
   ● The client is not located in the same domain forest as the Active Directory
   ● The operating system does not have a directory service client (Windows NT and Windows 9X without installed *dsclient*).
   For more information, see the SAP system profile parameter `ldap/servers`.
■ For other directory services, you can use *LDAPnode* to specify the distinguished name of the SAP root node. For more information, see the SAP system profile parameter `ldap/saproot`.

MMC

The MMC is a graphical user interface (GUI) for administering and monitoring SAP systems from a central location. If the SAP system has been prepared correctly, the MMC presents and analyzes system information that it gathers from various sources, including the Active Directory.

Integrating the Active Directory as a source of information has advantages for the MMC. It can read system information straight from the directory that automatically registers changes to the system landscape. As a result, up-to-date information about all SAP application servers, their status, and parameter settings is always available in the MMC.

If you need to administer distributed systems, we especially recommend that you use the MMC together with Active Directory services. For example, you can simplify administration by using the MMC in a distributed environment that implements the mySAP Business Suite components SAP BW, SAP SRM, SAP SCM, and SAP

CRM. You can keep track of significant events in all of the systems from a single MMC interface. You do not need to manually register changes in the system configuration. Instead, such changes are automatically updated in the directory and subsequently reflected in the MMC.

Configuration Tasks for Active Directory

To enable an SAP system to make use of the features offered by the Active Directory, you must configure both the Active Directory and the SAP system:

1. You prepare the Active Directory so that it can store SAP data.
   This involves extending the schema for the SAP data types, creating a root container for the storage of SAP-specific information, and defining accounts that allow directory access. You perform all these tasks using SAPinst with the option *Configure Active Directory for SAP System*.
   For more information, see *Preparing the Active Directory (Optional)* [page 93].
2. You configure the SAP system to enable interaction with the Active Directory.
   You do this during the central instance installation using the SAPinst tool. SAPinst prompts you for information about the Active Directory and then configures the system accordingly.

Configuration Tasks for Generic LDAP Directories

To prepare the SAP system to use generic LDAP services, you must perform several steps to configure both the LDAP directory and the SAP system:

1. You configure the LDAP directory to store SAP data.
   This involves extending the directory schema and creating a container for the SAP data.
2. You configure the SAP system to enable interaction with the LDAP directory.
   You do this during the central instance installation using the SAPinst tool. SAPinst prompts you for information about the Active Directory and then configures the system accordingly.
3. You set up a user with a password on the server where the SAP system is running to permit the system to access and modify the LDAP directory.
   You do this by running the script `ldappasswd`.

For more information on how to enable interaction between a generic LDAP directory and the SAP system, see the documentation *SAP System Information in Directory Services* in the SAP Service Marketplace at `service.sap.com/msplatforms` ® *Microsoft* ® *Windows Server*

More Information

   Preparing the Active Directory [page 93]

6.3 Preparing the Active Directory (Optional)

If you decided to use LDAP directory services, you need to prepare the Active Directory. The SAP system can then use the Active Directory to store and access data.

   To prepare the directory, you use SAPinst to automatically:

■ Extend the Active Directory schema to include the SAP-specific data types
■ Create the domain accounts required to enable the SAP system to access and modify the Active Directory.
   These are the group `SAP_LDAP` and the user `sapldap`.

■ Create the root container where information related to SAP is stored
■ Control access to the container for SAP data by giving members of the `SAP_LDAP` group permission to read and write to the directory

> **Note**
>
> For more information on how to set up a Netscape / iPlanet directory server, see the documentation *SAP System Information in Directory Services* on SAP Service Marketplace at `service.sap.com/msplatforms`® *Microsoft* ® *Windows Server*

Prerequisites

A Windows domain controller with an Active Directory is installed on the network.

Procedure

1. Log on as user with domain administrators rights.
2. Run SAPinst and choose *<SAP System>* ® *Additional Software Life-Cycle Tasks* ® *Additional Preparation Tasks* ® *Active Directory Configuration*.
3. Follow the instructions in the SAPinst dialogs and enter the required parameters.

> **Note**
>
> ■ When you are prompted for the password of the `sapldap` user, and this user does not yet exist, make sure that the password consists of at least 5 characters.
> ■ For more information about the input parameters, position the cursor in the field of the respective parameter and press the `F1` key.

When you have made these entries, SAPinst extends the Active Directory schema for the SAP system.

6.4 Preparing User Management for an External ABAP System

For a Java system, you can also deploy user management for an external ABAP system. In this case, you configure the User Management Engine (UME) of the J2EE Engine for the user management of a separate ABAP system.

If you want to connect more than one Java system to the same ABAP system, you need to work out a concept for the communication, administrator, and guest users for each engine.

You can take one of the following approaches:

Approach	Advantages	Disadvantages
Each Java system uses different users	No interdependencies between the connected engines	Initially more administration to create the users in the ABAP system
All Java systems use the same configuration	You create the users only once and enter the same information for every Java system that you install.	Interdependencies between the connected engines: ■ If you change the password of any of the users on the ABAP system, this change affects **all** connected engines. ■ If you change the administrator user's password, you must also change the password in secure storage on **all** of the connected J2EE Engines

Recommendation

For security reasons, we recommend the first approach.

The procedures below assume that you are using the first approach.

Prerequisites

■ The ABAP system is based on at least SAP Web AS ABAP release 6.20 SP25.
■ In transaction PFCG, check that the roles `SAP_BC_JSF_COMMUNICATION` and `SAP_BC_JSF_COMMUNICATION_RO` exist and make sure that their profiles are generated.
■ In transaction PFCG, check that the roles `SAP_J2EE_ADMIN`, `SAP_J2EE_GUEST` and `SAP_BC_FP_ICF` exist. Neither role contains any ABAP permissions, so you do not need to generate any profiles.
■ In transaction PFCG, create a role named `ADSCallers`. You do not need to maintain authorization data or generate any profiles for that role.
■ For more information, see:
  `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Security* ® *Identity Management* ® *User Management Engine*

Note

For more information about role maintenance, see the SAP Library at
  `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Security* ® *Identity Management* ® *Users and Roles (BC-SEC-USR)* ® *SAP Authorization Concept* ® *Organizing Authorization Administration* ® *Organization if You Are Using the Profile Generator* ® *Role Maintenance* ® *Role Maintenance Functions* ® *Changing Standard Roles*

Administration of the ABAP system

Perform the following administration steps in the **ABAP** system:

1. In transaction SU01 create a new communication user and assign it to the role `SAP_BC_JSF_COMMUNICATION_RO`.

Recommendation

We recommend that you assign this user the role `SAP_BC_JSF_COMMUNICATION_RO` for read-only (display) access to user data with Java tools. If you intend to maintain user data (that is, to change, create, or delete users) with Java tools, you need to assign the role `SAP_BC_JSF_COMMUNICATION` instead. We recommend that you name the user `SAPJSF_<SAPSID_Java_System>`.

You can use any password.

In addition, to make sure that this user can only be used for communication connections between systems and not as a dialog user, assign it the type *Communications* under *Logon data*.

2. In transaction SU01 create a new dialog user and assign it to role `SAP_J2EE_ADMIN`. This is your administrator user in the J2EE Engine.

Recommendation

We recommend that you name the user `J2EE_ADM_<SAPSID_Java_System>`. You can use any password.

Caution

Log on to the SAP system once with this user to change its initial password. Because the installer of the J2EE Engine verifies this password, the installation fails if this password is initial

3. In transaction SU01 create a new dialog user and assign it to role `SAP_J2EE_GUEST`. This is your guest user in the J2EE Engine.

Recommendation

We recommend that you name the user `J2EE_GST_<SAPSID_Java_System>`. You can use any password. As this user is only used for anonymous access to the system, we recommend you to deactivate the password and, if required, lock it after installation to prevent anyone from using it for explicit named logons.

4. In transaction SU01 create the following dialog users :

Caution

You must have *changed the initial passwords* [page <u>81</u>] of these users **before** you start the installation of the Java system.

- Users for Adobe Document Services (ADS) (optional):
  - `ADSUSER`:
    In transaction PFCG, assign the role `ADSCallers` to this user.
  - `ADS_AGENT`:
    In transaction PFCG, assign the role `SAP_BC_FP_ICF` to this user.
- SLD Data supplier user (optional):
  You only have to create this user if you want to install SAP System Landscape Directory (SLD). The SLD data supplier user name that you enter later on during the Java system installation must be identical to this user.

> ⬆ Recommendation
>
> We recommend that you name this user SLDDSUSER

- SLD ABAP API user (optional):
  You only have to create this user if you want to install SAP System Landscape Directory (SLD). The SLD ABAP API user name that you enter later on during the Java system installation must be identical to this user.

  > ⬆ Recommendation
  >
  > We recommend that you name this user SLDAPIUSER

Installation of the Java system

Perform the following steps in the **Java** system:

1. **Before** the installation of the Java system, make sure that you have the correct user names and passwords of the users listed above for the separate ABAP system.
2. **During** the installation of the Java system, make sure that you enter the correct users and passwords in the corresponding SAPinst dialogs.

6.5 Creating a User for LDAP Directory Access (Optional)

If you use LDAP directory services, you have to set up a user with a password on the machine where the SAP system is running. This permits the SAP system to access and modify the LDAP directory.

For more information, see *Integration of LDAP Directory Services* and *Preparing the Active Directory*.

Prerequisites

During the SAP instance installation you chose to configure the SAP system to integrate LDAP services.

Procedure

1. Log on as user `<sapsid>adm`.
2. Enter:

   `ldappasswd pf=<path_and_name_of_instance_profile>`
3. Enter the required data.

> **Example**
>
> The following is an example of an entry to create an *LDAP Directory User*:
>
> `CN=sapldap,CN=Users,DC=nt5,DC=sap-ag,DC=de`

6.6 Configuring User Management to Use an LDAP Directory (Optional)

If your user data source is an LDAP directory, you need to configure the connection to the LDAP directory after installation.

For more information, see:

`help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Security* ® *Identity Management* ® *User Management Engine* ® *UME Configuration* ® *Configuring UME to Use an LDAP Server as Data Source*

6.7 Entries in the Services File Created by SAPinst

After the installation has finished successfully, SAPinst has created the following entries for port names in `<drive:>\WINDOWS\system32\drivers\etc\services`:

```
sapdpXX = 32XX/tcp
sapdbXXs = 47XX/tcp
sapgwXX = 33XX/tcp
sapgwXXs = 48XX/tcp
```

where XX is set from 00 to 99.

> **Note**
>
> If there is more than one entry for the same port number, this is **not** an error.

6.8 Usage Type-Specific Initial Technical Configuration

SAPinst performs initial technical configuration steps for the usage types shown below during the installation.

However, you might have to perform some of these steps manually after SAPinst has finished, depending on your installation scenario.

For more information, see the following usage type-specific sections:

- *Application Server Java (AS Java)* [page 99]
  - *Adobe Document Services (ADS)* [page 99]
  - *Composite Application Framework (CAF)* [page 105]
  - *Connection to System Landscape Directory (SLD)* [page 106]
- *Enterprise Portal (EP)* [page 106]
- *Business Intelligence (BI Java)* [page 107]

6.8.1 Initial Technical Configuration for Application Server Java (AS Java)

SAPinst performs initial technical configuration steps for the AS Java functional units listed below during the installation.

However, you might have to perform some of these steps manually after SAPinst has finished, depending on your installation scenario.

For more information, see the following functional unit-specific sections:

■ *Adobe Document Services (ADS)* [page 99]
■ *Composite Application Framework (CAF)* [page 105]
■ *Connection to System Landscape Directory (SLD)* [page 106]

6.8.1.1 Initial Technical Configuration for Adobe Document Services

SAPinst automatically performs initial technical configuration steps specific to Adobe Document Services (ADS) during the installation.

However, you have to perform some of these steps manually if:

■ You upgraded your SAP system to NetWeaver 2004s SR1.
■ You have installed AS Java on a separate host and want to use ADS for a standalone ABAP system.
■ You want to change existing parameters or you want to set additional parameters.

The following steps might be affected:

■ *Check the IIOP service* [page 100]
■ *Check the Java startup properties* [page 100]
■ *Create a user for basic authentication* [page 100]
■ *Create a service user in the ABAP environment* [page 102]
■ *Create a WebService destination* [page 103]
■ *Create an HTTP destination* [page 103]
■ *Create the ADS connection in ABAP* [page 104]
■ *Activate the ICF cervice FP* [page 105]

For further configuration information, see the Adobe Document Services Configuration Guide, which you can find:

■ On SAP Service Marketplace at:
   `service.sap.com/adobe` ® *Interactive Forms Based on Adobe Software* ® *Media Library* ® *Documentation* ® *Adobe Document Services - Configuration Guide NW 2004s*
■ In the SAP Library at:
   `help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Technology Consultant's Guide* ® *Additional Cross-NetWeaver Configurations* ® *Adobe Document Services - Configuration*.

6.8.1.1.1 Checking the IIOP Service

The startup mode of the service iiop must be set to always. To verify this, you have to check and if required modify special settings on the central instance host.

Procedure

1. Start the configuration tool of the J2EE engine:
   Run \usr\sap\<SAPSID>\DVEBMGS<xx>\j2ee\configtool.bat
   Run \usr\sap\<SAPSID>\JC<xx>\j2ee\configtool.bat
   The *J2EE Engine − Config Tool* screen appears.
2. In the left frame, open the tree *Cluster data* ® *Global dispatcher configuration* ® *Services*.
3. Choose service *iiop*.
4. The field *Startup mode* in the right frame must be set to **always**.
5. Choose *Apply changes*.
6. Repeat the steps 2. − 5. for the following path: *Cluster data* ® *Global server configuration* ® *Services*.

6.8.1.1.2 Checking Java Startup Properties

You have to check if the Java startup property for Adobe document services is set. To do so, you have to check and if required modify special settings on the central instance host.

Procedure

1. Start the configuration tool of the J2EE engine:
   Run \usr\sap\<SAPSID>\DVEBMGS<xx>\j2ee\configtool.bat
   Run \usr\sap\<SAPSID>\JC<xx>\j2ee\configtool.bat
   The *J2EE Engine − Config Tool* screen appears.
2. Select *cluster data* ® *instance_<IDxxxx>* ® *server_<IDxxxx>*.
3. In the right frame, check if the following line exists in the section *Java Parameters* of the tab *General*:
   -Dorg.omg.PortableInterceptor.ORBInitializerClass.com.sap.engine.
   services.ts.jts.ots.PortableInterceptor.JTSInitializer
   If it is not true, add the line to this section.

6.8.1.1.3 Creating a User for Basic Authentication

To ensure secure access, you must create a user and assign the security role ADSCaller to this user . The ADSCaller security role was created during the SAP system installation.

⚠️ Caution

Do not assign this security role to users other than the system user that you will use for accessing Adobe document services.

You can create this user in the J2EE Engine or in the SAP NetWeaver usage type AS ABAP depending on the J2EE installation settings for the SAP User Management Engine (UME). You create this user in the usage type AS ABAP when the UME is configured against the SAP NetWeaver usage type AS ABAP back-end. In this case you also have to create a role `ADSCallers` in the usage type AS ABAP and assign the user `ADSUser` to this role.

Procedure

Creating a User in AS Java

1. Log on to the Visual Administrator of the J2EE Engine.
   a) On your central instance host, change to the `admin` directory:
      (path: `\usr\sap\<SAPSID>\<instance_number>\j2ee\admin`):
   b) Double-click `go.bat`.
2. On the *Cluster* tab, choose *Server <x>* ® *Services* ® *Security Provider*.
3. On the *User Management* tab, choose *Create Group* to create a group called `ADSCallers`, if the group does not exist. In the dialog box that follows, enter the name and choose *OK*.
4. Choose *Create User*.
   The *Create New User* dialog box is displayed.
5. In the *User name*, *Password*, and *Confirm password* boxes, enter `ADSUser` for the user name and enter a password.
6. Choose the *Tree* tab in the right panel. In the *User Tree*, select `ADSCallers`, and then choose *OK*.
7. Choose the *Tree* tab in the left panel. Select *ADSCallers* ® *ADSUser*.
8. In the *Authentication* area, select *No password change required*.
9. On the *Policy Configurations* tab, in the *Components* area, select
   `com.adobe/AdobeDocumentServices*AdobeDocumentServicesAssembly.jar`.
10. On the *Security Roles* tab, select `ADSCaller` from the *Security Roles* list.
11. In the *Mappings* area, choose *Add*, which is assigned to *Users*.
    The dialog *Choose Users or Groups* is displayed.
12. Choose the *Tree* tab.
13. In the *User Tree*, under the *ADSCallers* group, select the *ADSUser* that you just created and choose *OK*.
    This assigns the new user to the ADSCaller security role.

