SAP NetWeaver '04

Installation Guide

SAP® R/3 Enterprise ABAP on Windows: Oracle

Using SAP R/3 Enterprise Core 4.70, SAP R/3 Enterprise Extension Set 2.00, Service Release 1

Document Version 1.10 – August 24, 2004

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Typographic Conventions

Type Style	Represents
Example Text	Words or characters that appear on the screen. These include field names, screen titles, pushbuttons as well as menu names, paths and options.
	Cross-references to other documentation
Example text	Emphasized words or phrases in body text, titles of graphics and tables
EXAMPLE TEXT	Names of elements in the system. These include report names, program names, transaction codes, table names, and individual key words of a programming language, when surrounded by body text, for example, SELECT and INCLUDE.
Example text	Screen output. This includes file and directory names and their paths, messages, names of variables and parameters, source code as well as names of installation, upgrade and database tools.
Example text	Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Pointed brackets indicate that you replace these words and characters with appropriate entries.
EXAMPLE TEXT	Keys on the keyboard, for example, function keys (such as F2) or the Enter key.

Icons

Icon	Meaning
	Caution
	Example
	Note
	Recommendation
	Syntax

Contents

SAP R/3 Enterprise ABAP Installation on Windows: Oracle

Purpose

This documentation explains how to install the SAP R/3 Core 4.70 Extension Set 2.00 Service Release 1 (SAP R/3 Enterprise) on Windows when your database is Oracle.

SAP R/3 Enterprise is based on SAP Web Application Server (SAP Web AS) 6.40 technology, which is the underlying technology of almost all solutions of mySAP Business Suite. For more information about the technology provided by SAP Web AS, see SAP Service Marketplace at **service.sap.com/netweaver**

This documentation focuses on the ABAP part of the SAP R/3 Enterprise installation. The ABAP part is required for the installation of SAP R/3 Enterprise ABAP and SAP R/3 Enterprise ABAP+Java. For more information, see basic system variants [Page 17].

If you want to install the **Java** part of SAP R/3 Enterprise, you have to install SAP Web AS 6.40 Java. This is because the technology of the Java part of SAP R/3 Enterprise is the same as that of SAP Web AS 6.40. The installation of SAP Web AS Java 6.40 is described in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle* on SAP Service Marketplace at **service.sap.com/instguidesnw04**

Constraints

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> 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.

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

- This documentation **only** applies if you are installing an Oracle database with a Windows operating system.

- 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.

- 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 🖧 Standard Installation

This section describes how to perform a **standard** installation of SAP R/3 Enterprise.

If you want to perform a **cluster** installation, see Cluster Installation with MSCS [Page 129].

1.1 ▢ General Information

The following sections provide general information for the installation:

- SAP R/3 Enterprise Architecture [Page 9]

- New Features [Page 10]

- Naming Conventions [Page 15]

Before you start the installation, read Installation Checklists [Page 22].

1.1.1 SAP R/3 Enterprise Architecture

SAP R/3 Enterprise is built on the principle of optimizing the stable and mature core processes and infrastructure and making new enhancements optional and deployable when needed.

Tuned core, optimized for performance – based on 4.6C
(SAP R/3 Enterprise Core)

Optional new functional enhancements
(SAP R/3 Enterprise Extensions)

Application of NetWeaver
(SAP Web Application Server)
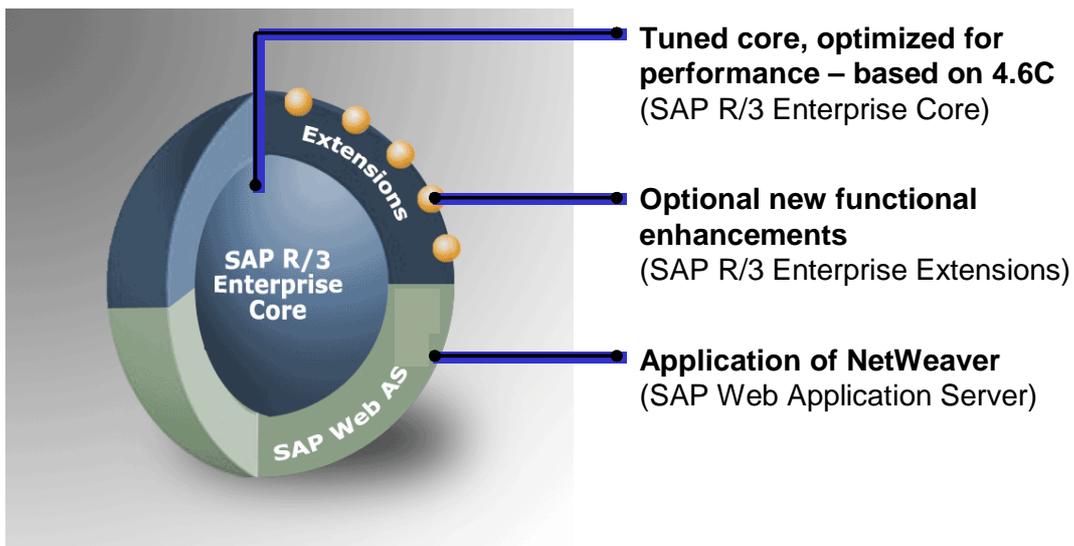
This version of SAP R/3 Enterprise consists of:

- SAP R/3 Enterprise Extension Set 2.00 SR1

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> An SAP R/3 Extension Set includes all SAP R/3 Enterprise Extensions with the same release.

- SAP R/3 Enterprise Core (4.70)

- SAP R/3 Plug-In PI 2004_1_470 SP 1 and PI_BASIS 2004_1_620 SP 3

- SAP Web Application Server 6.40 kernel

- SAP Web Application Server 6.20 ABAP Basis

All SAP R/3 Enterprise Extensions get installed, but to use the functions contained in the SAP R/3 Enterprise Extensions or industry solutions each can be activated separately. This means you can implement only those new developments that you require.

For more information about SAP R/3 Enterprise, see the *SAP Service Marketplace* at:
`service.sap.com/enterprise`

1.1.2 New Features

New Features for SAP R/3 Enterprise 4.7 Ext. Set 2.00 SR1

SAP System Installation

Area	Description
Kernel	SAP R/3 Enterprise Core 4.70 Extension Set 2.00 Service Release 1 (SR1) has a downward-compatible kernel from SAP Web AS 6.40.
New SAPinst Features	For the installation with SAPinst, you no longer have to create an installation directory as SAPinst normally creates automatically an installation directory directly below the `Program Files` directory.
Integration of SAP Internet Transaction Server (SAP ITS)	As of SAP Web AS 6.40 the SAP Internet Transaction Server (SAP ITS) is integrated into the kernel of the SAP Web Application Server 6.40 as an Internet Communication Framework (ICF) service. This service is called the *Integrated ITS*.
Integration of the installation of SAP Internet Graphic Server (IGS)	As of SAP Web AS 6.40 the installation of the SAP Internet Graphic Server (IGS) is integrated into the installation of SAP Web Application Server 6.40.
Distribution of Components	For SAP R/3 Enterprise ABAP+Java, the central services instance is always installed on the central instance host.
Installation DVDs	The installation is started from the *SAP Installation Master DVD*.

Oracle Database Installation

Area	Description
New functions in Oracle 9i	As of the installation of SAP R/3 Enterprise ABAP or ABAP+JAVA 6.40, new functions of the Oracle 9i database release are used. For more information, see **SAP Note 598678**.

1.2 Implementation Considerations

Operating System Support

Area	Description
Operating system support	• Only Windows 2000 Server and Windows Server 2003 are supported for the installation of SAP R/3 Enterprise. For more information, see SAP Service Marketplace at `service.sap.com/platforms` → *Product Availibility Matrix* • For information on Windows operating system security, see `www.microsoft.com/security`

New Features before SAP R/3 Enterprise 4.70 Ext. Set 2.00 SR1

SAP System Installation

Area	Description
Installation CDs	The installation is started from the *SAP Installation Master CD*.
New Java development environment	The SAP NetWeaver Developer Studio introduces SAP's own environment for developing Java-based, multiple-layered business applications. The new development environment is based on Eclipse, an open source product, whose open plug-in architecture provides a suitable platform for incorporating specific functions. For more information, see the SAP Library [Page 36] and choose Application Platform (SAP Web Application Server) → *Java Technology in SAP Web Application Server* → *Developers' Manual* → *The SAP NetWeaver Developer Studio*.
New installation procedure	The structure of the documentation and therefore the procedure to use it have changed significantly for this installation.
New installation tool SAPinst	SAP provides a new installation tool called System Landscape Implementation Manager, known for short as SAPinst. The main advantages compared with the previous installation tool R3SETUP are: • SAPinst does not abort due to errors. Instead, it stops the installation and you can retry the installation after having solved the problem. Alternatively, you can abort the installation manually if you want. • SAPinst continues an aborted installation directly from the point of failure. • SAPinst records installation progress in a single log file, called `sapinst.log`. • SAPinst has a graphical user interface (GUI) called the SAPinst GUI, which allows you to watch the progress of the installation and see all messages issued by SAPinst. As the SAPinst GUI is Java-based, you need a Java Runtime Environment (JRE) or a Java Development Kit (JDK). A *What's this?* help is integrated in the SAPinst GUI. To use this, choose ⟨icon⟩, and click the field for which you want more information.