Creating a User in AS ABAP

1. Log on to the SAP system with an admin user, in the client that is used for the UME authentication.
2. Choose *Tools* ® *Administration* ® *User Maintenance* ® *User* (transaction `SU01`).
3. Enter `ADSUser` as user name and choose *Create*.
4. Choose *system user* as type for ADSUser.
5. Choose *Tools* ® *Administration* ® *User Maintenance* ® *Role Administration* ® *Roles* (transaction `PFCG`).
6. Create a role `ADSCallers` (no authorizations required).
7. Activate the role.
8. Assign the user `ADSUser` to this role.

9. Log on to the Visual Administrator of the J2EE Engine.
   a) On your central instance host, change to the `admin` directory:

      (path: `/usr/sap/<SAPSID>/<instance_number>/j2ee/admin`):

      (path: `\usr\sap\<SAPSID>\<instance_number>\j2ee\admin`):
   b) Run `go.sh`.
   c) Double-click `go.bat`.
10. On the *Cluster* tab, choose *Server <x>* ® *Services* ® *Security Provider*.
11. On the *User Management* tab, choose the *Tree* tab in the left panel.
12. In the *User Tree*, ensure that the user you created in ABAP appears under the *ADSCallers* group.
13. On the *Policy Configurations* tab, in the *Components* area, select
    `com.adobe/AdobeDocumentServices*AdobeDocumentServicesAssembly.jar`.
14. On the *Security Roles* tab, select *ADSCAller* from the Security Roles list.
15. In the *Mappings* area, choose *Add*, which is assigned to *Users*.
    The dialog *Choose Users or Groups* is displayed.
16. Choose the *Tree* tab.
17. In the *User Tree*, under the *ADSCallers* group, select the *ADSUser* you just created and choose *OK*.
    This assigns the new user to the ADSCaller security role.

6.8.1.1.4 Creating a Service User in the ABAP Environment

You need to create the service user `ADS_AGENT` for processing forms between an ABAP and a Java environment.

Procedure

1. Log on to the ABAP client specified in the profile parameter `login/system_client`.
2. Choose transaction SU01 (*User Management*).
3. Enter the name **ADS_AGENT** in the *User* field and choose *User* ® *Create*.
4. Choose the *Logon data* tab and assign a password.
5. Choose *Service* as the user type for `ADS_AGENT`.
6. Choose the *Role* tab and assign the role `SAP_BC_FP_ICF` to the user `ADS_AGENT`.

   > **Note**
   > You can copy the role `SAP_BC_FP_ICF` first. For more information, see:
   > help.sap.com/nw2004s ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Security* ®
   > *Identity Management* ® *Users and Roles (BC-SEC-USR)* ® *SAP Authorization Concept* ® *Organizing Authorization*
   > *Administration* ® *Organization if You Are Using the Profile Generator* ® *Role Maintenance* ® *Role Maintenance*
   > *Functions* ® *Changing Standard Roles*

7. Save your settings.

6.8.1.1.5 Creating a Web Service Destination

Here you find information how to create a Web Service Destination.

Procedure

1. Log on to the Visual Administrator of the J2EE engine:
   a) On your central instance host, change to the `admin` directory:
      (path: `\usr\sap\<SAPSID>\<instance_number>\j2ee\admin`):
   b) Double-click `go.bat`.
2. On the *Cluster* tab, choose *Server <x>* ® *Services* ® *Web Services Security*.
3. Choose *Web Service Clients* ® *sap.com > tc~wd~pdfobject* ®
   *com.sap.tc.webdynpro.adsproxy.AdsProxy*ConfigPort_Document*.
4. From the *Authentication* list, select *BASIC*.
5. In the *User* and *Password* boxes, enter as user name **ADSUser** and a password.
6. Choose *Save*.
7. Activate the authentication data as follows: Navigate to *Services* ® *Deploy*.
8. Choose the button *Application*.
9. Choose *sap.com/tc~wd~pdfobject* in the tree.
10. Choose *Stop Application*.
11. For restarting the application, choose *Start Application*.

💡 Note

If the Adobe document services and the Web Dynpro runtime environment are not installed on the same J2EE Engine, you have to configure a *Custom* URL. For more information, see:

`help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *SAP NetWeaver by Key Capability* ® *Application Platform by Key Capability* ® *Java Technology* ® *Administration Manual* ® *Administration/Configuration of Web Dynpro Runtime Environment* ® *Web Dynpro-Specific URL Parameters* ® *Configuring the Web Dynpro Runtime Environment*.

6.8.1.1.6 Creating a HTTP Destination

You have to create a HTTP destination to the back-end where the Adobe document services are installed.

Procedure

1. Start the Visual Administrator of the J2EE Engine.
   a) On your central instance host, change to the `admin` directory:
      (path: `\usr\sap\<SAPSID>\<instance_number>\j2ee\admin`):
   b) Double-click `go.bat`.
2. On the *Cluster* tab, choose *Server <x>* ® *Services* ® *Destinations*. Under *Runtime*, select *HTTP*. The available destinations are displayed. The information that applies to a selected destination is displayed in the right pane.
3. Choose *New* in the navigation panel.

4. In the dialog box that follows, enter the name **FP_ICF_DATA_<SID>** (where <SID> specifies the back-end where the Adobe document services are installed) for the new destination and choose *OK*.

5. As the target URL, enter the message server (or Web Dispatcher) of the SAP NetWeaver AS ABAP in the URL field:

    http://<hostname>:<HTTP_port>

    and in case of SSL:

    https://<hostname>:<HTTPS_port>

    > 💡 Note
    >
    > To display the host name of your SAP NetWeaver AS ABAP, log on your ABAP system and call transaction SICF. In the main menu, choose *Go to* ® *Port Information*. The information is displayed on a screen. The HTTP_port is specified under *Services*.

6. Select the authentication method to use for the connection, and enter the parameters for the authentication method in the corresponding fields (if applicable).
    - In the *Username* field, enter **ADS_AGENT** (must exist as service user in usage type AS ABAP).
    - In the *Password* field, enter the same password as given for the AS ABAP service user ADS_AGENT.

7. If the connection is to use HTTPS, specify how the connection should handle SSL server authentication.

8. Save your settings.

6.8.1.1.7 Creating the ADS Connection in ABAP

You use this procedure to create a connection in the ABAP environment to use when connecting to Adobe document services.

> 💡 Note
>
> This procedure applies only in the scenario of print forms and if you have installed Adobe document services on a Java Add-In system.

Procedure

1. Log on to the central instance host.
2. Call transaction SM59.
3. Choose *Create*.
4. Enter at least the following:
    - RFC destination: **ADS**
    - Connection type: **G**
    - Description: **<your description>**
5. Choose ENTER .
6. Choose the *Technical settings* tab and enter at least the following:
    - *Target host*:
      Enter the host name where you J2EE engine is located or the host name of the Windows dialog instance.
    - *Service No.*:
      - Enter the J2EE HTTP port number.

The following naming convention applies:

5<J2EE_instance_number>00 (50000 for example, if your J2EE instance is 00).

- **Or** enter the port number of the Windows dialog instance.

■ *Path prefix*:

Enter exactly the string **/AdobeDocumentServices/Config?style=rpc** or, if you want to set up SSL,

/AdobeDocumentServicesSec/Config?style=rpc

> **Note**
>
> A warning is displayed: Query String Not Allowed. Ignore this warning by pressing ENTER.

7. Choose the *Logon/Security* tab and configure the security account to your security requirements.
8. Save your settings.
9. Choose *Test Connection*.
   A screen is displayed. The field *status_reason: OK* indicates that the test was successful.

6.8.1.1.8 Activating the ICF Service FP

The communication between the Destination Service of the SAP NetWeaver AS Java and AS ABAP uses the
Internet Communication Framework (ICF). You have to activate the corresponding service.

Procedure

1. Choose transaction SICF.
2. Choose *default_host* ® *sap* ® *bc* ® *fp* in the tree.
3. Choose *Service/Virt.Host* ® *Activate*.

The ICF service is now active.

6.8.1.2 Initial Technical Configuration for Composite Application Framework Core

SAPinst automatically performs initial technical configuration steps specific to the Composite Application
Framework Core (CAF) during the installation.

■ However, you have to perform some of these steps manually if:
   You upgraded your SAP system to NetWeaver 2004s SR1
■ You want to change existing parameters or you want to set additional parameters.

The following steps might be affected:

■ Create roles CAFAdmin and CAFUIAdmin
■ Set configuration parameters

If you want to change existing parameters or if you want to set additional parameters, you have to perform
these steps manually, as described here:

`help.sap.com/nw2004s` ® *SAP NetWeaver Library* ® *Technology Consultant's Guide* ® *Developing, Configuring, and Adapting Applications* ® *Creating Composite Applications* ® *Composite Application Framework Core Configuration Guide*

6.8.1.3 Configuring the Connection for System Landscape Directory

SAPinst automatically configures the connection for System Landscape Directory according to the parameters you entered on the related SAPinst screens during the input phase.

However, you have to perform some of these steps manually if:

- You upgraded your SAP system to NetWeaver 2004s SR1
- You want to change existing parameters or if you want to set additional parameters.

This section provides information on how to configure your SAP system for System Landscape Directory (SLD).

You can now configure your SAP System for SLD as follows:

- As an **SLD server** (and client)
- As an **SLD client**

For more information, see:

Configuration of Data Suppliers in the documentation *Post Installation Guide — System Landscape Directory SAP NetWeaver 2004s* on SAP Service Marketplace at `service.sap.com/installNW2004s`.

Configuration of Data Suppliers in the documentation *Post Installation Guide — System Landscape Directory SAP NetWeaver 2004s* on SAP Service Marketplace at `service.sap.com/installNW2004s`.

Only valid for: Enterprise Portal (EP)

6.8.2 Initial Technical Configuration for Enterprise Portal (EP)

SAPinst automatically performs EP-specific initial technical configuration steps during the installation.

However, you might have to perform some of these steps manually if:

- You upgraded your SAP system to NetWeaver 2004s SR1.
- You have installed usage type EP as an additional usage type to an existing SAP system as described in **SAP Note** 883948.

The following steps might be affected:

- Copying `CMS_MAPPING` Properties
- Renaming `InitialPermissions.xml.template`
- Renaming `initialPermissionsKMC.xml.template`

Copying CMS_MAPPING Properties

Copy file `cms_mapping.properties` from source directory

    `<drive:>\usr\sap\<sid>\JCxx\j2ee\cluster\server<x>\apps\sap.com\irj\`

    `servlet_jsp\irj\root\WEB-INF\portal\system\pcd\Migration\mapping\`

    to target directory

    `<drive:>\usr\sap\<sid>\SYS\global\pcd\Migration\mapping\.`

> **Note**
> If the target directory does not exist, you have to create it as well.

Renaming InitialPermissions.xml.template

1. Go to directory
   `<drive:>\usr\sap\<sid>\JCxx\j2ee\cluster\server<x>\apps\sap.com\irj\.servlet_jsp\irj\root\WEB-INF\portal\system\xml\acl`
2. Rename file `initialPermissions.xml.template` to **`initialPermissions.xml`**.

Renaming initialPermissionsKMC.xml.template

1. Go to directory
   `<drive:>\usr\sap\<sid>\JCxx\j2ee\cluster\server<x>\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\portal\system\xml\acl`
2. Rename file `initialPermissionsKMC.xml.template` to **`initialPermissionsKMC.xml`**.

End of: Enterprise Portal (EP)

Only valid for: BI Java Components (BI-Java)

6.8.3 Initial Technical Configuration for Business Information Java (BI Java)

SAPinst automatically performs BI Java-specific initial technical configuration steps during the installation.
   However, you might have to perform some of these steps manually if:

■ You upgraded your SAP system to NetWeaver 2004s SR1.
■ You have installed usage type BI Java as an additional usage type to an existing SAP system as described in **SAP Note** 883948.

The following steps might be affected:

■ *Configure BI Java Information Broadcasting* [page 107]
■ *Process Chains: Transport texts for alert category* [page 108]
■ *Rename initialPermissionsBI.xml.template* [page 108]
■ *Run the configuration template installer for usage type BI Java* [page 85]

6.8.3.1 Configuring BI Java Information Broadcasting

For the configuration of the BI Information Broadcasting you need to carry out the following steps in your ABAP system:

1. Call transaction SPRO and carry out the following steps:
   a) **Settings for Information Broadcasting:**
      Go to *SAP NetWeaver* ® *Business Intelligence* ® *Reporting-relevant Settings* ® *Settings for Information Broadcasting*
   b) **Destinations for Web Dynpro ALV:**

Go to *SAP NetWeaver*® *Application Server*® *Web Dynpro for ABAP*® *Set-Up Printing for Web Dynpro ABAP ALV*
- Create RFC destination in the SAP NetWeaver Portal
- Create RFC destination to the SAP NetWeaver Portal
- Set-Up Web Service destination for the Adobe Document Services

2. **Installation of BI Content:**

Call transaction RSTCO_ADMIN to check whether the installation has been carried out successfully. If the installation status is red, restart the installation by calling transaction RSTCO_ADMIN again. Check the installation log if you need further assistance or information.

For more information, see **SAP Note** 834280.

> **Note**
>
> For the installation of SAP NetWeaver 2004s BI Content Add-On 2 or higher on the AS ABAP system, see **SAP Note** 847019.

6.8.3.2 Process Chains: Transporting Texts for the Alert Category

Alerts can be triggered and sent for BI process chains that contain errors. Defining the alert categories is necessary for this purpose. Alert category BWAC_PROCESS_CHAIN_FRAMEWORK is returned for errors in background processing of process chains. This category has set texts that are not transported when the alert category is transported.

Procedure

See **SAP Note** 601619 to manually transport the texts.

6.8.3.3 Renaming initialPermissionsBI.xml.template

If SAPinst does not rename the initialPermissionsBI.xml.template file automatically, you will need to rename it yourself.

Procedure

1. Go to directory
   ```
   <drive:>\usr\sap\<sid>\JCxx\j2ee\cluster\server<x>\apps\sap.com\irj\
   servlet_jsp\irj\root\WEB-INF\portal\system\xml\acl
   ```
2. Rename file initialPermissionsBI.xml.template to **initialPermissionsBI.xml**.

| End of: BI Java Components (BI-Java) |

6.9 Deleting an SAP System

The following sections describe how to delete a single instance, a standalone engine or a complete SAP system with SAPinst.

To delete your system, you use the SAPinst service *<SAP System> ® Additional Software Life-Cycle Tasks ®*
Uninstall ®   Uninstall System / Standalone Engine / Optional Standalone Unit.

> **Note**
>
> This description assumes that you have installed your SAP system with standard SAP tools according to
> the installation documentation.

> **Caution**
>
> ■ Make sure that all remaining instances are stopped before you delete the database instance.
> ■ You cannot delete an SAP system remotely.
> ■ SAPinst deletes the database instance but you have to delete the database software manually.
> ■ If you delete network-wide users, groups or service entries in an environment with Network
>   Information System (NIS), other SAP installations might also be affected. Make sure that the users,
>   groups, and service entries to be deleted are no longer required.

Process Flow

> ■ **Note**
>
>   SAPinst deletes the database instance but you have to *delete the Oracle database software* [page 111] manually.

■ If you want to delete a **distributed** system, where the SAP instances reside on different hosts, you have to
  run SAPinst [page 109] to delete the required instances **locally** on each host in the following sequence:
  1. You delete the dialog instance(s), if there are any.
  2. You delete the database instance.
  3. You delete the central instance.
  4. You delete the central services instance.
  5. You *delete the Oracle database software* [page 111].

6.9.1 Running SAPinst to Delete an SAP System

This procedure tells you how to run the *Uninstall* service of SAPinst.

Prerequisites

You are logged on as a user with the required rights and privileges to run the SAPinst tool and the SAP system.
For more information, see *Granting User Rights for the Installation* [page 32].

Procedure

1. Start SAPinst and on the *Welcome* screen, choose:
   *<SAP System> ®   Additional Software Life-Cycle Tasks ®   Uninstall ®   Uninstall System / Standalone Engine / Optional
   Standalone Unit*.

> **Note**
>
> With this SAPinst service you do **not** delete the database software.

2. Follow the instructions in the SAPinst input dialogs.

   > **Note**
   >
   > For more information about the input parameters, place the cursor on the relevant field and press
   > `F1` in SAPinst.

   SAPinst first asks you which SAP instances you want to delete.