Area	Description
	You can start SAPinst GUI on a remote computer if you want.
Support of Unicode	Unicode unifies the encoding systems for characters in computer systems by incorporating all characters of all character sets into a single encoding scheme.
	Without Unicode, there are hundreds of conflicting encoding systems. For example, two encoding systems can use the same numeric representation for two different characters, or use different numeric representations for the same character. Any given computer needs to support many different encoding systems. Whenever data is passed between different encoding systems or platforms, data needs to be transformed from one encoding scheme to another, risking data loss or corruption.
	Unicode removes this risk by providing a unique numeric representation for every character independent of platform, program, or language.
	We use a single-source approach for transparent Unicode support. The ABAP coding is the same and runs identically on both non-Unicode and Unicode SAP systems. The SAP kernel and executables, however, are built differently for non-Unicode and Unicode SAP systems.
	• Non-Unicode SAP system All characters are represented in binary with only one byte.
	• Unicode SAP system All characters are represented in binary with two or four bytes. This documentation describes the installation of a **Unicode** and a **non-Unicode** SAP system.
	You can find more information about Unicode SAP systems and their availability in **SAP Note** 79991 and on SAP Service Marketplace at `service.sap.com/unicode`
Integration of J2EE Engine	A Java 2 Enterprise Edition (J2EE) standards-based engine is provided and supported by SAP as a runtime environment for the Java-based components of mySAP.com. . It is an optional part of the SAP Web AS as of Release 6.20, which delivers a reliable and scalable e-business environment with native Java support that is fully J2EE-compliant.
	The J2EE Engine integrated into the SAP Web AS provides the following features:
	• J2EE compliance
	• Enterprise JavaBeans
	• Web and Internet enabling

1.2 Implementation Considerations

Area	Description
	• XML support For more information, see Application Platform (SAP Web Application Server) → *Java Technology in SAP Web Application Server* in the SAP Library [Page 36].
Support of Multiple Components on One Database	SAP offers the Installation of Multiple Components on One Database [Page 36] (MCOD). That is, you can install an additional SAP system into an existing SAP system database. For an MCOD installation, you can only combine systems for which the MCOD feature is released by SAP.

Oracle Database Installation

Area	Description
Database schema ID	The database schema ID (`<SCHEMA_ID>`) can be different from the SAP system ID (`<SAPSID>`). As a result, the name of `SAP<SAPSID>` changed to `SAP<SCHEMA_ID>`.
Oracle database version	You can find more information about the released database version for your installation on SAP Service Marketplace at `service.sap.com/platforms`
`svrmgrl` no longer exists	Server Manager `svrmgrl` has been replaced with sqlplus. If you enter `sqlplus` you are asked to enter your user name and password. To avoid this and to have the same behavior as with the previous command `svrmgrl`, enter the following to start the database administration tool: `sqlplus /nolog` If you have your own scripts using `svrmgrl` that connect to the database, you need to rewrite these accordingly: Replace the previous command `svrmgrl command=@<sql_file_name>` with `sqlplus /nolog @<sql_file_name>`
Database user internal no longer exists	User internal no longer exists in Oracle9i. To connect to the database as database administrator use the command `connect / as sysdba` The previous command `connect internal/<password>` is no longer available.
New Name for Oracle Failsafe Service	The Oracle Failsafe Service from previous Oracle releases is now called `OracleMSCSServices`. You might still see the old name in certain SAP Notes. Be sure to always use the new name `OracleMSCSServices`
Oracle sapdata file systems	Only four sapdata file systems (`sapdata1` to `sapdata4`) are required for the Oracle database.
New backup file system for Oracle offline redo logs	`<drive>\oracle\<DBSID>\oraarch` is the new standard file system for Oracle offline redo logs. The file system `\oracle\<DBSID>\saparch` still persists but now only contains `brbackup` log files.

Area	Description
Oracle tablespace implement. method	As of SAP Web AS 6.10, a new, effective method of implementing tablespaces is used. With this new tablespace implementation, only the following three database tablespaces are created: • `PSAP<SCHEMA_ID>` • `PSAP<SCHEMA_ID><RELEASE>` • `PSAP<SCHEMA_ID>USR` All three tablespaces are created with `AUTOEXTEND ON` and `EXTENT MANAGEMENT LOCAL AUTOALLOCATE`. For more information, see **SAP Note 355771**.
Database System ID	In an MCOD installation, there is an Oracle database system ID `<DBSID>` that can be different from the SAP system ID `<SAPSID>`. The database owner name (the owner of tables) changed to `sap<sapsid>`.

1.1.3 ⬜ Naming Conventions

In this documentation, the following naming conventions apply:

Terminology

The term SAP system is the same as SAP R/3 Enterprise.

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
`<SAPinst_INSTDIR>`	Installation directory for the SAP installation tool SAPinst
`<INSTDIR>`	Installation directory for the SAP system
`<DVD_DIR>`	Directory on which a DVD is mounted
`<CD_DIR>`	Directory on which a CD is mounted
`<OS>`	Operating system name within a path
`<SCHEMA_ID`	Database schema ID

1.2 Implementation Considerations

The following examples show how the variables are used:

- Log on as user `<sapsid>adm` and change to the directory di`\usr\sap\<SAPSID>`.
  If your SAP system ID is C11, log on as user `c11adm` and change to the rectory `\usr\sap\C11`.
- Change to the directory `<DVD_DIR>\IM1\NT\<platform>`.
  If the DVD is mounted on `\sapdvd1` and your operating system is Windows x86, change to `\sapdvd1\IM1\NT\I386`.

1.2 Implementation Considerations

Purpose

You and your hardware partner generally plan the system configuration well in advance of the installation, using sizing information that reflects the system workload. You use factors such as the following to design a configuration that performs well:

- The required applications

- How intensively the applications are to be used

- The number of users

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>
> As the system configuration fundamentally influences the installation procedure, it is important to have a clear configuration plan before you start the installation.

Process Flow

1. You choose the basic system variant [Page 17] of your SAP system.

2. You choose the required installation components [Page 17].

3. You decide how to distribute the required installation components to the available hosts. This depends on your basic installation type:

   o Distribution of Installation Components SAP R/3 Enterprise ABAP [Page 20]

   o Distribution of Installation Components for SAP R/3 Enterprise ABAP+Java [Page 19]

   o Distribution of Installation Components for SAP Web AS Java for SAP R/3 Enterprise [Page 21]

1.2.1 Basic System Variants

There are the following basic system variants of SAP R/3 Enterprise:

- **SAP R/3 Enterprise ABAP**

  This system variant consists of the ABAP installaton of SAP R/3 Enterprise. There is **no** J2EE Engine.

- **SAP R/3 Enterprise ABAP+Java**

  This system variant consists of the ABAP installaton of SAP R/3 Enterprise and the J2EE Engine. You can then operate **both** the ABAP Engine and the J2EE Engine on the SAP system.

- **SAP Web AS Java for SAP R/3 Enterprise**

  This system variant consists of the J2EE Engine and auxiliary services. There is **no** ABAP Engine.

1.2.2 Installation Components

Definition

A minimum SAP system consists of a central instance, a database instance, and – if you install a SAP system with the J2EE Engine – a central services instance. You can then install

optional dialog instances on different hosts after you have completed the installation of the central instance, the central services instance (if required), **and** the database.

> You can think of an SAP instance – central instance, central services instance, database instance, dialog instance, or gateway instance – as a group of processes that are started and stopped at the same time. Every instance has a two-digit identifier between 00 and 97 that must be unique on a computer.

Use

When you set up an SAP system, you need to install the main components that enable the system to operate:

- **Central Instance**

  If you install a SAP system with the J2EE Engine, the Software Deployment Manager (SDM) is part of the J2EE Engine of the central instance.

- **Central services instance**

  If you install an SAP system with the J2EE Engine, also a central services instance (SCS) is part of your SAP system. The central services instance forms the basis of communication and synchronization for the Java cluster. A central services instance consists of the message service and the enqueue service:

  - The *message service* keeps a list of the J2EE dispatchers and J2EE server processes of the Java cluster. It provides the infrastructure for data exchange (small datasets only) between the participating nodes. The message service also supplies information to the SAP Web Dispatcher about load balancing between multiple J2EE instances.

  - The *enqueue service* manages logical database locks, which are set by the executed application program in a J2EE server process. The enqueue service also synchronizes data across the Java cluster.

  For more information, see the following in the <u>SAP Library [Page </u>36<u>]</u>:

  Application Platform (SAP Web Application Server) → Java Technology in SAP Web Application Server → Architecture Manual → Java Cluster Architecture → Central Services

- **Database instance**

  The J2EE Engine has its own database schema. Therefore, a database instance is also a mandatory installation component for the installation of an SAP Web AS Java system.

  For the installation of SAP R/3 Enterprise ABAP+Java, both the ABAP and the J2EE schema are installed in the same database.

- **Dialog instances**, if required

  Dialog instances are SAP instances that include only:

  - Dispatcher, IGS, and CCMS agents

  - SAP R/3 Enterprise ABAP+Java and SAP Web AS Java: J2EE server processes

  - SAP R/3 Enterprise ABAP+Java and SAP R/3 Enterprise ABAP: gateway and certain ABAP work processes (dialog, batch, spool, or update)

  Dialog instances are installed on application servers.

The dialog instances of SAP Web AS Java for SAP R/3 Enterprise are called **J2EE dialog instances**.

> If information is valid for both dialog instances and J2EE dialog instances, *(J2EE) dialog instance* is written in this documentation.

- **Gateway instance**, if required

  It is possible to install an SAP instance of an SAP system based on SAP R/3 Enterprise ABAP exclusively as a standalone gateway. This type of instance does not contain normal work process types (dialog, background, update, enqueue or spool). Only the gateway process (gwrd) is started. If there is an SNA connection to an R/2 system, gateway work processes (gwwp) are also started.

- **Front ends**

  The installation of front ends for the SAP system is described separately in the documentation [Page 35] *SAP Front End Installation Guide*.

- **SAP NetWeaver Developer Workplace**

  The SAP NetWeaver Developer Workplace consists of a special SAP Web AS Java system in addition to the SAP NetWeaver Developer Studio, SAP's Java Integrated Development Environment (IDE). If required, you can install the Java IDE separately.

  > The installation of the SAP NetWeaver Developer Workplace is **not** described in this installation documentation. For its installation, see the documentation [Page 35] *Installation Guide – SAP NetWeaver Developer Workplace*.

- **SAP NetWeaver Developer Studio**

  The SAP NetWeaver Developer Studio is SAP's own environment for developing Java-based, multi-layered business applications. The new development environment is based on Eclipse, an open source product. The open plug-in architecture of Eclipse provides a suitable platform for incorporating specific functions.

  For more information, see the following in the SAP Library [Page 36]:

  Application Platform (SAP Web Application Server) → Java Technology in SAP Web Application Server → Developers' Manual → The SAP NetWeaver Developer Studio

  You can install the SAP NetWeaver Developer Studio in either of the following ways:

  - Separately

    For more information, see the documentation [Page 35] *Installation Guide – SAP NetWeaver Developer Studio.*

  - As part of the SAP NetWeaver Developer Workplace

    For more information, see the documentation [Page 35] *Installation Guide – SAP NetWeaver Developer Workplace.*

1.2.3 Distribution of Installation Components: SAP R/3 Enterprise ABAP

Minimal Component Distribution

The minimal system consists of **all mandatory** installation components [Page 17] installed on a **single host**.
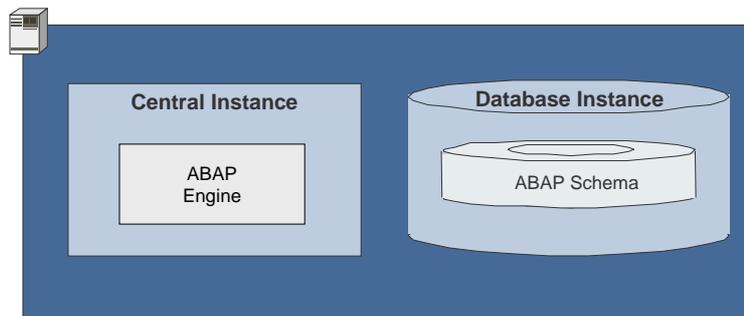
Maximal Component Distribution

The maximal scenario consists of **all mandatory** installation components [Page 17] installed on **separate hosts**.
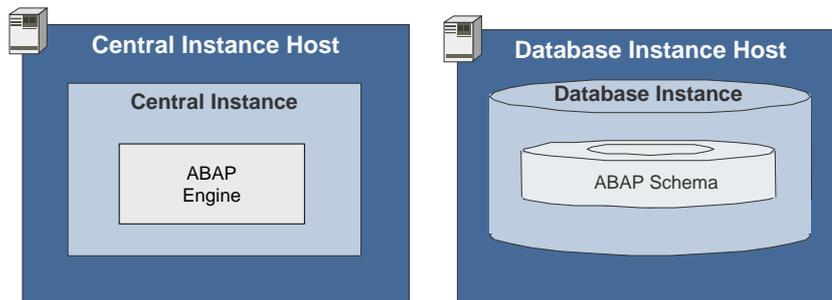
1.2.4 Distribution of Installation Components: SAP R/3 Enterprise ABAP+Java

- ABAP and J2EE data normally reside in the **same** database.
- For SAP R/3 Enterprise ABAP+Java, the central services instance is always installed on the central instance host.

Minimal Component Distribution

The minimal system consists of **all mandatory** installation components [Page 17] installed on a **single host**.
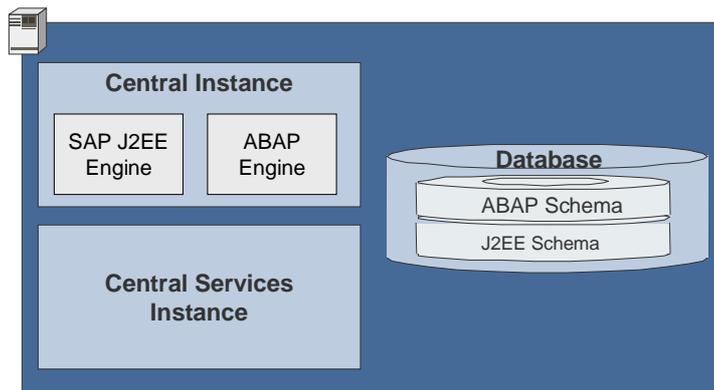
Maximal Component Distribution

The maximal scenario consists of **all mandatory** installed on **two hosts**.
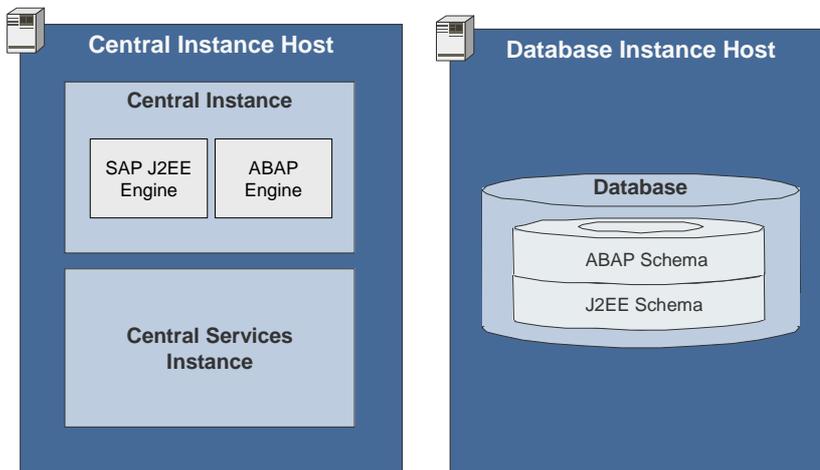
1.2.5 Distribution of Installation Components: SAP Web AS Java for SAP R/3 Enterprise

The distribution of installation components for *SAP Web AS Java for SAP R/3 Enterprise* and the installation of SAP Web AS Java are described in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle* on SAP Service Markteplace at `service.sap.com/instguidesnw04`.

1.3 ⊞ Installation Checklists

Purpose

You use the tables in the following sections as checklists to navigate through the installation when you install your SAP system.

Prerequisites

You have decided how to implement your SAP system [Page 17].

Process Flow

1. You choose and print out the relevant checklists for one of the following system variants:

   o **SAP R/3 Enterprise ABAP**:

Installation Option	Installation Checklist
SAP R/3 Enterprise as a **central system**: Central instance and database instance of the SAP R/3 Enterprise system are installed on **one** host	Installation Checklist for SAP R/3 Enterprise (Central System) [Page 24]
SAP R/3 Enterprise as a **distributed** system: Central instance and database instance of the SAP R/3 Enterprise system are installed on **multiple** hosts	Installation Checklist for SAP R/3 Enterprise (Distributed System) [Page 27]
Dialog Instance(s) for SAP R/3 Enterprise	Installation Checklist for a Dialog Instance [Page 31]
Gateway Instance(s)	Installation Checklist for a Gateway Instance [Page 33]

   o **SAP R/3 Enterprise ABAP+Java**:

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   For the installation of SAP R/3 Enterprise ABAP+Java, also see the installation checklists in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle*.

Installation Option	Installation Checklist
SAP R/3 Enterprise as a **central** system: Central instance, central services instance and database instance of the SAP R/3 Enterprise system are installed on a **single** host	1. Installation Checklist for SAP R/3 Enterprise (Central System) [Page 24] 2. *Installation Checklist for SAP Web AS – J2EE Add-In (Central System)* from the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle.*
SAP R/3 Enterprise as a **distributed** system: Central instance, central services instance and database instance of the SAP R/3 Enterprise system are installed on **multiple** hosts	1. Installation Checklist for SAP R/3 Enterprise (Distributed System) [Page 27] 2. *Installation Checklist for SAP Web AS – J2EE Add-In (Distributed System)* from the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle.*
Dialog Instance(s) for the SAP R/3 Enterprise system	1. Installation Checklist for a Dialog Instance [Page 31] 2. *Installation Checklist for a Dialog Instance for SAP Web AS – J2EE Add-In* available in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle.*
Gateway Instance(s)	Installation Checklist for a Gateway Instance [Page 33]

o **SAP Web AS Java for SAP R/3 Enterprise**

   The installation of the system variant *SAP Web AS Java for SAP R/3 Enterprise* is **not** described in this installation guide. Instead, see the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle.* You need to perform the installation option *SAP Web AS – J2EE system.*

2. You follow the installation sequence exactly as shown in the checklists:

   a. If a step is required for your installation, you follow the link for that step to the corresponding section.

   b. You perform the procedure described there.

   c. After successfully completing the installation step, you mark the corresponding entry in the printed table with ✔ to log the progress of your installation.

d. You proceed with the next step listed in the checklist.

1.3.1 Installation Checklist for SAP R/3 Enterprise (Central System)

Purpose

You use the following checklist when you want to install a central system (you install a central instance and a database instance on the **central system host**).

Process Flow

Installation Planning

✔	Action
	You obtain the required documentation [Page 34] ⚠️ If you want to install a Unicode SAP system, make sure that you read **SAP Note 544623** and perform the additional installation steps described there.
	You decide, if you want to install multiple components on one database (MCOD) [Page 36] ⚠️ • If you decide to turn off database logging during the database load phase of the installation, you need to plan downtime for all connected database instances. • Be aware that you **cannot** install multiple components in one database in a cluster environment. • Be aware that you **cannot** install a Unicode SAP system with a non-Unicode SAP system in one database (MCOD).
	You decide if you want to use Lightweight Directory Access Protocol (LDAP) [Page 39] for SAP Logon or the Microsoft Management Console (MMC).
	You decide on the optimal configuration for your system [Page 41]
	You check the hardware and software requirements [Page 47]

Installation Preparations

✔	Action
	Make sure that the front-end software is installed on **at least one** host machine in your system environment. To simplify administration of your SAP system, we recommend you to do this on the central instance host. For more information on installing the front-end software, see the separate documentation [Page 35]: • SAP Front End Installation Guide (English version) • *SAP Frontend-Installationsleitfaden* (German version)
	Check for the Windows file system [Page 56]

✔	Action
	If required, check the Windows domain structure [Page 56]
	Reduce the size of the file cache [Page 57]
	Grant user rights for the installation [Page 57]
	If required, perform a domain installation without being a domain administrator [Page 58]
	Choose the SAP system IDs [Page 61]
	Prepare the SAP system transport host [Page 62]
	You check **SAP Note 306408** if you require an interim patch for the Oracle database installation. In this case, make sure you have the corresponding Perl version as stated in that SAP Note.
	If required, you prepare your system for SAPinst [Page 64]
	Prepare the installation CDs and DVDs [Page 66]
	If you decided to use LDAP [Page 39], prepare the active directory for use with the SAP system [Page 39]

Installation Process

✔	Action
	Install the Oracle database server software [Page 71]
	Run SAPinst [Page 73] and select *SAP R3E 4.7x200 SR1* → *ABAP System* → *<Unicode or non-Unicode>* → *Install a Central Instance* to install the central instance.
	Check the input for the installation [Page 77]
	Run SAPinst [Page 73] and select *SAP R3E 4.7x200 SR1* → *ABAP System* → *<Unicode or non-Unicode>* → *Install a Database Instance* to install the database instance If you want to install an additional SAP system into an existing database (MCOD), see Installation of Multiple Components On One Database [Page 36].
	Check the input for the installation [Page 77]

Post-Installation Activities

✔	Action
	Check that you can start and stop the SAP system [Page 92]
	Check that you can log on to the SAP system [Page 93].
	Install the SAP license [Page 94]
	Check the SAP system services [Page 94]
	Install the SAP online documentation [Page 95]
	Configure SAProuter and SAPNet – R/3 Frontend [Page 96].
	Configure the Transport Management System [Page 96].