   Make sure that you delete the SAP instances in the correct order, as described in *Deleting an SAP System*
   [page 108].

   > ⚠ **Caution**
   >
   > ■ SAPinst only stops **local** instances automatically.
   >
   >   Before you delete the database instance of a distributed system make sure that you stop all
   >   remaining instances. You must stop the instance with the message server only after having entered
   >   all SAPinst parameters for the deletion of the database instance.
   >
   > ■ If SAPinst stops responding while trying to delete the central instance, close SAPinst with *Cancel*
   >   and *Exit*. Log off and log on again. Restart SAPinst to complete the uninstall process of the central
   >   instance.

3. Use the following options to delete the database instance and schema.

Options	Remarks
Drop database	Select this option if you want to delete the database instance, including all database schemas, all tablespaces and their corresponding data files. The database software will not be deleted.
Select schemas and tablespaces to drop only	Select this option only if you use **MCOD** and you want to delete the selected database schema and the selected tablespaces. The database instance and the database software will not be deleted.

Options	Remarks
	⚠️ Caution Before deleting any database schema, make sure that: ■ You have performed a recent offline database backup. ■ You have stopped or deleted all SAP instances belonging to this database schema. ■ If you have installed a Java system, you have stopped the J2EE Engine with transaction SMICM. ■ You only delete the tablespaces that belong to the selected schema. The Java schema `SAP<SAPSID>DB`default belongs to the database tablesspace `PSAP<SAPSID<DB`. All other SAP tablespaces belong to the ABAP schema `SAP <SAPSID>` or `SAPR3`
Keep database and its content	Select this option if you only want to delete the previously selected SAP instance(s). With this option, you do **not** delete the database instance, database content or the database software.

4. Delete the local user group `SAP_<SAPSID>_LocalAdmin` manually as follows:
    a) Choose *Start* ® *Programs* ® *Administrative Tools* ® *Computer Management*
    b) Choose *Local Users and Groups* ® *Groups.*
    c) Right-click the local group `SAP_<SAPSID>_LocalAdmin` and choose *Delete.*
5. *Delete the Oracle database software* [page <u>111</u>].

6.9.2 Deleting the Oracle Database Software

You use the Oracle Universal Installer to delete the Oracle database software.

Prerequisites

Before you delete the database software, make sure that you delete the groups `ORA_<DBSID>_DBA` and `ORA_<DBSID>_OPER` as follows:

1. Choose *Start* ® *Programs* ® *Administrative Tools* ® *Computer Management*
2. Choose *Local Users and Groups* ® *Groups.*
3. Select and delete the local groups `ORA_<DBSID>_DBA` and `ORA_<DBSID>_OPER` with *Action* ® *Delete.*

Procedure

> 💡 Note
>
> The Oracle software is installed on all hosts where an SAP instance is running, for example, on a central instance host, database host, or dialog instance host. Do **not** delete the Oracle database software, if another SAP instance is running on the same host.

Only valid for: HA (MSCS)

> ⚠ Caution
>
> ■ Deinstall the Oracle Fail Safe (OFS) software with Oracle Universal Installer before deleting the Oracle database software.
> ■ Delete the Oracle database software on both nodes.

End of: HA (MSCS)

1. Stop all Oracle Services and the *Microsoft Distributed Transaction Coordinator*.
   To access the services choose *Start* ® *Programs* ® *Administrative Tools* ® *Services*.
   Select a service and then choose *Action* ® *All Tasks* ® *Stop*.
2. Delete the Oracle database software with the Oracle Universal Installer as follows:
   a) Start the Oracle Universal Installer under *Start* ® *Programs* ® *Oracle Installation Products* ® *Universal Installer*.
   b) Choose *Installed Products* or *Deinstall Products*.
   c) Select the database product (`<DBSID>_101_32` or `<DBSID>_101_64`) you want to uninstall.
   d) Select the Oracle 10G database and choose *Remove*.
   e) Confirm with *Yes* and choose *EXIT*.
3. Delete the Oracle home directory and all its subdirectories under `<DRIVE>:\ORACLE_HOME`.
4. Edit the Oracle Registry entries as follows:
   a) Choose *Start* ® *Run* and enter **REGEDIT**.
   b) Delete the key *HKEY_LOCAL_MACHINE* ® *SOFTWARE* ® *ORACLE*.
   c) Delete all Oracle references under *HKEY_LOCAL_MACHINE* ® *SYSTEM* ® *CURRENTCONTROLSET* ® *SERVICES*.
5. Delete all Oracle references from the Windows user and system environment:
   a) Choose *Start* ® *Programs* ® *System*.
   b) Choose the *Advanced* tab and then click *Environment Variables*.
   c) For example, delete the variables:
      `TNS_ADMIN, NLS_LANG, ORACLE_HOME, ORACLE_<DBSID>`.
   d) Also delete `Oracle` from the `PATH` variable.
6. Delete the Oracle entries from the *Start* menu:
   a) Choose *Start* ® *Settings* ® *Taskbar & Start Menu*.
   b) On the *Advanced* tab, click *Advanced*.
   c) On the *Start Menu* screen, look under
      `All Users\Start Menu\Programs`.
      Select and delete the folders for Oracle with *File* ® *Delete*.
   d) Delete the Oracle shortcut from the desktop.

6.10 SAP System Security on Windows

In a standard SAP system installation, SAPinst automatically performs all steps relevant for security. Although SAPinst makes sure that the system is protected against unauthorized access, you must still check that no security breaches can occur.

For central and straightforward administration of the SAP system, you have to install distributed SAP systems with multiple application servers in a Windows **domain**. This section describes the user accounts and groups that SAPinst creates during a domain installation and shows how these are related to the SAP directories.

User Accounts

SAPinst creates the following accounts for SAP system administration:

- `<sapsid>adm`

  This is the SAP system administrator account that enables interactive administration of the system.

- `SAPService<SID>`

  This is the user account that is required to start the SAP system. It has the local user right to log on as a service.

The advantage of the additional `SAPService<SAPSID>` account is that it does not allow an interactive logon, which prevents abuse of the account. Therefore, you do not need to set an expiration date for the password and you do not have to set the option *user must change password at next logon*.

Groups

SAPinst creates the following groups during a domain installation:

- `SAP_<SAPSID>_GlobalAdmin`

  This global group is a domain-level SAP administration group for organizing SAP system administrators. The only function of a global group is to group users at the domain level so that they can be placed in the appropriate local groups.

- `SAP_<SAPSID>_LocalAdmin`

  Only local groups are created and maintained on an application server. A local group can only be given permissions and rights to the system where it is located. The system is part of a particular domain, and the local group can contain users and global groups from this domain.

- `SAP_LocalAdmin`

  This group is created on all hosts, but is particularly important for the transport host. Members of the group have full control over the transport directory (`\usr\sap\trans`) that allows transports to take place between systems.

  The `SAP_<SAPSID>_GlobalAdmin` groups of all the SAP systems that are part of the transport infrastructure are added to the `SAP_LocalAdmin` group. As a consequence, the users `<sapsid>adm` and `SAPService<SAPSID>` of all systems in the transport infrastructure are members of the `SAP_LocalAdmin` group and have the required authorizations necessary to initiate and execute transports.

SAP Directories

SAPinst protects the SAP directories under `\usr\sap\<SAPSID>` by only granting the group `SAP_<SAPSID>_LocalAdmin` full control over these directories.

The following graphic illustrates the user accounts and groups created by SAPinst in a system infrastructure consisting of two SAP systems.

Figure 7: User Groups and Accounts
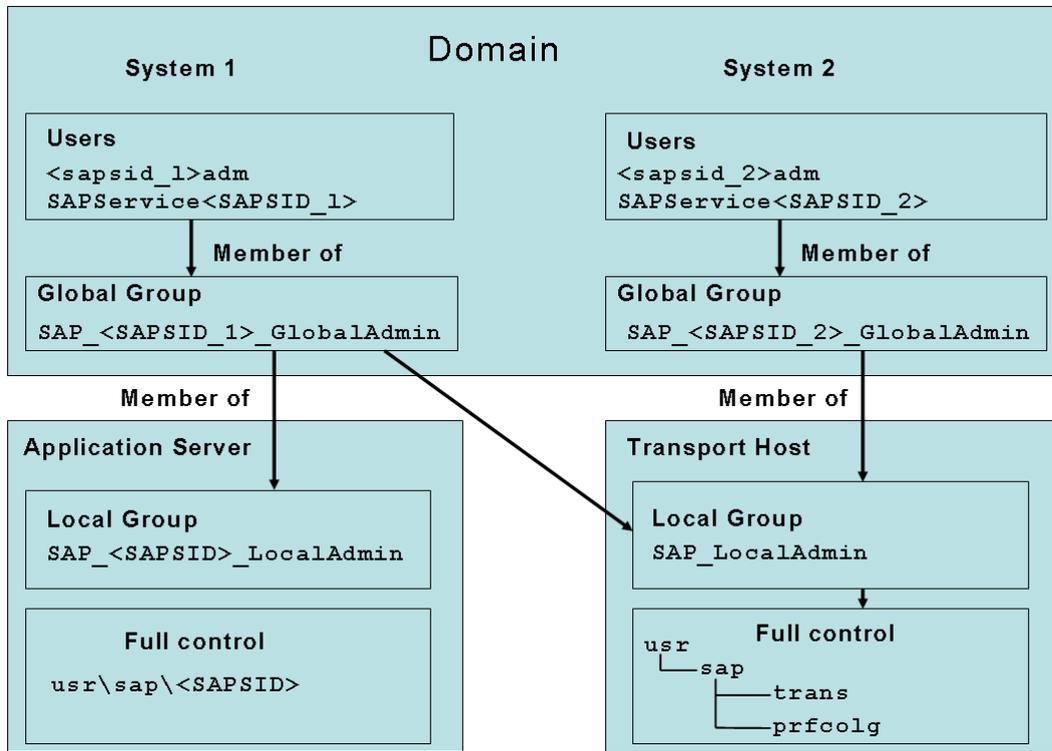
> 💡 Note
>
> An access control list (ACL) controls access to SAP system objects. For maximum security in the SAP system, only the following are members of **all** SAP system object ACLs:
>
> ▪ Local group SAP_<SAPSID>_LocalAdmin
> ▪ Group Administrators
> ▪ Account SYSTEM

6.11 Automatic Creation of Accounts and Groups

SAPinst automatically creates the accounts and groups required for the *secure operation of the SAP system with Windows* [page <u>113</u>] during the installation.

Features

The following graphics show the steps that SAPinst performs to create the users and groups and assign the required rights to SAP directories.

Figure 8: Creating Users and Groups

Creation of Accounts	Creation of SAP domain user accounts
	SAP Administrator `<sapsid>adm` SAP Service Account `SAPService<SAPSID>`

Creation and Modification of Global Group in the Domain	Creation of global group `SAP_<SAPSID>GlobalAdmin`
	Addition of `<sapsid>adm` and `SAPService<SAPSID>` to group `SAP_<SAPSID>_GlobalAdmin`
	Addition of `<sapsid>adm` and `SAPService<SAPSID>` to the local Administrators group
	Addition of `<sapsid>adm` to the Windows domain user groups

Creation and Modification of Local Group on Each Application Server	Creation of the local group `SAP_<SAPSID>_LocalAdmin` on the application server
	Addition of the global `SAP_<SAPSID>_GlobalAdmin` to the local group `SAP_<SAPSID>_LocalAdmin`
	Creation of the local group `SAP_LocalAdmin` on the application server
	Addition of the global group `SAP_<SAPSID>_GlobalAdmin` to the local group `SAP_LocalAdmin` on the application server
	Addition of the `SAP_<SAPSID>_GlobalAdmin` group to the local group `SAP_LocalAdmin` on the transport host

Figure 9: Assigning Rights to SAP Directories
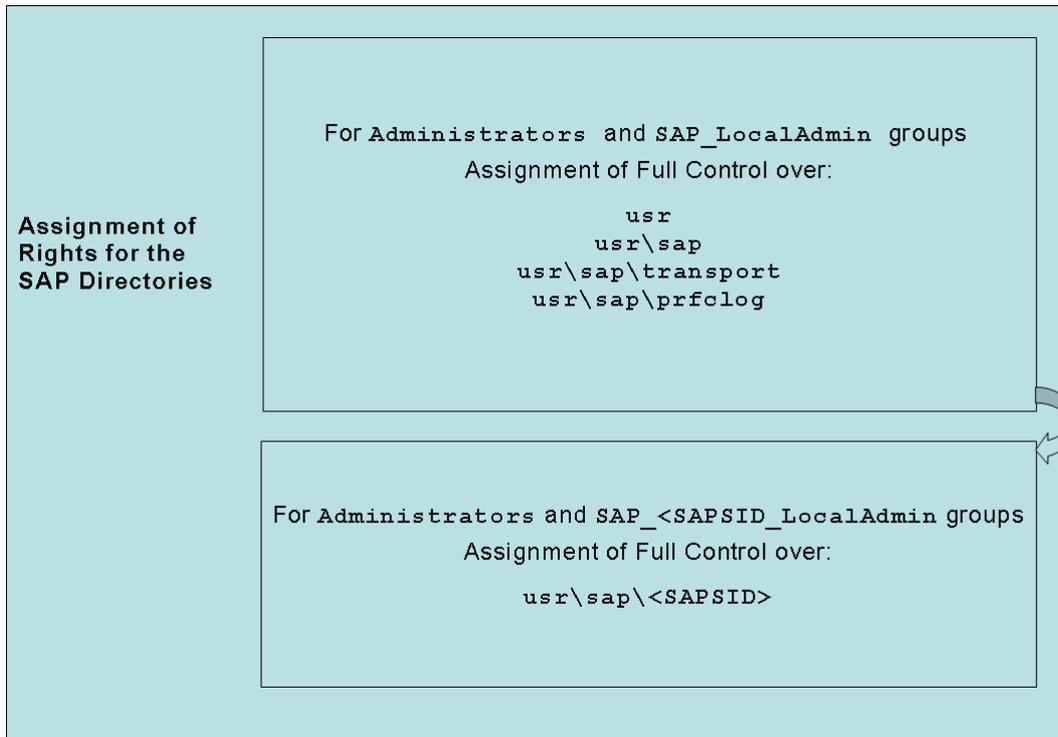
6.12 Manually Granting User Rights for the Installation

Although the rights required for the installation are automatically granted to the user who installs the SAPinst tool, you might need to manually grant user rights for the installation to another user, as described in this section.

Prerequisites

The Windows user that performs the SAP system installation must be authorized to perform the actions necessary for the installation.

For a domain installation, this means that the user must belong to the `Domain Administrator` group and be authorized to:

- Act as part of the operating system
- Adjust memory quotas for a process
- Replace a process-level token

The procedure below assigns these rights to a user of your choice.

⚠ Caution

Be aware that domain policies override locally defined policies. This means that if you want to grant domain administrator rights for a local user, make sure that you have also defined domain administrator rights for this user on domain level.

Procedure

1. Choose *Start* ® *Settings* ® *Control Panel* ® *Administrative Tools* ® *Local Security Policy*.
2. In the *Local Security Settings* window, choose *Local Policies* ® *User Rights Assignment*.
3. Double-click the respective right under *Policy* and choose *Add User or Group*.
4. In the *Select Users and Groups* window, choose the required user and choose *Add*.
   The selected user appears in the box below.
5. Confirm your entry and then repeat the steps for each remaining policy that the user requires for the installation.
6. Log off and log on again to apply the changes.

More Information

Granting User Rights for the Installation [page 32]

6.13 Troubleshooting

The following section(s) describe the steps that you need to perform manually if SAPinst fails:

■ *Troubleshooting with SAPinst* [page 117]

Only valid for: Enterprise Portal (EP)

■ *Troubleshooting for Usage Type Enterprise Portal (EP)* [page 118]

End of: Enterprise Portal (EP)

6.13.1 Troubleshooting with SAPinst

This section tells you how to proceed when errors occur during the installation with SAPinst.
   If an error occurs, SAPinst:

■ Stops the installation
■ Displays a dialog informing you about the error

Procedure

1. To view the log file, choose *View Logs*.
2. If an error occurs during the dialog or processing phase, do either of the following:
   ■ Try to solve the problem
   ■ Abort the installation with *Exit*
      For more information, see *Interrupted Installation with SAPinst* [page 54].
   ■ Continue the installation by choosing *Retry*.

3. Check the log and trace files of the GUI server and SAPinst GUI in the directory `%userprofile%\.sdtgui\` for errors.
4. If SAPinst GUI does not start, check the file `sdtstart.err` in the current `%userprofile%` directory.
5. If SAPinst GUI aborts during the installation without an error message, restart SAPinst GUI as described in *Starting SAPinst GUI Separately*.
6. Ignore error messages in the SDM logs that state that software components are not available. For more information, see **SAP Note** 828978.

Only valid for: Enterprise Portal (EP)

6.13.2 Troubleshooting for Usage Type Enterprise Portal (EP)

If the iViews are not displayed correctly, or if the portal does not launch, the reason may be that the portal was not deployed completely.

Proceed as follows to check the deployment of the portal:

Procedure

1. Open a new console with the user `<System SID>adm`.
2. Go to the directories deployment, pcd, and pcdContent, in the following paths:
   - `<drive>:\usr\sap\<SAPSID>\JC<instance number>\j2ee\cluster\server0\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\deployment`
   - `<drive>:\usr\sap\<SAPSID>\JC<instance number>\j2ee\cluster\server0\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\deployment\pcd`
   - `<drive>:\usr\sap\<SAPSID>\JC<instance number>\j2ee\cluster\server0\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\deployment\pcdContent`
   - `<drive>:\usr\sap\<SAPSID>\JC<instance number>\j2ee\cluster\server0\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\deployment\pcdContent\no_overwrite`
3. Look for files with the extension `*.err`.
4. Do one of the following:
   - If error and log files do not appear, the portal installation has been completed successfully and you can continue.
   - Rename the `*.err` files:
     a) Remove the `err` extension; so the extensions of the files become `*.ept` or `*.par`.
     b) Restart the J2EE Engine, using the commands **stopsap** and **startsap**, to change the files to `*.bak`.

End of: Enterprise Portal (EP)

7 High Availability with Microsoft Cluster Service

You can install a high-availability SAP system with Microsoft Cluster Service (MSCS). For this type of installation, you have to set up the system on at least two clustered hosts (called "MSCS nodes") and configure it so that it can take advantage of the MSCS software. The MSCS software improves the availability of the system and safeguards it against failure and unplanned downtime, enabling 24-hour operation, 365 days a year.

With high availability 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 problems occur, you can also use MSCS to avoid downtime when you perform essential system maintenance. If you need to maintain one node, you can deliberately switch the cluster resources to another 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.

> 💡 Note
>
> ■ Make sure that you read **SAP Note** 936703, which contains the most recent information as well as corrections for MSCS for SAP NetWeaver 2004s SR1. For more information, see the *SAP installation notes* [page 3] before you begin the installation.
> ■ In this documentation the hosts in an MSCS cluster are referred to as first MSCS node and additional MSCS node(s).
> ■ When you are setting up the SAP system with MSCS, you combine standard installation steps, described earlier in this documentation, with cluster-specific steps, described here.

To install a new SAP system with MSCS, you have to perform a number of extra steps specially required for the cluster and configure the SAP system so that it can take advantage of the cluster functionality:

■ Since the cluster hardware has at least two nodes that have access to all local and shared storage devices, you have to install some components on all nodes and observe special rules for distributing components to local or shared disks.
■ Since the correct configuration of network addresses is absolutely essential to enable the cluster to function properly, you have to perform a number of additional steps that are necessary to set up and check addressing.

💡 Note

If you have an existing SAP system and plan to migrate to a cluster with new hardware, you install the SAP system using a **system copy**. Therefore, you have to prepare for the installation by creating a **homogeneous** or a **heterogeneous** copy of the database. After you have created a copy of the database, you can install your system with MSCS. However, instead of loading the database from the Export DVDs in the installation package, you load it using your exported database.

For more information about a homogeneous or heterogeneous system copy, see the documentation *Homogeneous and Heterogeneous System Copy for SAP Systems based on SAP Web Application Server* on SAP Service Marketplace at `service.sap.com/instguidesNW04`*Installation*. In addition, for more information about a heterogeneous system copy, see `service.sap.com/osdbmigration`.

The documentation for a homogeneous or heterogeneous system copy does not include the cluster-specific information, which is described here.

7.1 Planning

You need to plan the installation of the SAP system on cluster hardware using Microsoft Cluster Service (MSCS).

Process Flow

1. You *decide how to set up your SAP system components in an MSCS configuration* [page 120].
2. You *install an enqueue replication server* [page 123].
3. You *distribute components to disks for MSCS* [page 124].
4. You read *Directories in an MSCS Configuration* [page 127]
5. You read *IP Addresses in an MSCS Configuration* [page 128]
6. You *obtain IP addresses for MSCS* [page 132].
7. You *check the hardware and software requirements for MSCS* [page 134].

7.1.1 SAP System Components in an MSCS Configuration

In an MSCS configuration you have the following components for your SAP system:

SAP System Components in an MSCS Configuration

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

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

If a hardware or software problem occurs on the first MSCS node, the clustered (A)SCS instance and the clustered database automatically fail over to another node.

If you need to maintain the MSCS node where the (A)SCS instance and database are running you can switch these instances to another node. When maintenance work is finished you move the (A)SCS and database instance back to the original node.

The following graphic shows an example where the SPOFs are installed on two MSCS cluster.

Figure 10: Java System
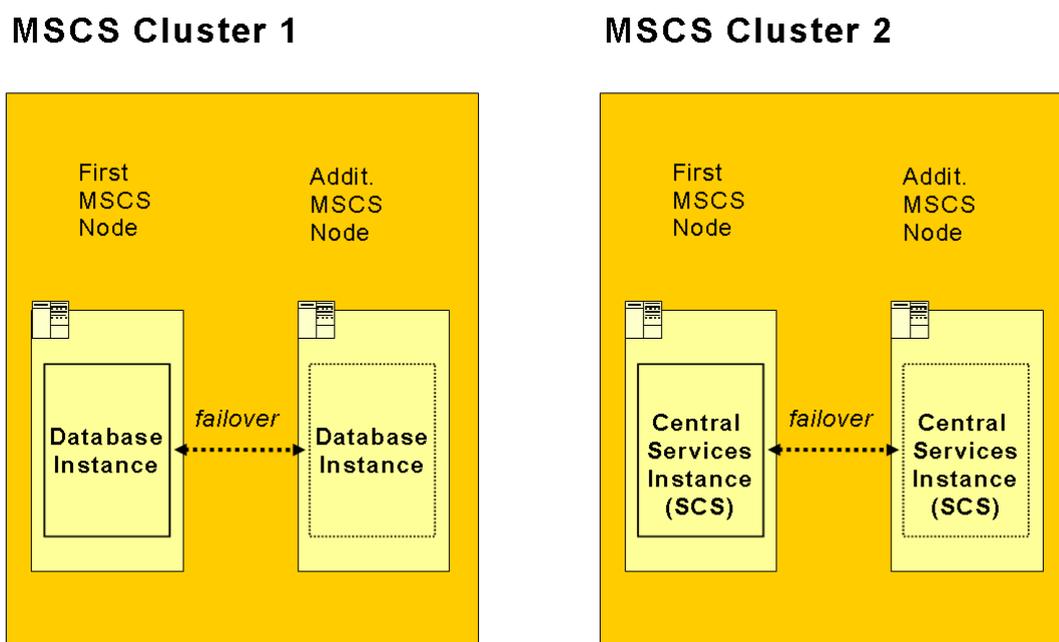
■ To protect system components that are non-SPOFs, for example application servers, you have to install them as multiple components. In this case you must install at least two application servers (one central and at least one dialog instance) on two different hosts. You have the following options:
  ● You install the central instance and the dialog instance on the MSCS nodes of an MSCS cluster. You install them on a **local** disk.
    If you have to maintain an MSCS node, you have to stop the central or dialog instance on that node. When you have finished maintenance, you restart the instance(s).
    Any additional application servers (dialog instances) are installed on hosts outside of the MSCS cluster.
    The following graphic shows the central and dialog instance installed on one MSCS cluster with two MSCS nodes

Figure 11: Java System
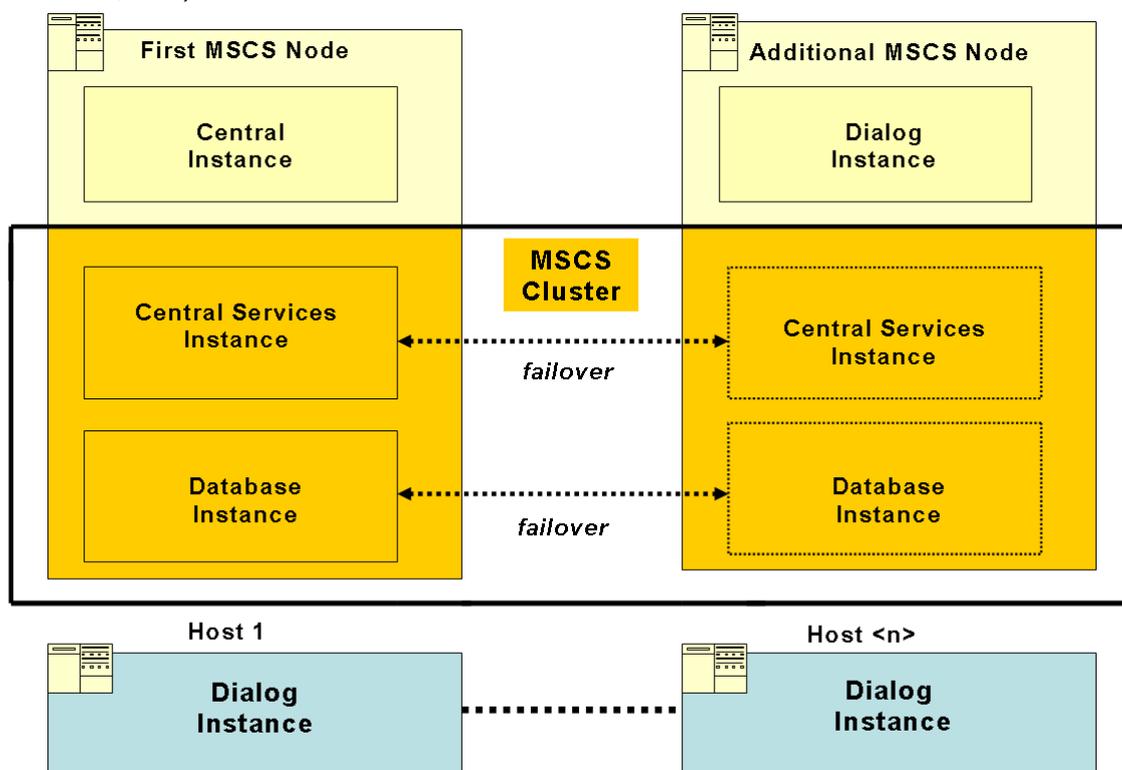
- You install the central instance and all dialog instances outside of an MSCS cluster on different hosts, as show in the following graphic. In this example, the (A)SCS instance and the database instance are installed in one MSCS cluster.

Figure 12: Java System
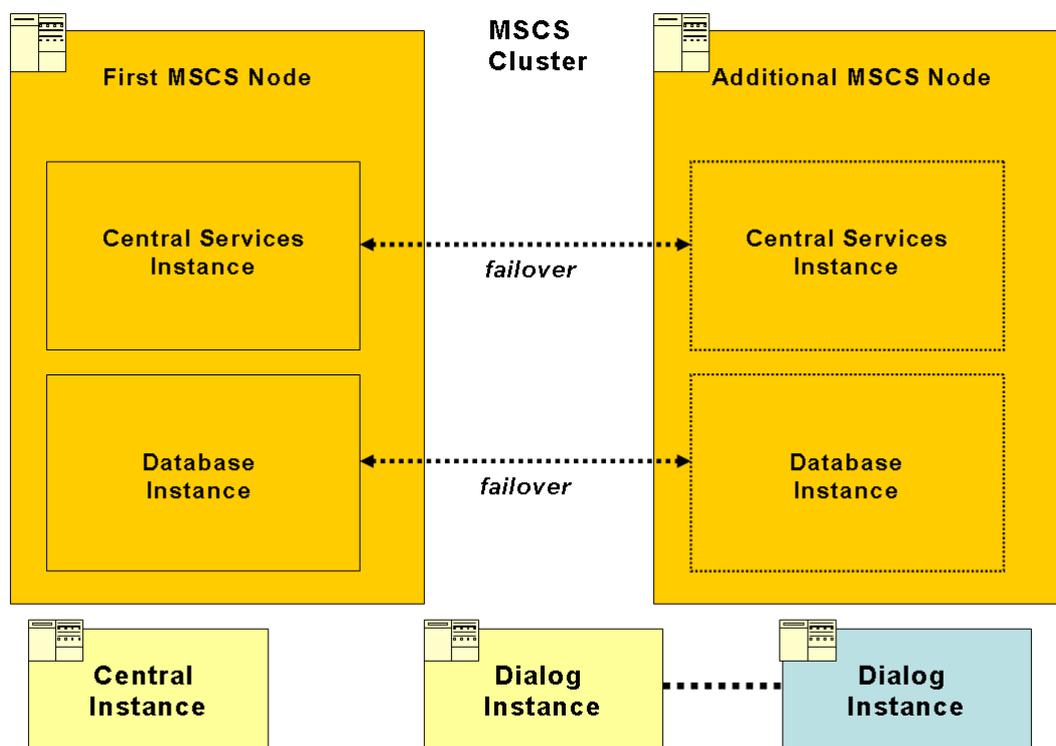
7.1.2 Enqueue Replication Server in an MSCS Configuration

For this type of installation, you install an enqueue replication server on **all** MSCS nodes where the Java central services (SCS) instance is installed.

The enqueue replication server contains a replica of the lock table (replication table).

In normal operation the replication enqueue server is always active on the host where the SCS instance is **not** running.

If an enqueue server in an MSCS cluster with two nodes fails on the first MSCS nodes, the enqueue server on the additional MSCS node is started. It retrieves the data from the replication table on that node and writes it in its lock table. The enqueue replication server on the second MSCS node then becomes inactive. If the first MSCS node is available again, the enqueue replication server on the second MSCS node becomes active again.

The following graphic shows the enqueue replication server mechanism in an MSCS configuration with two nodes:

Figure 13: Enqueue Replication Server Mechanism on One MSCS Cluster with Two Nodes
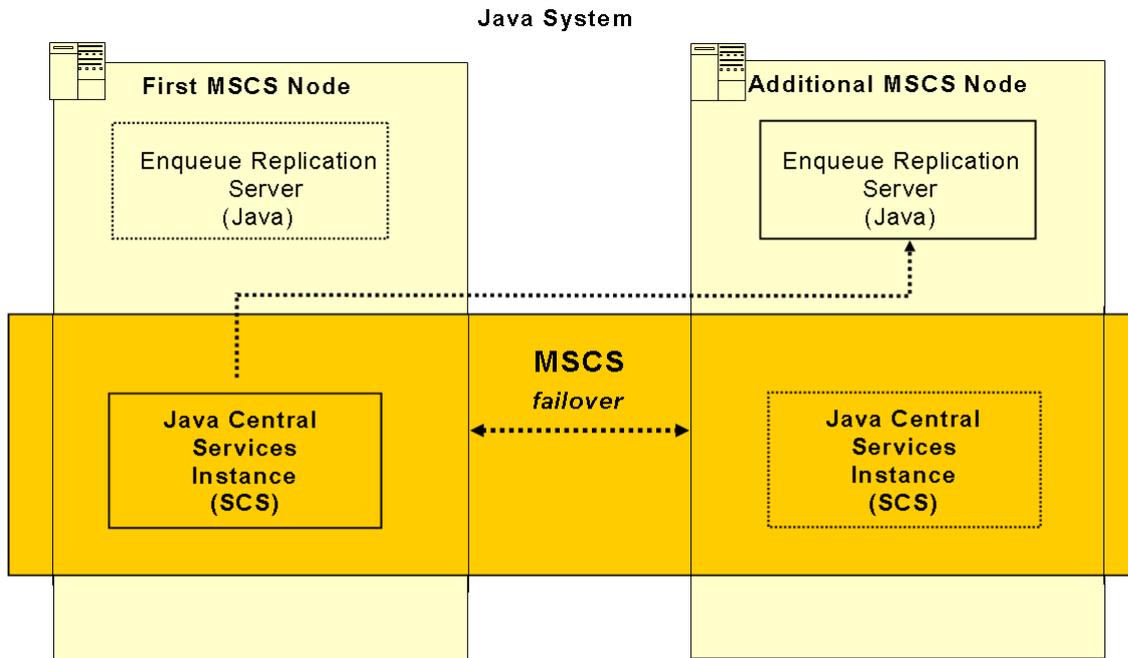
7.1.3 Distribution of Components to Disks for MSCS

One of the central points to keep in mind when planning the MSCS installation is that the cluster hardware has two different sets of disks:

- Local disks that are connected directly to the MSCS node(s)
- Shared disks that can be accessed by all MSCS nodes via a shared interconnect

> **Note**
> Shared disk is a synonym for the MSCS resource of *Resource type* `Physical disk`.