✔	Action
	Perform basic operations [Page 97].
	Check and, if required, adapt the configured number of work processes [Page 97].
	If required, install additional languages [Page 98].
	You activate or deactivate the integrated Internet Transaction Server (ITS) [Page 98].
	If required, you import Support Packages [Page 99].
	If required, set up Secure Single Sign-On [Page 99] or Kerberos Single Sign-On [Page 104].
	Perform the client copy [Page 109]
	If you install SAP R/3 Enterprise as basis for an SAP component that uses the Knowledge Provider (KPRO) component (for example, SAP BW or SAP KW), you schedule asynchronous indexing and deindexing [Page 109] using the report RSTIRIDX.
	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 hosts.
	Unicode SAP system installation only: You perform the post-installation steps described in **SAP Note 544623**.
	Perform a full installation backup [Page 111]. If you install SAP R/3 Enterprise ABAP+Java, you can perform the full installation backup **after** the installation of the J2EE Engine.
	Change passwords of created users

Additional Steps

✔	Action
	If you want to install SAP R/3 Enterprise ABAP+Java, perform the steps in the "Installation Checklist for SAP Web AS – J2EE Add-In (Central System)" available in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle* SAP_BAS_620 and SAP_ABA_620 SP41 are prerequisites for the J2EE Add-In installation.
	After the central system installation, you can install the following if required: • Dialog Instance [Page 31] • Gateway Instance [Page 33]
	Once you have completed and checked the SAP system installation, you need to prepare the SAP system for using business applications. This process includes customizing the basis system and the various business components. For more information, see *Solution Life Cycle Management → Customizing* in the SAP Library [Page 36].

1.3.2 Installation Checklist for SAP R/3 Enterprise (Distributed System)

Purpose

You use the following checklist when you want to install a distributed SAP system (you install a central instance on the **central instance host** and the database instance on the **database instance host**).

Process Flow

1. You perform the following steps on the **central instance host**:

a. Installation Planning

✔	Action
	Obtain the required documentation [Page 34] If you want to install a Unicode SAP system, make sure that you read SAP N**ote 544623** and perform the additional installation steps described there.
	Decide, if you want to install multiple components on one database (MCOD) [Page 36]. • If you decide to turn off database logging during the database load phase of the installation, you need to plan downtime for all connected database instances. • Be aware that you **cannot** install a Unicode SAP system with a non-Unicode SAP system in one database (MCOD).
	Decide on the optimal configuration for your system [Page 41]
	You decide if you want to use Lightweight Directory Access Protocol (LDAP) [Page 39] for SAP Logon or the Microsoft Management Console (MMC).
	Check the hardware and software requirements [Page 47]

b. Installation Preparations

✔	Action
	Make sure that the front-end software is installed on **at least one** host machine in your system environment. To simplify administration of your SAP system, we recommend you to do this on the central instance host. For more information on installing the front-end software, see the separate documentation [Page 35]: • SAP Front End Installation Guide (English version) • *SAP Frontend-Installationsleitfaden* (German version)
	Check for the Windows file system [Page 56]

1.3 Installation Checklists

✔	Action
	If required, check the Windows domain structure [Page 56]
	Reduce the size of the file cache [Page 57]
	Grant user rights for the installation [Page 57]
	Choose the SAP system IDs [Page 61] ⚠️ This action is not required if you install a system into an existing database (MCOD).
	Prepare the SAP system transport host [Page 62]
	If required, prepare your system for SAPinst [Page 64]
	Prepare the installation CDs and DVDs [Page 66]
	If you decided to use LDAP [Page 39], prepare the active directory for use with the SAP system [Page 39]

Installation Process

✔	Action
	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 `brtools.exe`.
	Install the Oracle database client software [Page 71]
	Run SAPinst [Page 73] and select *SAP R3E 4.7x200 SR1* → *ABAP System* → *<Unicode or non-Unicode>* → *Install a Central Instance* to install the central instance.
	Check the input for the installation [Page 77]

2. You perform the following steps on the **database instance host**:

⚠️

If you want to install an additional SAP system into an existing database (MCOD), see Installation of Multiple Components On One Database [Page 36].

a. Installation Planning

✔	Action
	Check the hardware and software requirements [Page 47]

b. Installation Preparations

✔	Action
	You check **SAP Note 306408** if you require an interim patch for the Oracle database installation. In this case, make sure you have the corresponding Perl version as stated in that SAP Note.
	Grant user rights for the installation [Page 57]
	If required, you prepare your system for SAPinst [Page 64]
	Prepare the installation CDs and DVDs [Page 66]

c. Installation Process

✔	**Action**
	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 `brtools.exe`.
	Install the Oracle database server software [Page 71]
	Run SAPinst [Page 73] and select *SAP R3E 4.7x200 SR1* → *ABAP System* → *<Unicode or non-Unicode>* → *Install a Database Instance* to install the database instance. ⚠️ If you want to install an SAP system into an existing database, see Installation of Multiple Components on One Database [Page 36]
	Check the input for the installation [Page 77]

d. Post-Installation Activities

✔	**Action**
	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 hosts.

3. You perform the following steps on the **central instance host**:

a. Post-Installation Activities

To complete the installation, you have to perform a number of actions. Some of these actions are mandatory, others are optional and serve to activate features that might be useful.

✔	**Action**
	Start and stop the SAP system [Page 92]
	Log on to the SAP system [Page 93].
	Install the SAP license [Page 94]
	Check the SAP system services [Page 94]
	Install the SAP online documentation [Page 95]
	In a standalone database system, after you have installed the database instance, check the RFC destination [Page 95]
	Configure SAProuter and SAPNet – R/3 Frontend [Page 96].
	Configure the Transport Management System [Page 96].
	Perform basic operations [Page 97].
	Check and, if required, adapt the configured number of work processes [Page 97].
	If required, install additional languages [Page 98].
	You activate or deactivate the integrated Internet Transaction Server (ITS) [Page 98].
	If required, you import Support Packages [Page 99].

✔	Action
	If required, set up Secure Single Sign-On [Page 99] or Kerberos Single Sign-On [Page 104].
	Unicode SAP system installation only: You perform the post-installation steps described in **SAP Note 544623**.
	Perform the client copy [Page 109]
	If you install SAP R/3 Enterprise as basis for an SAP component that uses the Knowledge Provider (KPRO) component (for example, SAP BW or SAP KW), you schedule asynchronous indexing and deindexing [Page 109] using the report RSTIRIDX.
	Perform a full installation backup [Page 111] If you install SAP R/3 Enterprise ABAP+Java, you can perform the full installation backup after the installation of the J2EE Engine.
	Change passwords of created users [Page 112].

b. Additional Steps

✔	Action
	If you want to install SAP R/3 Enterprise ABAP+Java, perform the steps in the *Installation Checklist for SAP Web AS – J2EE Add-In (Distributed System)* available in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle*. SAP_BAS_620 and SAP_ABA_620 SP41 are prerequisites for the J2EE Add-In installation.
	After the central instance installation you can install the following if required: • Dialog Instance [Page 31] • Gateway Instance [Page 33] Make sure to install the standalone gateway instance on the database instance host for using the RFC functions, for example transaction DB13.
	Once you have completed and checked the SAP system installation, you need to prepare the SAP system for using business applications. This process includes customizing the basis system and the various business components. For more information, choose *Solution Life Cycle Management → Customizing* in the SAP Library [Page 36]

1.3.3 Installation Checklist for a Dialog Instance

Purpose

You use the following checklist when you want to install a dialog instance on the **dialog instance host**.

Process Flow

Installation Planning

✔	Action
	Obtain the required documentation [Page 34]
	Check the hardware and software requirements [Page 47]

Installation Preparations

✔	Action
	If required, check the Windows file system [Page 56]
	Check the Windows domain structure [Page 56]
	Reduce the size of the file cache [Page 57]
	Grant user rights for the installation [Page 57]
	If required, you prepare your system for SAPinst [Page 64]
	Prepare the installation CDs and DVDs [Page 66]

Installation Process

✔	Action
	Install the Oracle database client software [Page 71]
	Run SAPinst [Page 73] and select *SAP R3E 4.7x200 SR1 → ABAP System → <Unicode or non-Unicode> → Install a Dialog Instance* to install the dialog instance
	Check the input for the installation [Page 77]

Post-Installation Activities

✔	Action
	Start and stop the SAP system [Page 92]
	Log on to the SAP system [Page 93].
	You activate or deactivate the integrated Internet Transaction Server (ITS) [Page 98].
	If required, you import Support Packages [Page 99].
	If required, set up Secure Single Sign-On [Page 99] or Kerberos Single Sign-On [Page 104].
	Perform a full installation backup [Page 111]
	When the newly installed SAP system goes into production, we recommend that you immediately change passwords of created users [Page 112] according to the

✔	**Action**
	SAP Security Guide.

Additional Steps

✔	**Action**
	If you want to install a dialog instance for SAP R/3 Enterprise ABAP+Java, perform the steps in "Installation Checklist for a Dialog Instance for SAP Web AS – J2EE Add-In" available in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle.* ⚠️ SAP_BAS_620 and SAP_ABA_620 SP41 are prerequisites for the J2EE Add-In installation.
	After the dialog instance installation, you can install the following if required: • An additional dialog instance [Page 31] • Gateway Instance [Page 33]

1.3.4 ⬚ Installation Checklist for a Gateway Instance

Purpose

You use the following checklist when you want to install a gateway instance on the **gateway instance host**.

Planning

✔	Action
	Obtain the required documentation [Page 34].
	Check the hardware and software requirements [Page 47]

Installation Preparations

✔	Action
	Check the Windows file system [Page 56]
	Check the Windows domain structure [Page 56]
	Grant user rights for the installation [Page 57]
	Choose the SAP system IDs [Page 61]
	If required, you prepare your system for SAPinst [Page 64]
	Prepare the required installation CDs and DVDs [Page 66]

Installation Process

✔	Action
	Run SAPinst [Page 73] from the Presentation DVD and select *Install SAP Gateway* to install the gateway instance
	Check the input for the installation [Page 77]

Post-Installation Activities

	Start and stop the Gateway instance. For more information, see, Start and stop the SAP system [Page 92]
	Log on to the SAP system [Page 93].
	You activate or deactivate the integrated Internet Transaction Server (ITS) [Page 98].
	If required, you import Support Packages [Page 99].
	Perform a full installation backup [Page 111]
	When the newly installed SAP system goes into production, we recommend that you immediately change passwords of created users [Page 112] according to the SAP Security Guide.

1.4 Installation Planning

⚠️

> Make sure that you read the Installation Checklists [Page 22] before you start
> the installation planning.

1.4.1 Required Documentation

The following sections describe the documentation you require for the installation.

- SAP Installation Notes

- Information on SAP Service Marketplace

- Accessing the SAP Library

1.4.1.1 SAP Installation Notes

You **must** read the following SAP Notes **before** you start the installation. They contain the
most recent information regarding 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 on
SAP Service Marketplace at `service.sap.com/notes`

Note Number	Title	Description
751411	INST: SAP R/3 Enterprise 4.70 Ext. Set 2.00 SR1 on Windows	Windows-specific information about the SAP system installation and corrections to this documentation.
675940	SAP Web AS 6.40 Installation on Windows: Oracle	Oracle-specific information about the SAP system installation and corrections to this documentation
675938	SAP Web AS 6.40 ABAP Installation on Windows	Windows-specific information about the SAP system installation and corrections to this documentation.
544623	New Installation of Unicode SAP systems	This SAP Note contains supplementary information about Unicode-specific installation steps.
611361	Hostnames of SAP servers	Requirements concerning host name length and allowed characters for SAP server hosts.
598678	Composite SAP Note: New functions in Oracle 9i	Information about new functions in Oracle 9i that are used as of the installation of Web AS ABAP or SAP Web AS ABAP+Java 6.40.
79991	Multi Language Support / Unicode	Information about Unicode SAP systems and their availability. It is only required if you plan to install a Unicode SAP system.

Note Number	Title	Description
73606	R/3 language combinations (non-Unicode)	Information about multiple languages on one SAP system
42305	RSCPINST (NLS installation tool)	Information about language and code page settings in your SAP system.

1.4.1.2 Information on SAP Service Marketplace

Information on the following areas is available on *SAP Service Marketplace*.

Description	Internet Address	Title
SAP Notes	`service.sap.com/notes`	–
Released platforms	`service.sap.com/platforms`	–
List of media for installation or upgrade of SAP R/3 Enterprise	`service.sap.com/instguides` → *SAP Components* → *SAP R/3 Enterprise* → *SAP R/3 Enterprise Core 4.70 / Ext. Set 2.00 (SR1)*	*Media Information for mySAP R/3 Enterprise*
Installation of the Java system for an SAP R/3 Enterprise system	`service.sap.com/instguidesNW04` → *Installation*	*Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle*
Patching of SAP Netweaver'04 scenarios	`service.sap.com/instguidesNW04` → *Operations*	*Support Package Stack Guide – SAP Netweaver'04 Support Package Stack <current version>*
Upgrade to SAP R/3 Enterprise Component	`service.sap.com/instguides` → *SAP Components* → *SAP R/3 Enterprise* → *SAP R/3 Enterprise Core 4.70 / Ext. Set 2.00 (SR1)*	*Upgrade to SAP Web Application Server <Platform>: <Database>*
Installation of a dialog instance (ABAP) or a gateway instance as part of an SAP system upgrade	`service.sap.com/instguidesNW04` → *Installation*	*Installation Guide – Additional Instances on <Platform>*
Installation of SAP NetWeaver Developer Workplace	`service.sap.com/instguidesNW04` → *Installation*	*Installation Guide – SAP NetWeaver Developer Workplace*
Installation of SAP NetWeaver Developer Studio	`service.sap.com/instguidesNW04` → *Installation*	*Installation Guide – SAP NetWeaver Developer Studio*
Installation of the SAP System Landscape Directory (SLD)	`service.sap.com/instguidesNW04` → *Installation*	*Post-Installation Guide – SAP System Landscape Directory on SAP Web AS Java 6.40*

Description	Internet Address	Title
Unicode SAP systems and their availability	`service.sap.com/unicode` See also **SAP Note 79991**.	–
Technical infrastructure – configuration scenarios and related aspects such as security, load balancing, availability, and caching	`service.sap.com/ti`	–
Network infrastructure	`service.sap.com/network`	–
System sizing	`service.sap.com/sizing`	*Quick Sizer* tool
Front-end installation	`service.sap.com/instguidesNW04` → *Installation*	*Front End Installation Guide* (this guide is available on the *SAP Presentation DVD*)
High availability	`service.sap.com/ha`	–
Homogeneous and heterogeneous system copy	`service.sap.com/instguidesNW04` → *Installation*	*Homogeneous and Heterogeneous System Copy for SAP Systems based on SAP Web Application Server 6.40*
Security	`service.sap.com/security` For information on Windows operating system security, see `www.microsoft.com/security`	–
Information on SAP Support Package Stacks	`Service.sap.com/sp-stacks`	–

1.3.1.3 Accessing the SAP Library

For more information on SAP NetWeaver, access the SAP Library from the **SAP Help Portal** at `help.sap.com/nw04`

1. Select the required language.

2. Choose *SAP NetWeaver*.

In the SAP Help Portal at help.sap.com you can also find online documentation for all SAP Solutions.

1.4.2 ⚙ Installation of Multiple Components in One Database

Use

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

> You install an SAP R/3 central system and an SAP CRM central system in a single database.

MCOD is scheduled to be 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.

Prerequisites

- For more information on MCOD and its availability on different platforms, see *SAP Service Marketplace* at `service.sap.com/mcod`

- 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 SAP Service Marketplace at `service.sap.com/sizing`

Features

> 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.

- 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.

- 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.

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

Constraints

- 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

  You can use SAPNet – R/3 Frontend to request help with these tasks.

- For UNIX systems only

  When you use `stopsap` in an MCOD system with two central instances, only one central instance and the database are shut down. Therefore, you must first stop the other SAP system with `stopsap R3` or make sure that it has already been stopped.

- A Unicode SAP system **cannot** be installed with a non-Unicode SAP system in one database (MCOD).

Activities

All differences in the installation procedure for MCOD are marked in the corresponding sections of this documentation.

Installing the First SAP System into a New Database

1. Perform the central instance installation as usual.

   You install the central instance with SAP system ID `C11`.

2. Start the database instance installation.

3. When SAPinst prompts for *Database Instance Type*, choose *Install (first) SAP System into a new database*.

   You install the database instance `C11`.

   On some platforms, you can choose a database instance ID that is different from the SAP system ID, for example D11.

4. Finish the installation.

Installing an Additional SAP System into an Existing Database

1. Perform the central instance installation as usual.

   You install the central instance with SAP system ID `C12`.

2. When SAPinst prompts for the Name of the database instance, enter exactly the database instance <DBSID> of the existing – that is, the first – database.

3. Start the database instance installation.

4. When you are prompted for Database Instance Type, choose Install (additional) SAP System into an existing database.

5. When SAPinst prompts you for the Name of the database instance, enter exactly the database instance <DBSID> of the existing (first) database.

When SAPinst prompts for the database instance name, enter `C11`.

6. Finish the installation.

Due to the MCOD installation, some installation steps are not required and therefore do not appear. These steps are marked in section "Input for the Installation."

1.4.3 Integration of LDAP Directory Services

Use

The Lightweight Directory Access Protocol (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 need only maintain data once, so 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.

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**.

Integration

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)

1.4 Installation Planning

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 *R/3 System Information in Directory Services* on SAP Service Marketplace at **service.sap.com/msplatforms** → *Microsoft* → *Windows Server*

Prerequisites

You can only configure the SAP system for Active Directory services or other LDAP directories if these are **already available** on the network. The Active Directory is a feature of Windows 2000 or higher and 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

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 NT4.0 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 analyses 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 EBP, SAP APO, 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.

Activities

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 the R3SETUP tool with the option *Configure Active directory for SAP*.

For more information, see Preparing the Active Directory for Use with the SAP System [Page 68]

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.

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.

3.   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.

4.   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 *R/3 System Information in Directory Services* on SAP Service Marketplace at **service.sap.com/msplatforms** → *Microsoft* → *Windows Server*

1.4.4 System Configuration

System Configuration

- You and your hardware partner generally plan the system configuration before the installation. Key aspects of the planning include:

    o   Central system or standalone database system

    o   Domain or local installation

    o   How many dialog instances and front ends are required

- You and your hardware partner work out a high-performance configuration based on sizing information that reflects the system workload, such as:

    o   The set of applications to be deployed

    o   How intensively the applications are to be used

    o   The number of users

- You decide whether you want to perform a local or a domain installation:

    o   Local installation

        You need to be `Local Administrator` of the host 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** host, you can perform a local installation.

        Performing a local installation for a distributed system leads to authorization problems that have to be resolved.

    o   Domain installation

        You need to be `Domain Administrator` of the domain involved, and all hosts 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** host, we strongly recommend a domain installation.

        A domain installation requires a domain controller to store user and account information centrally for the whole system. For performance and security reasons the domain controller must **not** be located on a host where the central instance or database is running.

        If for any reason, you are not granted domain administration rights, you can perform the installation as a domain user who is a member of the local administrator 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 59].

    See also:

1.4.4.1 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.

> 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.