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

- Separately on all MSCS nodes to use the local storage on each node.
  You install the Oracle database server software and the Oracle Fail Safe software on local disks.
- On the shared storage that is used in common by all MSCS nodes.
  You install the following on **different** shared disks:
  - Database data files
  - SAP system executables
  - Single quorum device, if used

With Windows Server 2003, you can now choose between the following cluster models:

■ Single Quorum Device Cluster

In this cluster model the quorum resource maintains the cluster configuration data on a single cluster storage device.

The quorum resource is unique to a cluster installation and is always owned by one of the 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 nodes when the communication between nodes breaks down. This means that cluster resources are forced to fail over to the node that owns the quorum resource.

■ Majority Node Set Cluster

In this new cluster model, each node maintains its own copy of the cluster configuration data. The Majority Node Set resource, acting as the Quorum Resource, ensures that the cluster configuration data is kept consistent across the different nodes.

You can use majority node set for geographically dispersed cluster configuration.

SAP supports Majority Node Set Cluster if it is part of a cluster solution offered by your Original Equipment Manufacturer (OEM), or Independent Hardware Vendor (IHV).

The following graphic shows a cluster configuration where the (A)SCS and DB instance are installed in the same cluster. It illustrates how to distribute the database data files, the SAP system executables, and the quorum resource (if used) to **different** disks. Only with this distribution of files to distinct disks is it possible to move the SAP system and database as separate entities in a failover situation.

Figure 14:
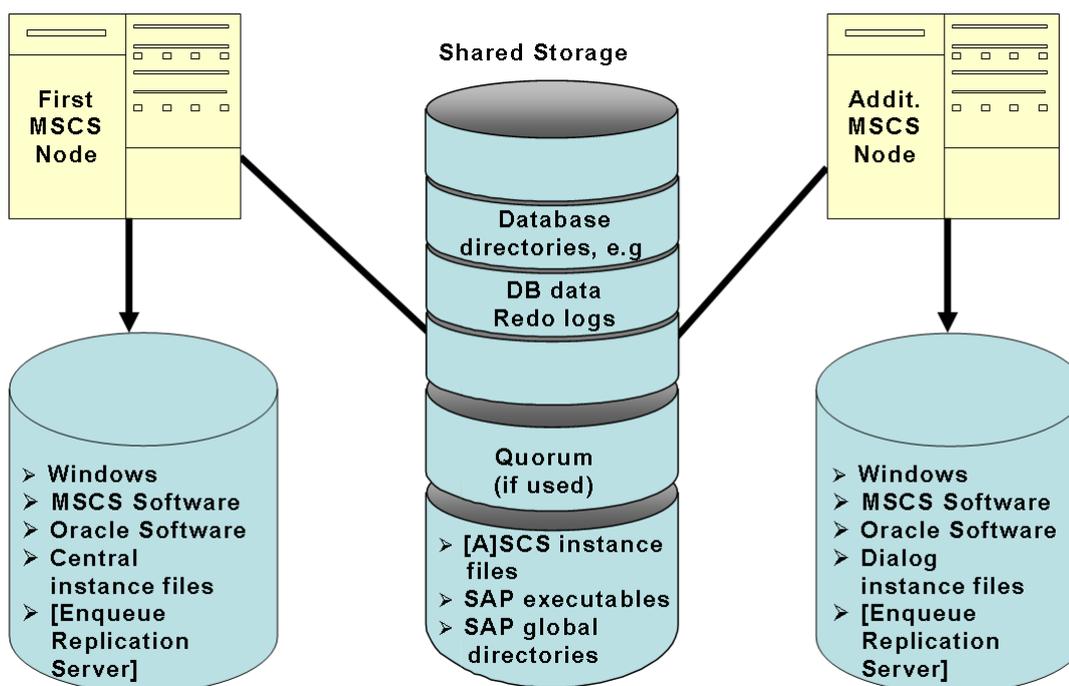
Note

The Oracle server software in the ORACLE HOME directory must have the same drive letter and path on all MSCS nodes.

Distribution of Database Files in a RAID Configuration

Caution

Microsoft does **not** support a Windows operating system-based RAID configuration (Dynamic Disks).

The following graphics show a secure method to distribute the database files to different RAID volumes. You must always locate the database data and redo logs on **separate** RAID volumes.

Figure 15: Distribution of Database Files to Different RAID Volumes for Test or Development Systems

Database RAID Volumes

Operating System Level		RAID Configuration Level
Disk 1	DB Data	RAID 5
Disk 2	Redo Logs Set A Mirrored Redo Logs Set A	
Disk 3	Redo Logs Set B Mirrored Redo Logs Set B	RAID 1
Disk 4	Archived Redo Logs	
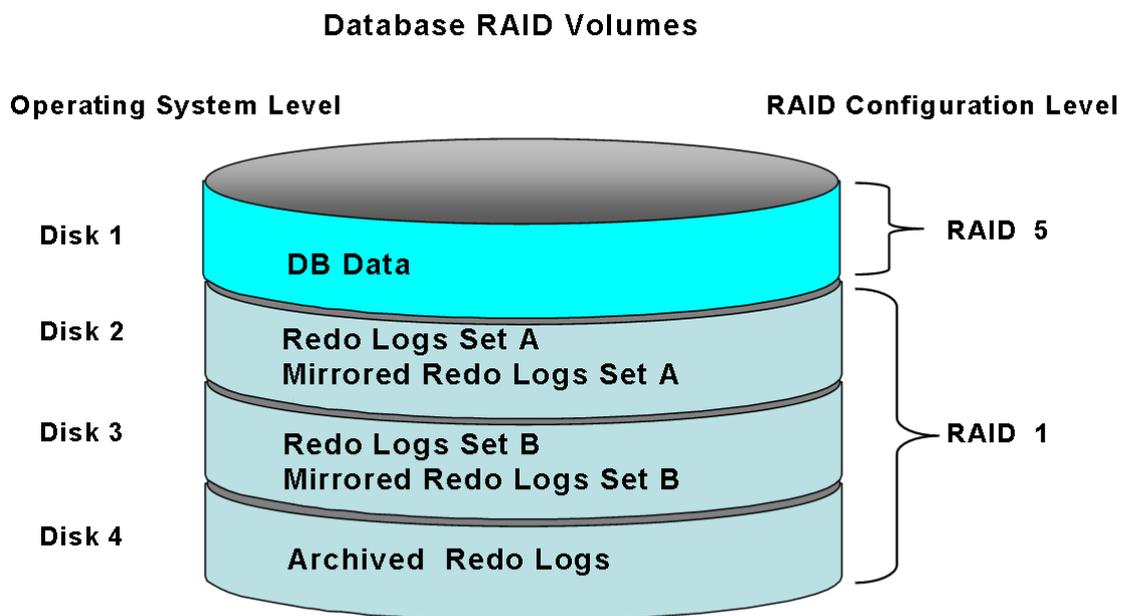
Figure 16: Distribution of Database Files to Different RAID Volumes for Production Systems
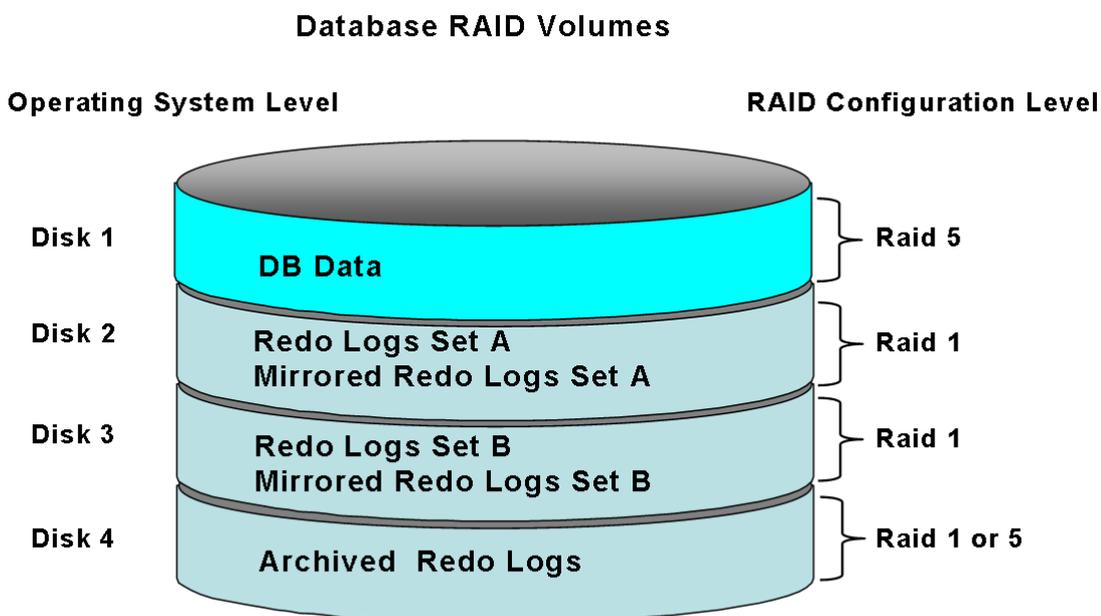
For high-performance production systems, we recommend that you locate the database files on at least four RAID volumes.

Note that the BR*Tools directories \sapreorg, \saptrace, \sapbackup, \sapcheck are not shown in the graphics. You can locate these directories on any of the database volumes as they do not require special security measures.

More Information

Directories in an MSCS Configuration [page 127]

7.1.4 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 Disks on MSCS Nodes

Component	Default Directory
A supported *operating system* [page 134]	`%windir%`
MSCS software	`%windir%\Cluster`

Component	Default Directory
SAP cluster files	`%windir%\SAPCluster`
Oracle server software	`<drive>:\oracle\<SAPSID>\101`
Oracle Fail Safe software	`<drive>:\oracle\OFS`

Directories on Shared Disks

Component	Default Directory
Cluster *quorum resource*	`<drive>:\MSCS`
SAP global and instance directories	`<drive>:\usr\sap ...`

SAP data files	`<drive>:\ORACLE\<SAPSID>\<SAPSID>DATA1`
	`...`
	`\<SAPSID>DATA<n>`

Online redo logs, set A	`<drive>:\ORACLE\<SAPSID>\origlogA`
Online redo logs, set B	`<drive>:\ORACLE\<SAPSID>\origlogB`
Mirrored online redo logs, set A	`<drive>:\ORACLE\<SAPSID>\mirrlogA`
Mirrored online redo logs, set B	`\ORACLE\<SAPSID>\mirrlogB`
Backup of online redo logs	`<drive>:\ORACLE\<SAPSID>\oraarch`

BR*Tools directories	`...\sapreorg, \saptrace,`
	`...\sapbackup, \sapcheck,`
	`...\saparch`

> **Note**
>
> In a live system with intense I/O activity, you must reserve at least 3 times the minimum amount of space specified above for the redo logs and mirrored redo logs.

SapCluster Directory

In an SAP cluster installation, an additional directory — `%WINDIR%\SapCluster` — is created under the system directory.

This contains all the SAP files required by all MSCS 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`.

7.1.5 IP Addresses in an MSCS Configuration

A part of the installation process that is unique to MSCS 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 nodes when hardware problems arise.

This section explains the different types of IP addresses and their function in the switchover mechanism of an MSCS cluster with two nodes.

Types of IP Addresses

In a correctly configured cluster with at least two nodes, there are at least seven IP addresses and corresponding host names. You have two IP addresses for each MSCS node, one IP addresses for the network adapter, and two addresses for the cluster group.

Some of the addresses are physical IP addresses that are assigned to the **network adapters** (cards), others are virtual IP 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 nodes of the cluster.

To set up these two networks, each node needs an adapter for both the private and public network. This means that each 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.

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

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

Figure 17: Adapters and IP Addresses Required for Public and Private Networks in an MSCS Cluster with Two Nodes
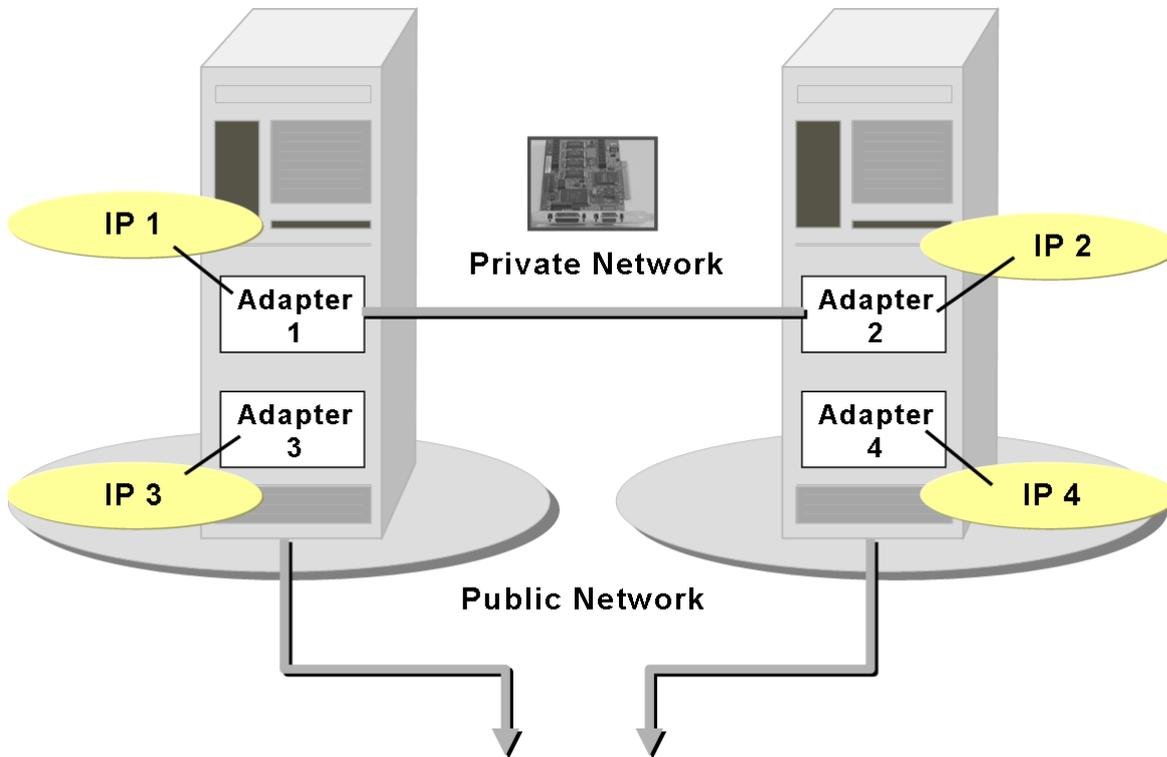
Host Names Assigned to Network Adapters

Each of the physical IP addresses of the network adapters must have a corresponding host name. For example, on the left-hand node in the graphic 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`

⚠️ Caution

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 our example, this means that the machine that is the MSCS node on the left in the graphic has the name `clus1`.
- Do **not** confuse the **host name** with the **computer name**. Each 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 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 node. This has the advantage that, whenever a group is moved between nodes, its IP address and host name move together with it.

A cluster configuration has the following groups:

- SAP 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 node to the other, due to 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 IP address as before.