Distribution of Components to Disks
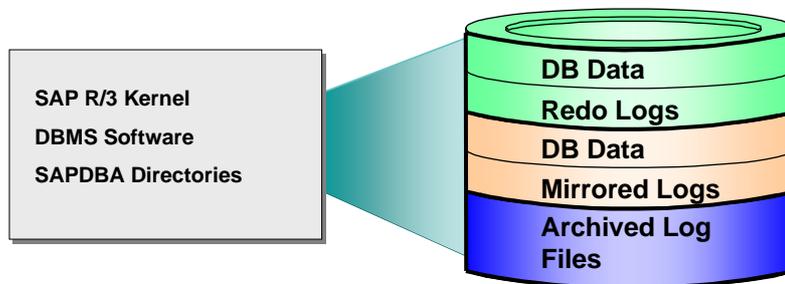
Distribution of Directories to Disks

Disk	Directories
Disk 1	\ORACLE\<DBSID>\920 \ORACLE\<DBSID>\sapreorg \ORACLE\<DBSID>\origlogA \ORACLE\<DBSID>\origlogB \ORACLE\<DBSID>\sapdata1 \ORACLE\<DBSID>\sapdata2

Disk 2	`\ORACLE\<DBSID>\mirrlogA` `\ORACLE\<DBSID>\mirrlogB` `\ORACLE\<DBSID>\saptrace` `\ORACLE\<DBSID>\sapbackup` `\ORACLE\<DBSID>\sapcheck` `\usr\sap` `\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.

1.4.4.2   SAP Directories

Definition

The following SAP directory is created during the central instance installation:

- `\usr\sap`
    - o   Created on the central instance
    - o   Contains general SAP software

This directory is global, that is, it is accessed by all of the hosts in the SAP system. Therefore, it has a name that follows the Universal Naming Convention (UNC).

We distinguish between a global, local, and database host:

- Global host

    Machine on which the central instance is running

- Local host

    Current machine on which an SAP instance is running

- DB host

    Machine on which the database server is running

Use

\usr\sap

The SAP software is stored in the `\usr\sap` directory:

- On global hosts, the \usr\sap directory contains global and local (instance-specific) data.

- On local hosts, \usr\sap contains only instance-specific data and copies of the SAP executables. The executables on the local host are replicated from those on the global host each time the local instance is started.

The installation program creates the \usr\sap directory on the global host and shares it with the names sapmnt and saploc. The same directory on the local host is shared as saploc.

> 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.
>
> If you create the subdirectory ......\SYS (global data) locally on application or front-end servers, you have to distribute the software for the SAP system manually when upgrading to a new SAP release. SAP does **not** support this.

Structure

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

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

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

32-Bit Directory Structure on the Global (Central Instance) Host
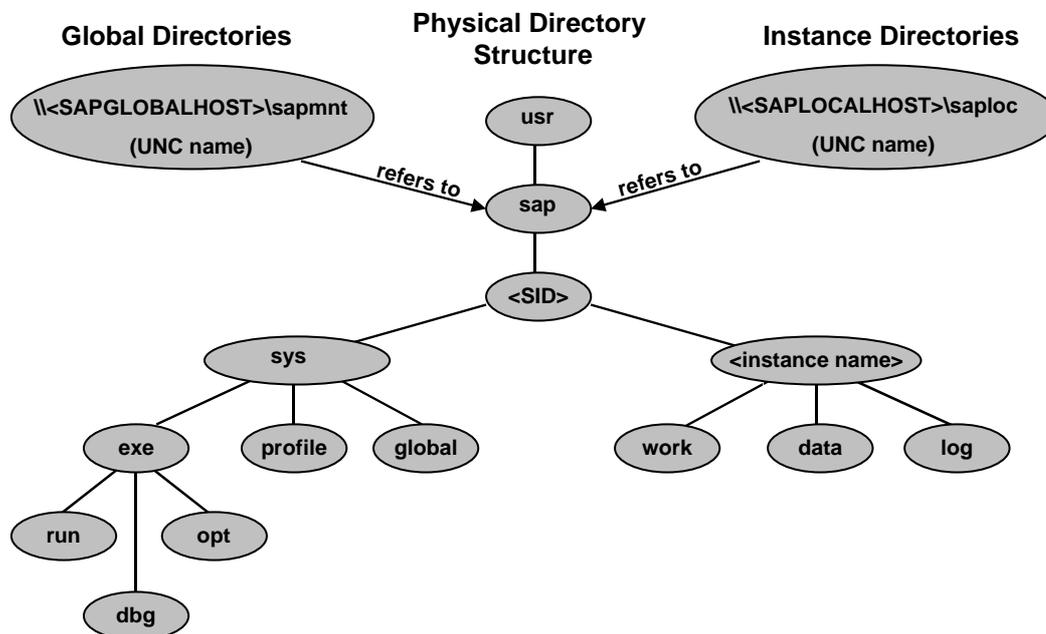
32/64-Bit Directory Structure on the Global (Central Instance) Host

The graphic shows the directory structure if you install your SAP system in mixed environments, for example you use a Windows and UNIX system, or you use a 32-bit and 64-bit Windows system.

Global Directories   **Physical Directory Structure**   **Instance Directories**

\\<SAPGLOBALHOST>\sapmnt (UNC name)   usr   \\<SAPLOCALHOST>\saploc (UNC name)

refers to   sap   refers to

<SID>

sys   <instance name>

exe   profile   global   work   data   log

<charset>   run   opt

<platform>   dbg

Key
<charset>: nuc for non-Unicode, uc for Unicode
<platform>: ntintel for 32-bit, ntia64 for 64-bit
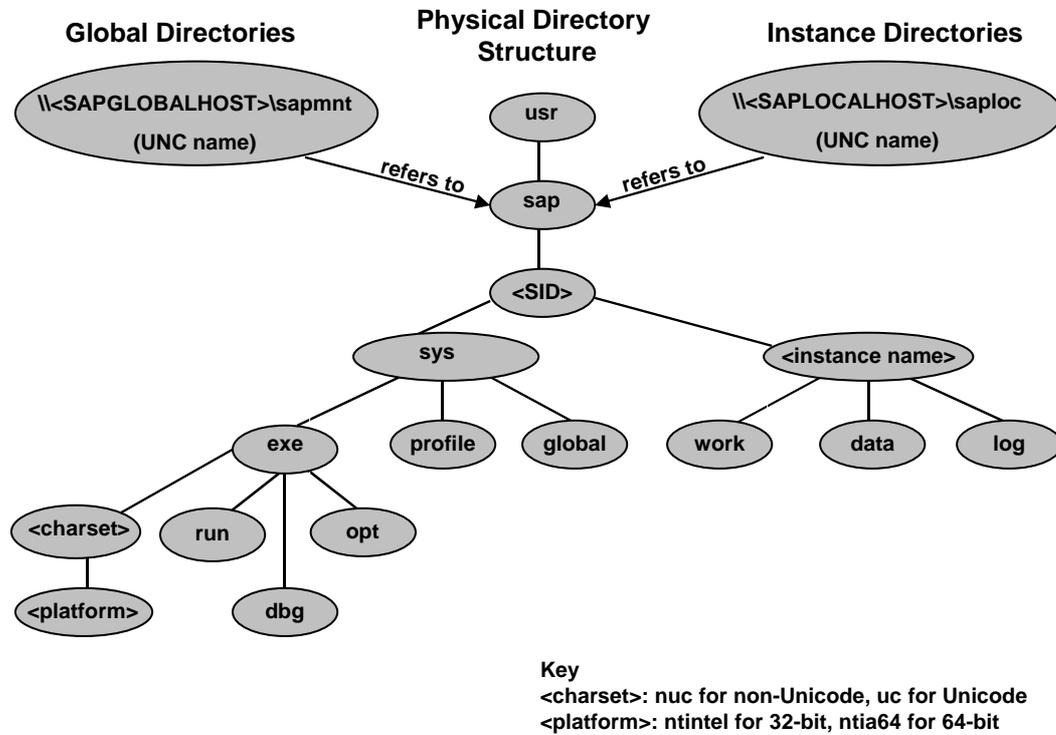
The above graphics show the directory structure on the global (central instance) host. The global data (binaries) is stored in the global directories on the global host and physically exists only once for each SAP system. Other application server access the data using the UNC name, `\\<SAPGLOBALHOST>\sapmnt`, where `SAPGLOBALHOST` is replaced by the SAP system with the name of the global host. The global host accesses its own instance-specific data using the UNC name `\\<SAPLOCALHOST>\saploc`. On the central instance host, the parameters `SAPGLOBALHOST` and `SAPLOCALHOST` have the **same** value.

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

Directory Structure of a Distributed Installation

The above graphic shows how the central instance, which runs on the global host, interacts with a distributed instance running on another computer. On a distributed instance host, the parameters `SAPGLOBALHOST` and `SAPLOCALHOST` have **different** values. Distributed instances use `SAPGLOBALHOST` to access global data on a separate host, that is, the global host with the central instance.

Central Instance	Distributed Instance

Access to global directories

usr

sap ← \\<SAPGLOBALHOST>\sapmnt (UNC name)

<SID>

sys

exe   profile   global

Access to local instance directories

usr

sap ← \\<SAPLOCALHOST>\saploc (UNC name)

<SID>

<instance name>

work   data   log   exe
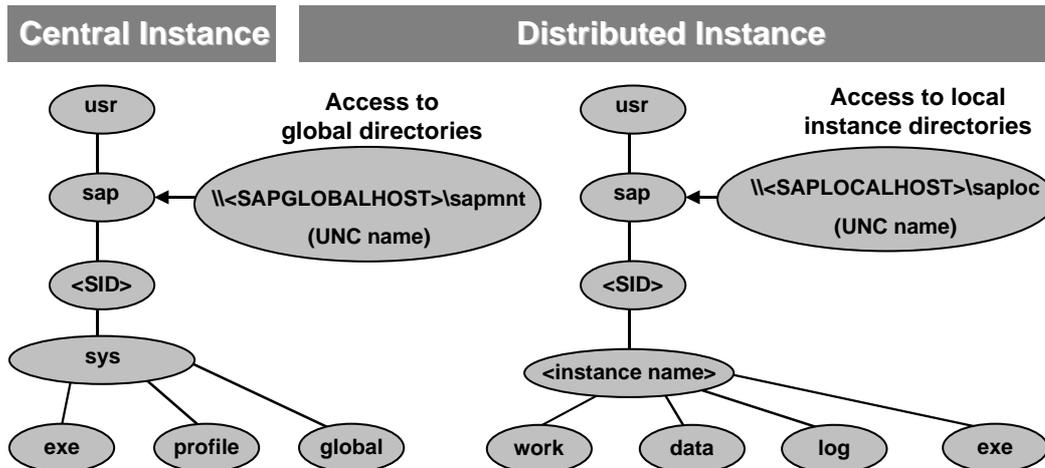
1.4.5 Hardware and Software Requirements

Purpose

You check the hardware and software requirements using the requirements checklists in the following sections. They give the **minimum** requirements for small SAP system installations and do **not** include customer data. Depending on the amount of data involved, the requirements might change. For a more precise sizing definition that reflects your particular system load:

- Use the *SAP Quick Sizer* tool available from SAP Service Marketplace

- You enter information on your planned system and the tool calculates the requirements.

  You can find more information on SAP Service Marketplace at
  `service.sap.com/sizing`

- Contact a hardware vendor. The vendor can analyze the load and calculate suitable hardware sizing for you.

- Contact the person in charge of installation or your Competence Center

Prerequisites

- Hardware certification

  You are only allowed to install an SAP system on certified hardware. AddOn Technology Center for SAP (AddOn TCS) certifies hardware platforms for SAP on Microsoft Windows. You can then run the SAP system on the respective platform for all the combinations of the SAP system and databases released by SAP for the specified release of MS Windows.

  You can find more information about certified platforms at `www.saponwin.com`

- For more information on the released operating systems, see **SAP Note 407328**.

- Use Windows 2000 Server or Windows Server 2003 as operating system.

1.4 Installation Planning

⚠

> With Windows, you must use the English (International) version of the operating system, but you can use a different language for the graphical user interface (GUI). For more information, see **SAP Note 362379**. You specify the operating system language when you install the operating system.

Process Flow

1. You see the requirements checklists of the SAP system instances you want to install:

    o   Central instance [Page 49]

    o   Database instance [Page 51]

    o   If you want to install SAP R/3 Enterprise ABAP+Java, also take into account the requirements of the central services instance listed in the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle*, section *Requirements Checklist for SAP Central Services Instance*.

    o   Dialog or gateway instance [Page 53], if you want to install additional dialog instances or a gateway instance.

    💡

    -   If you install multiple SAP system instances on one host, the requirements are cumulative.

        > For example, if you install a central system, you have to add the space and the RAM requirements of the central instance checklist and the database instance checklist.

    -   Be aware that Unicode SAP systems require additional hardware resources. You can find more information about Unicode SAP systems on SAP Service Marketplace at **service.sap.com/unicode**.

2. You check the network requirements. For more information, see the documentation *Network Integration of SAP Servers* on SAP Service Marketplace at **service.sap.com/network**

For more information on SAP software in PC networks, see **SAP Note 5324**.

⚠

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

1.4.5.1 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
	    o Central instance: 4 GB (not including virtual memory)
	    o 4.3 GB of temporary disk space for every required installation DVD you have to copy to a local hard disk (see Preparing the Installation CDs and DVDs [Page 66])
	
	To check disk space:
	  a. Choose *Start → Programs → Administrative Tools → Computer Management → Disk Management*
	  b. Select the local drive.
	  c. Choose *Properties.*
	
	• Minimum RAM:
	    o Central instance of an SAP R/3 Enterprise ABAP system:
	      • Non-Unicode SAP system: 512 MB
	      • Unicode SAP system : 1 GB
	    o Central instance of SAP R/3 Enterprise ABAP+Java:
	      • Non-Unicode SAP system: 768 MB
	      • Unicode SAP system: 1.2 GB
	    o J2EE Engine (if required): Between 64 MB and 4096 MB RAM are required, depending on the load of your SAP system
	
	⚠️ 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).
	
	To check RAM, in the Windows Explorer choose *Help → About Windows.*
	
	• Paging File Size (also known as virtual memory):
	    o 32-bit: 1 GB plus 3 times RAM. Maximum required is 10 GB.
	    o 64-bit: At least 20 GB is recommended for standard installations (for more information, see **SAP Note 153641**). If you want to install only a small system, contact your hardware partner for appropriate swap space values.

Requirement Type	Requirement

	To check paging file size:
	
	  a. Right-click *My Computer* and choose *Properties.*
	
	  b. Choose *Advanced → Performance Options.*
	
	  c. If required, in section *Virtual Memory*, choose *Change.*

Software	• Oracle 9.2.0 for Windows,
	
	• Current patch set, and hot fix if available.
	
	    For more information on the current patch set and hot fix, see **SAP Note 578683**.
	
	• English international version of one of the following:
	
	  o Windows Server 2003, Standard Edition
	
	  o Windows Server 2003, Enterprise Edition
	
	  o Windows Server 2003, Datacenter Edition
	
	  o Windows 2000 Server
	
	  o Windows 2000 Advanced Server
	
	  o Windows 2000 Datacenter Server
	
	    For any version of Windows 2000, you need at least service pack 4. For more information on the latest service pack supported by SAP, see **SAP Note 30478**.
	
	To check your Windows version:
	
	  a. Choose *Start → Programs → Accessories → Command Prompt.*
	
	  b. Enter the command `winver`
	
	• Make sure that the required fonts/code pages are installed.
	
	• Make sure that NLS and corresponding saplocales are installed.
	
	• Suitable Windows Resource Kit is strongly recommended

Other	• Make sure that the host name fulfills the requirements listed in **SAP Note 611361** (for example, the host name must not be longer than 13 characters). • If you want to install a printer on a decentralized host for the SAP system, make sure that the printer can be accessed under Windows. • Check that the network, dialog instance, and operating system requirements of are met.

1.4.5.2 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 (not including virtual memory): 　○ Oracle database software: 2 GB 　○ Database instance: 50 GB 　○ 4.3 GB of temporary disk space for <u>every required installation DVD [Page 64]</u> you have to copy to a local hard disk. To check disk space: a. Choose *Start → Programs → Administrative Tools → Computer Management → Storage → Disk Management* b. Select the local drive. c. Choose *Properties.* • Minimum RAM 　○ Non-Unicode SAP system: 512 MB 　○ Unicode SAP system: 1 GB 　○ J2EE Engine (if required): Between 64 MB and 4096 MB RAM are required, depending on the load of your SAP system ⚠️ 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). To check RAM, in the Windows Explorer choose *Help → About Windows.* • Paging File Size (also known as virtual memory) of 1.5 times RAM (recommended by Microsoft). To check paging file size: a. Right-click *My Computer* and choose *Properties.* b. Choose *Advanced → Performance Options.* c. If required, in section *Virtual Memory*, choose *Change.*
Software	• Oracle 9.2.0 • Current Oracle patch set and hot fix, if available. 💡 For more information on the current patch set, see

1.4   Installation Planning

Requirement Type	Requirement
	SAP Note 578683.
	• English international version of one of the following:
	○ Windows Server 2003, Standard Edition
	○ Windows Server 2003, Enterprise Edition
	○ Windows Server 2003, Datacenter Edition
	○ Windows 2000 Server
	○ Windows 2000 Advanced Server
	○ Windows 2000 Datacenter Server
	For any version of Windows 2000, you need at least service pack 4. For more information on the latest service pack supported by SAP, see **SAP Note 30478**.
	To check the Windows version:
	a. Choose *Start → Programs → Accessories → Command Prompt.*
	b. Enter the command `winver`
	• Make sure that the required fonts/code pages are installed.
	• Make sure that NLS and corresponding saplocales are installed.
	• Suitable Windows Resource Kit is strongly recommended
Other	• Make sure that the host name fulfills the requirements listed in **SAP Note 611361** (for example, the host name must not be longer than 13 characters).
	• If you want to install a printer on a decentralized host for the SAP system, make sure that the printer can be accessed under Windows.
	• Check that the network, dialog instance, and operating system requirements of are met.

1.4.5.3 🔲 Requirements Checklist for a Dialog or Gateway Instance

The dialog or gateway instance host must meet the following requirements:

Requirement Type	Requirement

Hardware	• Suitable backup system.
	
	• Minimum disk space
	
	    ○ Dialog instance: 4 GB (not including virtual memory)
	
	    ○ Gateway instance: 1 GB
	
	    ○ 4.3 GB of temporary disk space every required installation DVD [Page 66] you have to copy to a local hard disk.
	
	To check disk space:
	
	a. Choose *Start → Programs → Administrative Tools → Computer Management → Storage → Disk Management*
	
	b. Select the local drive.
	
	c. Choose *Properties*.
	
	• Minimum RAM
	
	    ○ Dialog or Gateway instance of an SAP R/3 Enterprise ABAP system:
	
	        • Non-Unicode SAP system: 512 MB
	
	        • Unicode SAP system : 1 GB
	
	    ○ Dialog or Gateway instance of SAP R/3 Enterprise ABAP+Java:
	
	        • Non-Unicode SAP system: 768 MB
	
	        • Unicode SAP system: 1 GB
	
	    ○ J2EE Engine (if required): Between 64 MB and 4096 MB, depending on the load of your SAP system.
	
	⚠️
	
	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).
	
	To check RAM, in the Windows Explorer choose *Help → About Windows.*
	
	• Paging file size (also known as virtual memory)
	
	• Paging File Size (also known as virtual memory):
	
	    ○ 32-bit: 1 GB plus 3 times RAM. Maximum required is 10 GB.

Requirement Type	Requirement
	o 64-bit: At least 20 GB is recommended for standard installations (for more information, 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: a. Right-click *My Computer* and choose *Properties.* b. Choose *Advanced → Performance Options*. c. If required, in section *Virtual Memory*, choose *Change*.

Software	• Dialog instance:
	Oracle 9.2.0 client software for Windows,
	
	• Current Oracle patch set and hot fix if available.
	
	For more information on the current patch set, see **SAP Note 578683**.
	
	• English international version of one of the following:
	   o Windows Server 2003, Standard Edition
	   o Windows Server 2003, Enterprise Edition
	   o Windows Server 2003, Datacenter Edition
	   o Windows 2000 Server
	   o Windows 2000 Advanced Server
	   o Windows 2000 Datacenter Server
	
	Note the following:
	
	For any version of Windows 2000, you need at least service pack 4. For more information on the latest service pack supported by SAP, see **SAP Note 30478**.
	
	To check the Windows version:
	
	a. Choose *Start → Programs → Accessories → Command Prompt*.
	
	b. Enter the command `winver`
	
	• Suitable Windows Resource Kit is strongly recommended.