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

Figure 18: Failover of Virtual IP Addresses
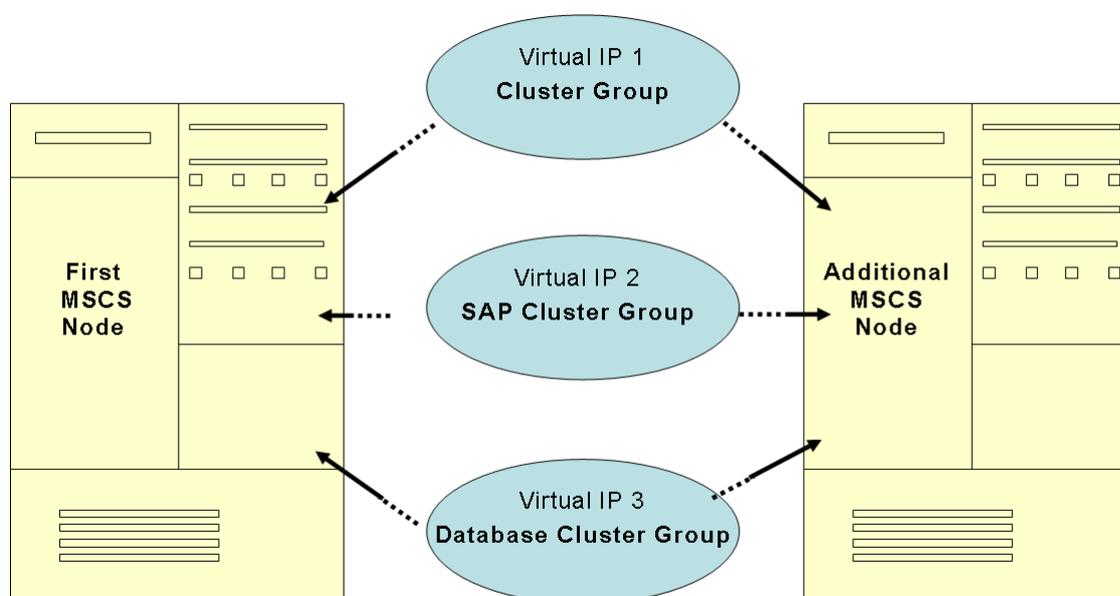
7.1.6 Obtaining IP Addresses for MSCS

You need to correctly configure IP addresses for a cluster system. During the installation procedure you have to assign at least 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 use the table *Virtual IP Addresses* in the procedure *Obtaining IP Addresses*.

Obtaining IP Addresses

Ask the system administrator to give you the addresses and host names listed in the tables below, which shows an example for a configuration with one MSCS cluster with two nodes. You will need to enter the addresses and host names later during the installation process.

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

⚠️ Caution

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

Physical IP Addresses

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

Virtual IP Addresses

Component	Example for Virtual IP Address	Example for Host Name	Purpose	Defined During
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

Component	Example for Virtual IP Address	Example for Host Name	Purpose	Defined During
SAP cluster group	129.20.5.4	sapgrp	Virtual address and name for accessing the group of SAP resources, regardless of the node it is running on	Configuration of SAP system for MSCS with SAPinst on the first node
Database cluster group	129.20.5.5	dbgrp	Virtual address and name for accessing the group of database resources, regardless of the 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.

For more information about IP addresses in the cluster environment, see *IP Addresses in an MSCS Configuration* [page 128].

7.1.7 Checking Hardware and Software Requirements for MSCS

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

Procedure

1. Check that your cluster hardware is certified.
   AddOn Technology Center for SAP (Add On 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 the 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 all 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 the MSCS nodes via a shared bus.

   All software – except the Windows operating system, the Oracle home directory, and the MSCS software – is stored on the shared disks.

   One of the shared disks must be used exclusively by the quorum (if a single quorum device cluster is used) that stores the cluster registry and records information about the state of the cluster.

Disks	Required Space	How to Check
1 local disk on each node	4 GB	a) Choose *Start* ® *Programs* ® *Administrative Tools* ® *Computer Management* ® *Disk Management*. b) Right-click the disk and choose *Properties*.
At least 6 shared disks	2 GB	a) Choose *Start* ® *Programs* ® *Administrative Tools* ® *Computer Management* ® *Disk Management*. b) Right-click the disk and choose *Properties*.

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

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

   For more information, see the *Hardware and Software Requirements Checklists* [page 26].

5. Check that the software you install on the cluster 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 > **Note** > We **strongly** recommend you to use the 64-bit version of the Windows Server 2003 editions.	To check the Windows version a) Choose *Start* ® *Programs* ® *Accessories* ® *Command Prompt* b) Enter the command **winver**
Oracle Enterprise Edition 10g with the current patch set, and hotfix (if available).	For more information on the current patch set, see **SAP Note** 871735. > **Note** > You have to install the Oracle patch set and hotfix (if available) on both nodes.

Software Requirement	How to Check
Oracle Fail Safe software version 3.3.4	-
A suitable Windows Resource Kit is strongly recommended	-

7.2 Preparation

Before you install the SAP system, you need to prepare the system for the MSCS cluster installation.

⚠ Caution

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

Prerequisites

- You have finished the installation planning, especially the *hardware and software requirements* [page 134]
- On **all** MSCS nodes, you install the *operating system* [page 134] with the option *Cluster Service*. For more information, see the Windows documentation.

Process Flow

1. On **all** MSCS nodes, you *manually assign drive letters to the shared disks* [page 136] using the *Windows Disk Administrator*. All MSCS nodes must access the shared disks with the same drive letters.
2. On **all** MSCS nodes, you adjust the size of paging file and the file cache. For more information, see *Hardware and Software Requirements* [page 134] and *Reducing the Size of File Cache* [page 32].
3. You *map the IP addresses to host names* [page 136] on the Domain Name System (DNS) Server or in the `hosts` file.
4. You *check the mapping of host names for MSCS* [page 137].

7.2.1 Assigning Drive Letters for MSCS

We recommend that you assign drive letters for MSCS.

In an MSCS cluster, the shared disks that can be accessed by all nodes via a common bus must be addressed by all 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.

7.2.2 Mapping Host Names to IP Addresses for MSCS

To enable correct operation of the failover mechanism, you have to map all IP addresses in the MSCS 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. However, the system can only respond to host names if they are translated into IP addresses.

Prerequisites

- You have installed the Windows operating system.
- You have the *list of IP addresses* [page 132].
- You have correctly entered **all** seven IP addresses required for the MSCS configuration.

  ⚠ Caution

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

Procedure

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

- Map the host names to IP addresses on a Domain Name System (DNS) server.
- Map the IP addresses in the Windows `hosts` file.
  The file is located in the default Windows directory:
  `%SystemRoot%Drive\system32\drivers\etc`

  🔼 Recommendation

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

7.2.3 Checking the Mapping of Host Names for MSCS

You need to check the mapping of host names to IP addresses as otherwise you might have serious problems later.

Prerequisites

You have *mapped the host names to the IP addresses* [page 136] on the DNS Server or in the `hosts` file.

Procedure

1. For **each** IP address enter the following commands:
   a) `ping -a <IP_Address>`
      The system returns the host name that is assigned to the IP address.
   b) `ping hostname`
      The system returns the IP address that is assigned to the host name.

> **Note**
> - 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 you proceed 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 **all** MSCS nodes:
     a) Choose *Start* ® *Settings* ® *Network and Dial-up Connections*
        The *Network and Dial-up Connections* window appears.
     b) Choose *Advanced* ® *Advanced Settings* ® *Adapters and Bindings*
        The network cards of the private and public networks are displayed for the current MSCS node.

        > **Note**
        > 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

7.3 Installation

You install the SAP system for MSCS.

Prerequisites

- You have completed the installation preparations for MSCS.

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

- You are logged on as domain administrator, unless otherwise specified.
  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. Do not use the user `<sapsid>adm` unless specified.
- On the first MSCS node, in the *Cluster Administrator*, you make sure that all existing cluster groups are online.

Process Flow

⚠ Caution

■ If you are prompted during the installation process, log off and log on again.
■ When you *reboot during the installation process* [page 140], resources fail over to another node. Therefore, after each reboot, you have to return the system to the state it had before the reboot.

1. In the *Cluster Administrator*, you *move all disk groups and the cluster group to the first MSCS node* [page 139].
2. On **all** MSCS nodes, you *install the Oracle database server software and the current patch set and hot fix (if available)* [page 43].
3. On **all** MSCS nodes, you *install the Oracle Fail Safe Software 3.3.3* [page 140].
   After the installation you *reboot* [page 140].

   ⚠ Caution
   Do **not** install the Fail Safe Software **in parallel** on all MSCS nodes.

4. You *install the central services instance (SCS) on the first MSCS node* [page 144].
5. You *cluster the first MSCS node* [page 145].
6. You *install the database instance on the first MSCS node* [page 146].
7. You *cluster the additional MSCS node* [page 147].
8. You *perform additional steps for the Oracle Fail Safe configuration* [page 148].
9. If required, you *install an enqueue replication server* [page 149].
10. You *install the central instance* [page 150].
11. You *create the Oracle Fail Safe group* [page 151].
12. You *set up as shared database directory in your Oracle Home* [page 152].
13. You *add the Oracle database resource to the Fail Safe group* [page 153].
14. You *install at least one dialog instance* [page 154].

7.3.1 Moving MSCS Groups

During the cluster installation you have to move the database, SAP, or disk cluster groups from one MSCS node to the other before you can continue.

You can use the *Cluster Administrator* or the *Fail Safe Manager*, both of which are described in this procedure.

Prerequisites

■ For more information if you need to reboot during the installation, see *Rebooting During the Installation or Conversion for MSCS* [page 140].

Procedure

Moving Groups with the Cluster Administrator
You use the Cluster Administrator for groups that do not belong to the Oracle database groups.

1. Start the *Cluster Administrator* with *Start* ® *Programs* ® *Administrative Tools* ® *Cluster Administrator.*

2. In the *Cluster Administrator*, select the group you want to move and drag it to the required MSCS node on the left-hand pane.
3. Repeat the previous step for each group that you want to move.

Moving Groups with the Fail Safe Manager

You use the Fail Safe Manager to move the Oracle resources, for example, the Oracle database group

1. Start the *Fail Safe Manager* with *Start* ® *Programs* ® *Oracle* <*Home_Name_fail safe*> ® *Oracle Fail Safe Manager.*
2. On the left-hand pane, right-click the group you want to move, and choose *Move to a Different Node* on the context menu
   The group is now moved to another MSCS node.

7.3.2 Rebooting During the Installation or Conversion for MSCS

You only need to perform this procedure if you have to reboot during the installation or conversion for MSCS. A reboot means that resources fail over to another MSCS 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 **not** yet clustered the database, restart the database service.
3. If you have **already** clustered the database, bring the database group online.
4. Recreate the SAPMNT share for the directory usr\sap.

   ⚠ Caution

   You have to reset the permissions for the SAPMNT share from *Read* to *Full Control*, as follows:
   a) Right-click on the directory usr\sap and choose *Sharing and Security*.
   b) Select *Sharing* and in the *Share Name* field, enter SAPMNT.
   c) Under *Permissions*, make sure that the permission for User Everyone for SAPMNT is set to *Full Control*.

7.3.3 Installing the Oracle Fail Safe Software

To enable the database to take advantage of the cluster functionality, you have to install an additional component, the Oracle Fail Safe software. The installation procedure differs depending on whether you install the Oracle Fail Safe software in a 32-bit or a 64-bit system.

Note

The Oracle Fail Safe Service from previous Oracle releases is now called **OracleMSCSServices**. You might still see the old name in certain SAP Notes.

Be sure that you always use the new name `OracleMSCSServices`.

Caution

Before you install the Oracle Fail Safe software, make sure that you have installed the Oracle database software locally on all MSCS nodes, using the same Oracle home.

7.3.3.1 Installing the Oracle Fail Safe Software in a 32-Bit System

Note

You have to install the Oracle Fail Safe (OFS) Software on all MSCS nodes.

1. In the *Cluster Administrator* make sure that the:
   - Other MSCS nodes are not set to *Pause*.
   - SAP group is offline on the MSCS node where you are installing.
2. Make sure that the Cluster Server service is started on all MSCS nodes.
3. Start the *Oracle Universal Installer* from the Oracle RDBMS DVD.
   To do this, double-click the file `sapofs.cmd` in the directory `<DVD_DRIVE>:\OFS334I386`
   The *Installer* opens and guides you through the installation process in a series of screens. Enter the required information as follows:

Note

Screen	Entry
Welcome	Choose *Next*.
Specify File Locations	■ *Source ....* For *Path:* The path to the Oracle software on the DVD is displayed. Do **not** change the path. ■ *Destination ... :* ● For *Name*: Enter the name of the `<Oracle_Home>` for the Fail Safe software. The Fail Safe software must be installed in a separate `<Oracle_Home>` directory, for example **OFS**. Use the same `<Oracle_Home>` for all MSCS nodes. ● For *Path* Enter the path of the `<Oracle_Home>` directory for the Fail Safe software. It must be on a local disk, for example: `F:\Oracle\OFS`
Available Products	Select *Oracle Fail Safe 3.3.4.0.0* and choose *Next*.
Installation types	Choose *Typical*.

Screen	Entry
Reboot Needed After Installation	Choose *Next*.
Summary	View the information and choose *Install*.
Install	Wait while the software is installed.
Configuration Tools	On the dialog box *Oracle Fail Safe Account/Password* enter the account and password under which the *Fail Safe* software is to run. This must be the same account as the one under which the Cluster *Server service* is running. To find out which account must be entered, choose *Start* < ® *Settings* > ® *Control Panel* ® *Administrative Tools* ® *Services*. Select the Cluster Service and click *Startup…* The log on account for the service is displayed. Enter this account for *Oracle Fail Safe Account/Password*.
End of Installation	Choose *Exit* to close the Oracle Universal Installer.

4. Reboot and log on again.

   ⚠ Caution

   Do not reboot an MSCS node, if the installation of OFS 3.3.4 is in progress on another MSCS node.

7.3.3.2 Installing the Oracle Fail Safe Software in a 64-Bit System

If you use a 64-bit system you first have to install the 64-bit Fail Safe server software, and then the 32-bit Fail Safe client software.

   💡 Note

   You have to install the Oracle Fail Safe (OFS) Software on all MSCS nodes.

Prerequisites

■ In the *Cluster Administrator* make sure that the:
  ● Other MSCS node is not set to *Pause*.
  ● SAP group is offline on the node where you are installing.
■ Make sure that the *Cluster Server* service is started on all MSCS nodes.

Procedure

1. Start the *Oracle Universal Installer* from the Oracle RDBMS DVD to install the Fail Safe server software:
   a) Double-click the file `sapofs.cmd` in the directory `<DVD_DRIVE>:\OFS334IA64`.
   b) Enter the required information as shown in the following table:

Screen	Entry
Welcome	Choose *Next*.
File Locations	*Source...* For *Path* The path to the Oracle software on the DVD is displayed. Do not change the path. *Destination...* For *Name* Enter the name of the `Oracle_Home` for the *Fail Safe* software. The Fail Safe software must be installed in a separate `Oracle_Home` directory, for example `OFSSRV`. Use the same `Oracle_Home` for both nodes. For *Path* Enter the path of the `Oracle_Home` directory for the *Fail Safe* software. It must be on a local disk, for example: `F:\Oracle\OFS\SRV` Choose *Next*.
Installation Types	Choose *Typical*.
Reboot Needed After Installation	Choose *Next*.
Summary	View the information and choose *Install*.
Install	Wait while the software is installed.
Configuration Tools	On the dialog box *Oracle Fail Safe Account/Password* enter the account and password under which the *Fail Safe software* is to run. This must be the same account as the one under which the *Cluster Server* service is running. To find out which account must be entered, choose *Start* < ® *Settings* > ® *Control Panel* ® *Administrative Tools* ® *Services*. Select the Cluster Service and choose *Startup...* The log on account for the service is displayed. Enter this account for *Oracle Fail Safe Account/Password....*
End of Installation	Choose *Exit* to close the Oracle Universal Installer.

2. Start the *Oracle Universal Installer* from the Oracle RDBMS DVD to install the 32-bit Fail Safe client software:
   a) Double-click the file `sapofs.cmd` in the directory `<DVD_DRIVE>:\OFS334I386`
   b) Enter the required information as shown in the following table:

Screen	Entry
Welcome	Choose *Next*.

Screen	Entry
File Locations	*Source...* For *Path* : The path to the Oracle software on the DVD is displayed. Do **not** change the path. *Destination...* For *Name*: Enter the name of the `Oracle_Home` for the Fail Safe software. The Fail Safe software must be installed in a separate `Oracle_Home` directory, for example `OFSCLI`. Use the same `Oracle_Home` for all MSCS nodes. For *Path* Enter the path of the `Oracle_Home` directory for the Fail Safe software. It must be on a local disk, for example: `F:\Oracle\OFS\CLI.`
Available Products	Select *Oracle Fail Safe 3.3.4.0.0* and choose *Next*.
Installation Types	Choose *Client Only*.
Summary	View the information and choose *Install*.
Install	Wait while the software is installed.
End of Installation	Choose *Exit* to close the Oracle Universal Installer.

3. Reboot and log on again.

⚠ Caution

   Do not reboot an MSCS node, if the installation of OFS 3.3.4 is in progress on another MSCS node.

7.3.4 Installing the Central Services Instance (SCS)

⚠ Caution

   If you install a **Java Add-In for ABAP**, make sure that you install the SCS instance on the same shared disk as the ASCS instance.

1. *Run SAPinst* [page 46] and choose *<Your SAP System>* ® *SAP Systems* ® *<Database>* ® *High-Availability System* ® *Based on <technical stack>* ® *Central Services Instance (SCS)*.
2. If you are installing the SCS instance with SAPinst for the first time and SAPinst prompts you to log off, choose *OK* and log on again.
3. Follow the instructions in the SAPinst dialogs and enter the required parameter values.

Note

For more information about the input parameters, position the cursor on a parameter and press F1 in SAPinst.

Caution

The SCS installation drive must be a **shared** disk which belongs to the SAP cluster group.

4. Check that the SCS instance is running.

7.3.5 Configuring the First MSCS Node

To configure the first MSCS node so that it functions properly in MSCS, you have to run the cluster configuration option offered by the SAPinst tool. When you run this option it:

■ Creates the SAP cluster group
■ Copies tools to the `SAPCluster` directory
■ Sets the `SAPService` to *manual*
■ Makes sure that the `SAPOsCol` service is started from the `SAPCluster` directory

Caution

When you *reboot during the conversion to MSCS* [page 140], resources fail over to another MSCS node. Therefore, after each reboot you have to return the system to the state it had before the reboot.

Prerequisites

■ You are logged on to the **first** MSCS node as domain administrator or as a local user with domain administration rights. For more information, see *Performing a Domain Installation without being a Domain Administrator* [page 34].
■ The SCS installation drive must be online on the first MSCS node.

Procedure

1. Run SAPinst [page 46] and choose *<Your SAP System>* ® *SAP Systems* ® *<Database>* ® *High-Availability System* ® *Based on <technical stack>* ® *First MSCS Node*.

   Note

   If SAPinst prompts you to log off from your system, log off and log on again.

2. Enter the required parameter values.

> 💡 **Note**
>
> Make sure that you choose instance type *Java SCS Instance (Java only)*.

> 💡 **Note**
>
> For more information about the input parameters, position the cursor on the parameter and press `F1` in SAPinst.

3. When the installation is finished, make sure that the following value is set in the default profile:
   `enque/serverhost=<Virtual_(A)SCS_HostName>`

Result

SAPinst converts the SAP instances on the first MSCS node for operation in MSCS.

7.3.6 Installing the Database Instance

Prerequisites

- The SAP cluster group is *Online* on the first MSCS node.
- The Oracle shared disk is *Online* on the first MSCS node.
- You have added the Oracle virtual IP network name to the Oracle cluster group and brought it online on the first MSCS node.

Procedure

Perform the following steps on the first MSCS node.

1. On the first MSCS node, *run SAPinst* [page 46] and choose *<Your SAP System>* ® *SAP Systems* ® *<Database>* ® *High-Availability System* ® *Based on <technical stack>* ® *Database Instance*.
2. Follow the instructions in the SAPinst dialogs and enter the required parameter values.
   a) For the profile UNC path you have to use the **virtual** (A)SCS host name, for example:
      `\\<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile`.
   b) Make sure that in the database host field, the **virtual** database host is displayed.

⚠️ Caution

By default, SAPinst locates the `saparch`, `sapreorg`, `sapcheck` and `saptrace` directories on the last available drive. If this is a local drive, you must specify that these directories reside on a **shared** disk by using *Advanced Database Options*, which you can find on the screen *Oracle > Database Instance*. Continue with *Next* until you can select *Windows Drive Mapping*. Check the box and choose *Next*. Then relocate all folders to a shared disk.

💡 Note

For more information about the input parameters, position the cursor on a parameter and press the `F1` key in SAPinst.

7.3.7 Configuring the Additional MSCS Node

To configure the additional MSCS node(s) in the cluster, you have to run the MSCS configuration option foreach additional MSCS node offered by the SAPinst tool. When you run this option it:

■ Creates users and groups
■ Sets the system and user environment
■ Enters required port numbers in the Windows services file
■ Creates the `SAPService` and `SAPOsCol` Services

⚠️ Caution

When you *reboot during the conversion to MSCS* [page 140], resources fail over to another MSCS node. Therefore, after each reboot you have to return the system to the state it had before the reboot.

Prerequisites

■ You are logged on to the **additional** MSCS node as domain administrator or as a local user with domain administration rights. For more information, see *Performing ad Domain Installation without being a Domain Administrator* [page 34].
■ You have already configured *the first MSCS node* [page 145], which is the primary cluster node.

Procedure

1. *Run SAPinst* [page 46] and choose *Additional MSCS Node*.

   💡 Note
   If SAPinst prompts you to log off from your system, log off and log on again.

2. Run SAPinst and choose *<Your SAP System>* ® *SAP Systems* ® *<Database>* ® *High-Availability System* ® *Based on <technical stack>* ® *Additional MSCS Node*.

   💡 Note
   If SAPinst prompts you to log off from your system, log off and log on again.

3. Enter the required parameter values.

> **Note**
>
> Make sure that you choose instance type *Java SCS Instance (Java only)*.

> **Note**
>
> For more information about the input parameters, position the cursor on the parameter and press `F1` in SAPinst.

When you have made all required entries, SAPinst begins processing and converts the SAP instances on the other MSCS node for operation in MSCS.

4. When SAPinst has finished, start the SAP cluster group `SAP <SAPSID>` as follows:
   a) Open the *Cluster Administrator* with *Start* ® *Programs* ® *Administration Tools* ® *Cluster Administrator*.
   b) Select the SAP cluster group and bring it online.

7.3.8 Additional Steps for the Oracle Fail Safe Configuration

To complete the Oracle Fail Safe configuration you must perform the following steps:

- Adjusting security settings
  Oracle only allows the use of computer local groups to identify database operators and administrators.
  Therefore, the local groups that were created on the first MSCS node are not known on the MSCS nodes.
  This means that you have to create these groups manually and grant them access to the database directories.
- Copying BR*Tools to the `sapcluster` directory

Procedure

1. Create the local groups `ORA_<dbsid>_DBA` and `ORA_<dbsid>_OPER`.
2. Add `<sapsid>adm` and `SAPService<sapsid>` to these local groups.

   > **Example**
   > ```
   > net localgroup ORA_<DBSID>_DBA /add
   > net localgroup ORA_<DBSID>_OPER /add
   > net localgroup ORA_<DBSID>_DBA <sapsid>adm /add
   > net localgroup ORA_<DBSID>_OPER <sapsid>adm /add
   > net localgroup ORA_<DBSID>_DBA SapService<sapsid> /add
   > net localgroup ORA_<DBSID>_OPER SAPService<sapsid>/add
   > ```

3. On all `oracle\<DBSID>` directories on all disk drives, adjust the security settings as follows:
   a) Right-click `\oracle\<dbsid>` and select *Sharing and Security...*.
   b) Select the *Security* tab, add both local groups to the `Group` or `Users` list and grant them *Full Control*.

c) Choose *Advanced* and check *Replace Permission entries on all child objects with entries shown here that apply to child objects.*

> ⚠ Caution
>
> Do **not** remove entries like *S-1-5-21-3434515990-3720764010-1539101042-1005* from the list.
> These entries represent local groups from other cluster nodes, which cannot be translated to users on the current host. Removing them leads to missing entries if these resources are running on other cluster nodes

4. On all MSCS nodes, copy the BR*Tools to the local `windows\sapcluster` directory with the following command:

```
sapcpe.exe source:<path_to_platform_directory>
target_<path_to_platform_directory>\dbatoolsora.lst
```

7.3.9 Installing an Enqueue Replication Server

We **strongly** recommend to install an enqueue replication server with SAPinst on **all** MSCS nodes where an SCS instance is running.

> 💡 Note
>
> You have to perform the installation at least two times.

Prerequisites

- Your SCS instance is already clustered with MSCS.
- You have to install the enqueue replication server on a **local** disk.

Procedure

1. On the **first** MSCS node, log on as domain user who is a member of the local administrators group.
2. *Run SAPinst* [page] and choose *<Your SAP System>* ® *SAP Systems* ® *<Database>* ® *High-Availability System* ® *Based on <technical stack>* ® *Enqueue Replication Server.*
3. Follow the instructions in the SAPinst dialogs and enter the required parameters.
   Note the following, when entering the parameters
   - On the SAPinst screen: *SAP System > SAP Instance*, enter the:
     - SAP system ID <SAPSID> of your SAP system
     - Instance number of the SCS instance
     - **Virtual** instance host name of the SCS instance
   - On the SAPinst screen *SAP System > Enqueue Replication Server Instance*, enter a **unique** instance number that is not in use by another instance on this host.
   - Decide if you want to restart the SCS instance and service cluster resources with SAPinst now, or later with the Cluster Administrator.

Note

> You **only** need to do this **once** for all enqueue replication servers that you install on the MSCS nodes.

After you have entered all required input information, SAPinst starts the installation and displays the progress of the installation. During the process phase, the enqueue server instance is started. SAPinst installs the enqueue replication server instance on a local disk in the following directory:

`.\usr\sap\<SAPSID>\ERS<instance_number>\`

Note

> The profile is replicated from the global host to the local instance profile folder. The enqueue replication server instance uses the profile from the local instance profile folder:
>
> `.\usr\sap\<SAPSID>\ERS<instance_number>\profile\`

4. On the **additional** MSCS node, start SAPinst to install the enqueue replication server for the SCS instance as described in step 2 above.

Note

> There is no need to move the SCS cluster group to another MSCS node.

5. Enter the required parameter values in the SAPinst dialogs as described above.

7.3.10 Installing the Central Instance

The following describes how to install the central instance for MSCS.
   You have the following options to install the central instance:

- You install the central instance on an MSCS node.
  In this case, bring the SAP cluster group online on this node, and make sure that the central instance number is different from the (A)SCS instance number.
- You install the central instance on a host outside of MSCS.

Procedure

1. *Run SAPinst* [page 46] *and choose* <*Your SAP System*> ® *SAP Systems* ® <*Database*> ® *High-Availability System* ® *Based on* <*technical stack*> ® *Central Instance.*
2. If SAPinst prompts you to log off, choose *OK* and log on again.
3. Follow the instructions in the SAPinst dialogs and enter the required parameter values.

⚠ Caution

■ If you install the central instance on an MSCS node, make sure that on the screen *SAP System > General Parameters* for the:

  ● *Profile Directory*, you use the UNC path of the **virtual** (A)SCS host name, for example:
    `\\<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile`.

  ● *Installation Drive*, you choose the local disk where you want to install the central instance. Do **not** enter the shared disk for the (A)SCS instance.

💡 Note

For more information about the input parameters, position the cursor on a parameter and press `F1` in SAPinst.

4. Check that the central instance is running.

7.3.11 Creating the Oracle Fail Safe Group

You perform the following steps in the Fail Safe Manager on the first MSCS node.

Prerequisites

Make sure that you have stopped the central instance.

Procedure

1. Stop the central instance.
2. Change the physical host name into the virtual database host name as follows:
    a) Change to the local directory of the central instance:
        `<drive>:\usr\sap\<SAPSID>\JC<Instance_number>\j2ee\configtool\`
    b) Run `configtool.bat` to start the J2EE Engine Config Tool.
    c) Choose *secure store* and then select *jdbc/pool/<SAPSID>Url*.
    d) In the *Value* field, change the physical host name into the virtual database host name.
    e) Choose *Add* and save your changes.
3. Choose *Start* ® *Programs* ® *Oracle - <OFSClient_Home>* ® *Oracle Fail Safe Manager*.
    The window *Add Cluster To Tree* appears.
4. Insert your virtual cluster name.
5. Right-click the cluster and choose *Connect to cluster*.
6. Enter the following and then confirm your entries with *OK*:

User name	`<user>` (user with the account under which the service *ClusterServer* is running)
Password	`<password>`
Cluster Alias	`<virtual_cluster_name>` (name of the cluster you are installing)
Domain	`<domain_name>`

7. In the *Welcome* dialog box, choose *Verify Cluster*.

> **Note**
>
> All MSCS cluster nodes must be up and running for this step.

The window *Clusterwide Operation: Verifying Fail Safe Cluster* shows the steps that are executed to verify the cluster. When you are informed that the operation has completed successfully, close the window.

8. In the *Oracle Fail Safe Manager*, create the *Fail Safe* group `ORACLE<DBSID>`.

Choose *Groups* ® *Create*.

The window *Create Group:..* appears.

9. Enter the *Group Name* `ORACLE<DBSID>`.

In answer to the question *Do you want to allow the group to failback to preferred node?*, select *Prevent failback*.

The window *Finish Creating the Group* appears and displays information about the group. Choose *OK*.

10. In the window *Add Virtual Address*, select *Yes* to indicate that you want to add a virtual address to the group.

The *Add Resource to Group: - Virtual Address* appears.

11. Select *Show networks accessible by clients* and enter the following information:

Under *Network* leave the entry **public**

Under *Virtual Address* for *Host Name* enter the `<virtual_hostname>` .

The *IP Address* is automatically recognized.

Choose *Finish*.

The window *Add the Virtual Address to the Fail Group* appears. Choose *OK*.

> **Note**
>
> If the *Fail Safe Manager* cannot create the *Fail Safe* group, look at the *Windows Event Logs* on all MSCS nodes to find out the reason for the failure.

7.3.12 Setting Up a Shared Database Directory in Oracle Home

As of Oracle 10g your database is configured for using an `spfile`. With an `spfile` you can set up a central (shared) `<Oracle_Home>\database`-directory for MSCS with a link or junction.

A central `<Oracle_Home>\database`-directory has the following advantages:

- You can also use *sqlplus* remotely to make changes to your profile parameters
- You only have to make the changes in the parameter files once in the shared `<Oracle_Home>\database`-directory.

> **Note**
>
> In the past, you had to apply all changes in the parameter file `init<DBSID>.ora` in the `<Oracle_Home>\database`-directories on all MSCS nodes.

Prerequisites

You have one of the following executables available:

■ `linkd.exe`

This executable is part of the Microsoft Windows 2003 Server Resource Kit. You can download the kit from **www.microsoft.com** . Search for *Microsoft Windows 2003 Server Resource Kit.*

> **Note**
> After you have installed the resource kit you can copy `linkd.exe` to a local directory.

■ `junction.exe`

You can download this executable from **www.sysinternals.com** (Search for *junction*).

Procedure

1. Stop the Oracle database and the Oracle Service.
2. In the `sapdata1` directory create the directory `database`.
    The `sapdata1` directory is located on a shared disk in the cluster.
3. On the first MSCS node, change to the Oracle Home directory, and enter the following command:
    `move * <path to_sapdata1>\database`
4. Delete the `<Oracle_Home>\database`-directory with the command:
    rd /q /s database

    > **Note**
    > You can also use the Windows Explorer to delete the directory.

5. Create the junction or link with the following command:
    ■ If you use `junction`, enter:
       <path_to_junction.exe> %Oracle_Home%\database <complete_path_to_sapdata1>\database
    ■ If you use `linkd` enter:
       <path_to_linkd.exe> %Oracle_Home%\database <complete_path_to_sapdata1>\database

    > **Note**
    > You can also use the 32-bit `junction.exe` or `linkd.exe` in a 64-bit Windows operating system.

6. Move the disk, where the ...\`sapdata1\database` directory is located, to the additional MSCS node.
7. Repeat steps 4 and 5 on the additional MSCS node.
8. Create the `init<DBSID>_OFS.ora` file in the `database` directory, and enter the following line:
    spfile = <path_to_Oracle_Home>\database\SPFILE<DBSID>.ora

7.3.13 Adding the Oracle Database Resource to the Fail Safe Group

1. Copy the `sqlnet.ora` file from the directory `<ORACLE_HOME>\network\admin` on the first MSCS node to the same directory on the additional MSCS node(s).
2. Start the *Oracle Fail Safe Manager* with *Start* ® *Programs* ® *Oracle – <Fail_Safe_Home_Name>* ® *Oracle Fail Safe Manager.*

3. In the tree on the left, expand *<First MSCS Node>* ® *Standalone Resources* and then select the database `<DBSID>.world`.

4. Choose *Resources* ® *Add to Group*.

5. On the dialog box *Add Resource to Group − Resources:*
   For *Resource Type*, select *Oracle Database*.
   For *Group name*, select *Oracle<DBSID>*.

6. On the dialog box *Add Resource to Group − Database Identity*, enter the following:

Service Name	`<DBSID>.world`
Instance Name	`<DBSID>`
Database Name	`<DBSID>`
Parameter File	`<DRIVE>:\<ORACLE_HOME>\database\init<DBSID>_OFS.ora`

7. When you have made all entries, choose *Next*.

8. On the dialog box *Confirm Add Database to Group* choose *Yes*.

9. For each MSCS node a pop-up appears: *The Oracle Net Listener uses a host name in the host address parameter. It must be converted to use an IP address.*
   Choose *Yes* to convert to an IP address.

10. In the `DEFAULT` profile, replace the physical host name with the virtual database host name in the following variables:
   `SAPDBHOST`
   `j2ee\dbhost`.
   The default profile is located at: `\\<virtual_SAP_hostname>\sapmnt\<SID>\sys\profile\DEFAULT.PFL`.

11. Copy `tnsnames.ora` from `%ORACLE_HOME%\network\admin` to `\\<sapglobalhost>\sapmnt\<SAPSID>\SYS\profile\oracle`.

7.3.14 Installing the Dialog Instance

You have to install at least one dialog instance for MSCS.
   You have the following options to install the dialog instance:

■ You install the dialog instance on an MSCS node.
   In this case, bring the SAP cluster group online on this node, and make sure that the dialog instance number is different from the (A)SCS instance number.

■ You install the dialog instance on a host outside of MSCS.

Procedure

1. *Run SAPinst* [page 46] and choose *<Your SAP System>* ® *SAP Systems* ® *<Database>* ® *High-Availability System* ® *Based on <technical stack>* ® *Dialog Instance*

2. If SAPinst prompts you to log off, choose *OK* and log on again.

3. Follow the instructions in the SAPinst dialogs and enter the required parameter values.

⚠ Caution

■ If you install the dialog instance on an MSCS node, make sure that on the screen *SAP System > General Parameters* for the:

● *Profile Directory*, you use the UNC path of the **virtual** (A)SCS host name, for example:

`\\<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile`.

● *Installation Drive*, you choose the local disk where you want to install the dialog instance. Do **not** enter the shared disk for the (A)SCS instance.

💡 Note

For more information about the input parameters, position the cursor on a parameter and press `F1` in SAPinst.

4. If required, install additional dialog instances outside of MSCS.

⚠ Caution

Make sure that on the screen *SAP System > General Parameters* for the *Profile Directory*, you use the UNC path of the **virtual** (A)SCS host name, for example:

`\\<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile`.

7.4 Post-Installation

This section describes how to complete and check the installation of the SAP system for an MSCS configuration.

Prerequisites

■ You have completed the installation steps explained in previous sections of this documentation.
■ You *have installed at least one SAP front end* [page 36].

Process Flow

1. You *start and stop the SAP system in an MSCS configuration* [page 155].
2. You *perform the post-installation checks for the enqueue replication server* [page 156].
3. If required, you perform the other *post-installation steps* [page 59] listed in Chapter 6 in this guide.

7.4.1 Starting and Stopping the SAP System in an MSCS Configuration

The following describes how to start or stop the SAP system in an MSCS configuration with the:

■ SAP MMC

■ Cluster Administrator

> 💡 **Note**
>
> You also use the *Cluster Administrator* for all other administrative tasks like moving instances from one MSCS node to another MSCS node.

Procedure

■ To start or stop your SAP system with the **SAP MMC**, see *Starting and Stopping the SAP System* [page 60].

■ To start or stop your SAP system with the **Cluster Administrator** do the following:

1. Start the *Cluster Administrator* by choosing *Start* ⓡ *Programs* ⓡ *Administrative Tools* ⓡ *Cluster Administrator*.

2. To start or stop all instances belonging to the SAP cluster group, right-click the SAP cluster group *SAP <SAPSID>* and choose *Bring online* or *Take offline*.

3. To start or stop a single instance of the SAP cluster group, right-click the instance *SAP <SAPSID> <instance_no> Instance* and choose *Bring online* or *Take offline*.

7.4.2 Post-Installation Checks for Enqueue Replication Server

> 💡 **Note**
>
> Make sure that you have restarted the SCS instance and service cluster resources *SAP <SAPSID> <SCS_instance_number> Instance* and *SAP <SAPSID> <SCS_instance_number> Service* during the installation with SAPinst or with the Cluster Administrator.

The following sections describe the tests you must perform to check whether the installed enqueue replication server works properly. For these tests you use the ENQT and ENSMON command line tools, which allow remote access to the enqueue server statistics. Before you can use these tools you must copy them to the remote host where the Enqueue Replication Server is running and from where you want to start the tests.

    You perform the following steps:

1. You copy `ENQT.exe` and `ENSMON.exe` from your cluster's binary directory on the `sapmnt` share `\\<host>\sapmnt\<SAPSID>\SYS\exe\<codepage>\<platform>` to a directory on the remote host from where you run the tests.

2. You *check the status of the enqueue replication server with the ENSMON tool* [page 156].

3. You *check the fill status and ID of the lock table during failover with the ENQT tool* [page 157].

7.4.2.1 Checking the Status of the Enqueue Replication Server with ENSMON

You use the ENSMON tool to check if the enqueue replication server and the enqueue server are properly connected.

Prerequisites

■ You have started the SCS instance of your SAP system.

■ You run the ENSMON tool from the host where you installed the Enqueue Replication Server.

Procedure

To check the status of the enqueue replication server enter the following command:

> `ensmon pf=<ERS_instance_profile> 2`

where `<ERS_instance_profile>` is the profile created during the installation of the Enqueue Replication Server.

■ If the enqueue replication server and the enqueue server are properly connected, the output is similar to this:

> `Try to connect to host <Virtual (A)SCS host> service sapdp01 get replinfo request executed successfully`
>
> `Replication is enabled in server, repl.  server is connected`
>
> `Replication is active`
>
> `...`

■ If the enqueue replication server and the enqueue server are **not** properly connected, the output is similar to this:

> `Try to connect to host <Virtual (A)SCS host> service sapdp01 get replinfo request executed successfully`
>
> `Replication is enabled in server, but no repl.  server is connected`
>
> `...`

7.4.2.2 Monitoring the Lock Table During Failover with ENQT

With the following tests you monitor and check the lock table's **fill status** and the lock table **ID** using the ENQT tool.

Prerequisites

■ You have started the SCS instance of your SAP system.

■ You run the ENQT tool from the host where you installed the Enqueue Replication Server.

⚠ Caution

Only use the ENQT commands stated in this procedure otherwise you might damage the enqueue server's lock table.

Monitoring the Lock Table Fill Status During Failover with ENQT

1. Use the following command to fill the lock table of the enqueue server with 20 locks:

   > `enqt pf=<ERS_instance_profile> 11 20`

   where `<ERS_instance_profile>` is the profile created during the installation of the Enqueue Replication Server.

2. Monitor the fill status of the lock table with the following command:

```
enqt pf=<ERS_instance_profile> 20 1 1 9999
```
This command continuously reads the content of the enqueue server's lock table and returns the number of the table entries to the console.

3. Move the (A)SCS cluster group to another MSCS node to simulate an enqueue server failover while running the ENQT command.
    The output is similar to this:

```
Number of selected entries:  20

Number of selected entries:  20

Number of selected entries:  20

Number of selected entries:  20

Number of selected entries:  20

Number of selected entries:  0 ( enqueue server fails over )

Number of selected entries:  20 ( enqueue server is running again )

Number of selected entries:  20

Number of selected entries:  20

Number of selected entries:  20

...
```

4. Make sure that the lock count **is the same** before and after the failover.

Monitoring the Lock Table ID During Failover with ENQT

1. Monitor the lock table ID during the failover with the following command:
    for /l %i in (1,1,100000) do enqt pf=<ERS_instance_profile> 97
    where `<ERS_instance_profile>` is the profile created during the installation of the Enqueue Replication Server.

2. Move the (A)SCS cluster group to another MSCS node to simulate an enqueue server failover while running the ENQT command.
    The output is similar to this:

    ```
    ...
    ```
    (Output before failover)
    ```
    C:\WORK\HA\ENQU-Tests>enqt pf=BUG_ERS01_PCJ2EEV6 97
    ---REQ----------------------------------------------------
    EnqId:  EnqTabCreaTime/RandomNumber = 25.10.2005 11:15:59 1130231759
    / 9288
    ...
    ```
    (Output after failover)
    ```
    C:\WORK\HA\ENQU-Tests>enqt pf=BUG_ERS01_PCJ2EEV6 97
    ---REQ----------------------------------------------------
    EnqId:  EnqTabCreaTime/RandomNumber = 25.10.2005 11:15:59 1130231759
    / 9288
    ...
    ```
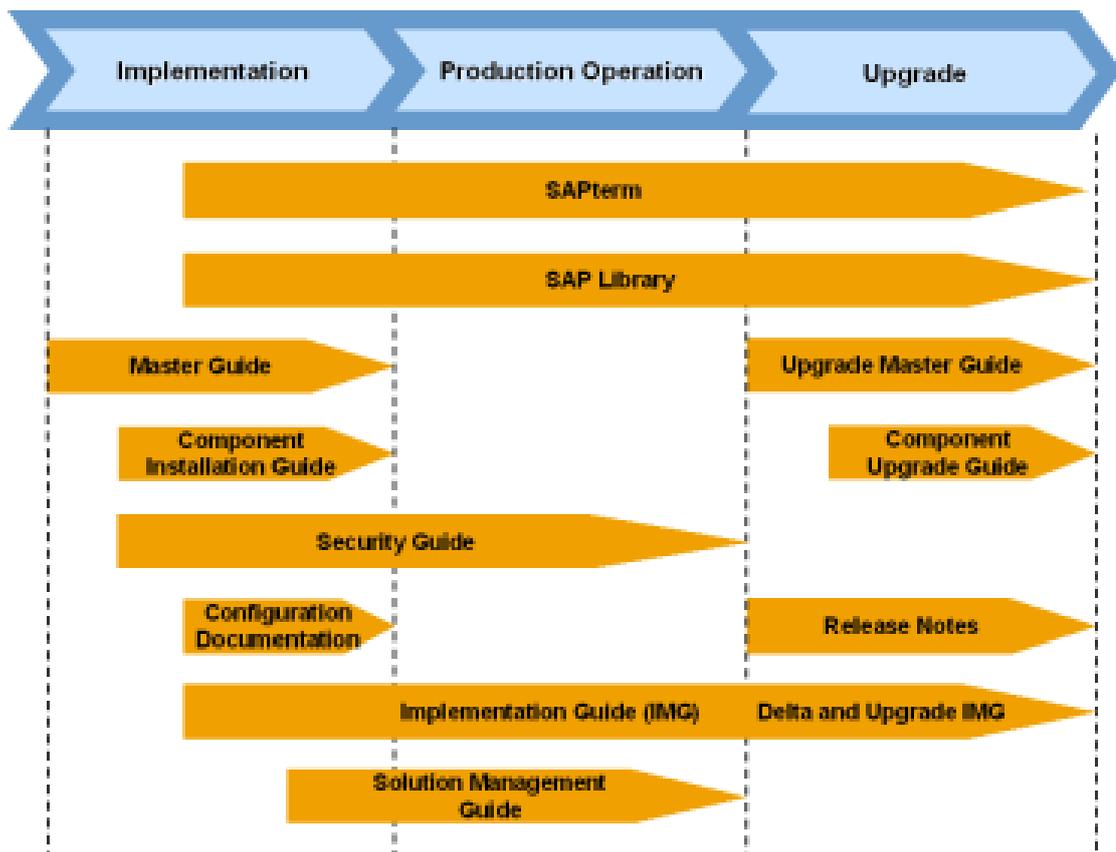
3. Make sure that the lock table ID (`ENQID`) **is the same** before and after the failover.

A Reference

A.1 The Main SAP Documentation Types

The following is an overview of the **most important** documentation types that you need in the various phases in the life cycle of an SAP solution.

Figure 19: Documentation types in the software life cycle

Cross-Phase Documentation

SAPterm—SAPterm is SAP's terminology database. It contains SAP-specific vocabulary in over 30 languages, as well as many glossary entries in English and German.

- Target group:
  - Relevant for all target groups
- Current version:
  - Located in the SAP Help Portal at help.sap.com ® *Additional Information* ® *Glossary* or *Terminology* (also available as terminology CD)

- In the SAP-System in transaction `STERM`

SAP Library—The SAP Library is a collection of function- and process-oriented documentation for SAP components. The SAP Library also contains the Business Scenario Descriptions.

- ■ Target group:
  - Consultants
  - System administrators
  - Project teams for implementations or upgrades
- ■ Current version:
  - Located in the SAP Help Portal at `help.sap.com` (also available as documentation CD)
  - Located in the SAP Service Marketplace at `service.sap.com/ibc` (only the Business Scenario Descriptions)

Implementation Guide (IMG)—The Implementation Guide is a tool for configuring the SAP system to meet customer requirements. Its structure and documentation are component-oriented.

- ■ Target group:
  - Solution consultants
  - Project teams for implementations or upgrades
- ■ Current version:
  - In the SAP menu of the SAP system under *Tools* ® *Customizing* ® *IMG*

Security Guide—The Security Guide describes the settings for a medium security level and offers suggestions for raising security levels. A collective security guide is available for the SAP NetWeaver technologies, such as the SAP Web Application Server (SAP Web AS). This document contains general guidelines and suggestions about system security. Other technologies and individual applications have a Security Guide of their own.

- ■ Target group:
  - Technology consultants
  - Solution consultants
  - Project teams for implementations or upgrades
- ■ Current version:
  - Located in the SAP Service Marketplace at `service.sap.com/securityguide`

Implementation

Master Guide—The Master Guide is the starting point for implementing an SAP solution. It lists the required SAP components, and third-party applications that are required for each Business Scenario. It provides scenario-specific descriptions of preparation, execution, and follow-up of an implementation. It also offers references to other documents, such as Component Installation Guides and SAP Notes.

- ■ Target group:
  - Technology consultants
  - System administrators
  - Project teams for implementations
- ■ Current version:
  - Located in the SAP Service Marketplace at `service.sap.com/instguides`

Component Installation Guide—The Component Installation Guide describes the technical implementation of an SAP component, taking into account the combinations of operating systems and databases. It does not describe any business-related configuration.

- Target group:
  - Technology consultants
  - Project teams for implementations
- Current version:
  - Located in the SAP Service Marketplace at `service.sap.com/instguides`

Configuration Documentation in SAP Solution Manager—SAP Solution Manager is a tool with various functions, one of its main functions being the configuration of SAP solutions and Business Scenarios. It contains IMG activities, transactions, and so on, as well as documentation. Instead of the configuration documentation in SAP Solution Manager, there may be separate Business Scenario Configuration Guides in the SAP Service Marketplace for previous shipments of the Business Scenarios.

- Target group:
  - Solution consultants
  - Project teams for implementations
- Current version:
  - In SAP Solution Manager
  - Located in the SAP Service Marketplace at `service.sap.com/ibc`

Production Operation

Solution Management Guide—The Solution Management Guide is the starting point for operating an SAP solution. The guide refers users to the tools and documentation that are needed to carry out various tasks, such as monitoring, backup / restore, master data maintenance, transports, and tests. It also refers users to other documents, for example the SAP Library, the Master Guide, and the Component Management Guides.

- Target group:
  - System administrators
  - Technology consultants
  - Solution consultants
  - Project teams for implementations or upgrades
- Current version:
  - Located in the SAP Service Marketplace at `service.sap.com/instguides`

Upgrade

Upgrade Master Guide—The Upgrade Master Guide is the starting point for upgrading the Business Scenarios of an SAP solution. It provides scenario-specific descriptions of preparation, execution, and follow-up of an upgrade. It also refers to other documents, such as the Component Upgrade Guides and SAP Notes. Instead of an Upgrade Master Guide, there may be several Business Scenario Upgrade Guides or a Solution Upgrade Guide for previous shipments of the Business Scenarios of an SAP solution.

- Target group:
  - Technology consultants
  - Project teams for upgrades

■ Current version:
  ● Located in the SAP Service Marketplace at `service.sap.com/instguides`

Component Upgrade Guide—The Component Upgrade Guide describes the technical upgrade of an SAP component, taking into account the combinations of operating systems and databases. It does not describe any business-related configuration.

■ Target group:
  ● Technology consultants
  ● Project teams for upgrades
■ Current version:
  ● Located in the SAP Service Marketplace at `service.sap.com/instguides`

Release Notes—Release Notes are documents that contain short descriptions of new features or changes in an SAP component since the previous release. Release Notes about ABAP developments enable the SAP system to generate delta and upgrade IMGs

■ Target group:
  ● Consultants
  ● Project teams for upgrades
■ Current version:
  ● Located in the SAP Service Marketplace at `service.sap.com/releasenotes`
  ● In the SAP menu of the SAP system under *Help* ® *Release Notes* (only ABAP developments)

SAP