Other	• Make sure that the host name fulfills the requirements listed in **SAP Note 611361** (for example, the host name must not be longer than 13 characters). • If you want to install a printer on a decentralized host for the e printers for the SAP system, make sure that the printer

Requirement Type	Requirement
	can be accessed under Windows.
	• Check that the network, dialog instance and operating system requirements are met.

1.5 ⛓ Installation Preparations

> Make sure that you read the <u>Installation Checklists [Page 22]</u> before you start the installation preparations.

1.5.1 ⛟ Checking for the Windows File System

Use

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.

> ⚠
>
> You **must** use NTFS for an SAP system installation.
>
> Do **not** install the SAP directories on an 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.

1.5.2 ⛟ Checking the Windows Domain Structure

Use

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.

⚠️

> 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 Domain Name System (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.

💡

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

1.5.3 🔽 Reducing the Size of the File Cache

Use

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

Procedure

1. Do one of the following:

   o **Windows Server 2003:**

     Choose *Start → Control Panel → Network Connections → Local Area Connections*.

   o **Windows 2000:**

     Choose *Start → Settings → Control Panel → Network and Dial-up Connections* and double-click *Local Area Connections*.

2. In the *Local Area Connection Status* dialog box, choose *Properties*.

3. In the *Local Area Connection Properties* dialog box, double-click *File and Printer Sharing for Microsoft Networks*.

   ⚠️

   > If you cannot select *File and Printer Sharing for Microsoft Networks*, this option has not yet been installed. To install it, you need the *Windows Server* CDs*.*

4. Select *Maximize data throughput for network applications*.

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

1.5.4 🔽 Granting User Rights for the Installation

Use

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

⚠️

> 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 the sections *Installation Planning* and *System Configuration*.

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

  ⚠️

  > 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.
  >
  > Never perform a local installation on a domain controller.

Procedure

Local Installation

1. Check that you have `Local Administration` 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 Admins` group.

Domain Installation

1. Check that you have `Domain Administration` 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 Admins` group.

   💡

   > If you are **not** granted domain administration rights, you can perform the installation as a domain user who is a member of the local administrator 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 58].

1.5.4.1 Performing a Domain Installation Without Being a Domain Administrator

Use

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

> You normally perform a domain installation of the SAP system as a user with domain administration rights, as described in Granting User Rights for the Installation [Page 57].

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.

Procedure

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

    > 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**

> 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:

> 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>
User logon name (before Windows 2000):	<sapsid>adm	SAPService<SAPSID>

3. Choose *Next* and enter the following:

    Password: `<password>`

    Confirm password: `<password>`

4. Select *Password never expires*

> 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 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.

> 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*.

> The `SAPService<SAPSID>` user must **not** be a member of the domain users group.
>
> To remove this group from the *Member of* list:

   i.   Select the SAP_<SAPSID>_GlobalAdmin group.

   ii. Choose Set Primary Group.

   iii. Select the domain users group.

   iv. 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.*

1.5.5 Choosing the SAP System IDs

Use

You need to choose an SAP system ID that identifies the whole system. This ID has to be entered for the variable <SAPSID> when you install the central instance.

> - You **cannot** change the SAP system ID after the installation.
> - If you want to install a **standalone gateway** you must choose a SAP System ID that is different from the SAP System ID of the central instance.

Procedure

Make sure that you system IDs:

- Are unique throughout your organization
- Consist of exactly three alphanumeric characters

- Contain only uppercase letters

- Have a letter for the first character

- Do 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`

  ⚠️

  Choose your SAP system ID carefully. Renaming is complicated and requires you to re-install the SAP system.

  ⚠️

  If you intend to install a dialog instance on the database host, make sure that the DBSID is different from the dialog name, otherwise the installation will not continue.

  The dialog instance name is made up as follows: letter **D** (system setting) and **instance number** (user setting), for example `D01`.

1.5.6 Preparing the SAP System Transport Host

Use

You need to prepare one transport host in the SAP system. This host has the function of controlling the import or export of files between the current SAP system and other SAP systems (for example, a test or development system).

The transport host uses the `usr\sap\trans` directory to temporarily store files that have been exported from one system and are waiting to be imported into another system. Depending on your requirements, you can decide to use the central instance host, the dialog instance host, or any other host as the transport host.

💡

For more information on preparing the SAP system transport host, see **SAP Note 360515**.

Procedure

1. Map the IP address of the transport host to the alias `SAPTRANSHOST`, using one of the following methods:

   o On the DNS server

     If a DNS server is available for your system, ask your administrator to map the IP address of the transport host to the alias `SAPTRANSHOST`.

     The DNS server is a database that contains a set of files with information about the TCP/IP network, including the mapping of host names or aliases to IP addresses.

   o In the `hosts` files

     If no DNS server is available, you can map the IP address to the alias `SAPTRANSHOST` in the `hosts` file, which you can find in the Windows default directory:

```
<Drive>:\%windir%\system32\drivers\etc
```

Perform the mapping as follows:

    i.   Open the `hosts` file with an editor.

    ii.   Add the following line:

```
<IP_address> <hostname> SAPTRANSHOST
```

        This step assigns the alias `SAPTRANSHOST` to the transport host.

    iii.   Copy the newly edited `hosts` file to all hosts where an SAP instance is to run.

If the transport host has more than one network card, take special care when you determine the IP address that is entered in the `hosts` file or on the DNS server:

- Make sure that you enter the main IP address and that the binding order is correctly defined.

- To check the binding order, choose:

  Start → Settings → Network and Dial-up Connections → Advanced → Advanced Settings

2. If your transport host is **not** the central instance host, you have to create the transport directory as follows:

   a. On the transport host, create the directory `\usr\sap\trans`.

   b. Grant *Everyone* the permission *Full Control* for the directory.

   These permissions are only necessary during the SAPinst installation.

   After the installation, you only need grant *Full Control* on the directory to the `SAP_<SID>_GlobalAdmin` groups of all the systems that are part of your transport infrastructure. SAPinst assigns the appropriate rights with the help of an additional `SAP_LocalAdmin` group.

   For more information, see [Automatic Creation of Accounts and Groups [Page 126]](#).

   c. If no SAP instance is to be installed on the transport host, share the `usr\sap` directory on the transport host as `SAPMNT`.

   This enables SAPinst to address the transport directory in the standard way as `\\SAPTRANSHOST\SAPMNT\trans`.

Result

You have configured your system so that the installation tool SAPinst can recognize the transport host.

1.5.7 Preparing the System for SAPinst

Use

You use this procedure to prepare your installation host for SAPinst.

The installation tool SAPinst uses the Java-based graphical user interface SAPinst GUI.

> If required, you can perform a **remote** installation using a standalone SAPinst GUI on a separate Windows or UNIX host. This enables you to perform the installation on a remote host while monitoring it with the SAPinst GUI from a local host. If you want to perform a remote installation, see <u>Remote Installation with SAPinst [Page</u> 114<u>]</u>. In this case, prepare both the local and the remote host for SAPinst.

To prepare the system for SAPinst and SAPinst GUI you need to do the following:

- Check your Java Runtime Environment (JRE) on the host where SAPinst GUI runs, because the JRE cannot be integrated into the SAPinst GUI executable for all platforms due to licensing issues.

- Set the DISPLAY environment variable if you are installing on UNIX.

Procedure

1. Check that a released Java Runtime Environment (JRE) exists on the host where the SAPinst GUI is to run:

Platform	Required JRE for the SAPinst GUI
Windows 64 bit (ia64), Linux (ia64), Linux for zSeries (s390x), **z/OS (OS390 resp. z/OS)**	The required JRE version is the same as for SAP Web AS 6.40. For the actual required JRE version see SAP Service Marketplace at **service.sap.com/platforms** → *Product Availability Matrix* → *SAP NetWeaver* → *SAP NetWeaver 04* → *JSE Platforms* • JRE is **not** part of the SAP shipment. If necessary, you need to download and install it. • To check the version of an already installed JRE, enter: **java –version** • If you have more than one Java Virtual Machine (JVM) installed on your system (for example, you have two JREs with different versions installed), make sure that the SAPINST_JRE_HOME environment variable (on UNIX: for user root) is set to the valid <JAVA_HOME> directory. **UNIX only:** You must include the path to a valid <JAVA_HOME>/bin directory in the path for user root or set the SAPINST_JRE_HOME environment variable for the user root to the valid <JAVA_HOME> directory as follows: | Shell Used	Command | |---|---| | Bourne shell | SAPINST_JRE_HOME=<path_to_JAVA_HOME> |

	(sh)	`export SAPINST_JRE_HOME`
	C shell (csh)	`setenv SAPINST_JRE_HOME <path_to_ JAVA_HOME>`
	Korn shell (ksh)	`export SAPINST_JRE_HOME=<path_to_ JAVA_HOME>`

Windows 32 bit (x86), **HP-UX (PA-Risc),** **HP-UX (ia64),** **Solaris (sun4u)**	No special JRE is required for the SAPinst GUI, because the JRE is integrated in the SAPinst GUI executable. As the JRE is temporary extracted on your host, you need at least about 40 – 80 MB of free disk space for that purpose. After the installation, SAPinst removes this JRE from your host automatically.
Other platforms	The required JRE is 1.3.0 or higher. • JRE is not part of the SAP shipment. If necessary you need to download and install it. • To check the version of an already installed JRE, enter: java – version • If you have more than one Java Virtual Machine (JVM) installed on your system (for example, you have two JREs with different versions installed), make sure that the `SAPINST_JRE_HOME` environment variable (on UNIX: for user `root`) is set to the valid `<JAVA_HOME>` directory. **UNIX only:** You must include the path to a valid `<JAVA_HOME>/bin` directory in the path for user `root` or set the `SAPINST_JRE_HOME` environment variable for the user `root` to the valid `<JAVA_HOME>` directory as follows:

Shell Used	Command

Bourne shell (sh)	`SAPINST_JRE_HOME=<path_to_JAVA_HOME>`
	
	`export SAPINST_JRE_HOME`

C shell (csh)	`setenv SAPINST_JRE_HOME <path_to_ JAVA_HOME>`
Korn shell (ksh)	`export SAPINST_JRE_HOME=<path_to_ JAVA_HOME>`

2. **UNIX only:**
   Make sure that your DISPLAY environment variable is set to **<host_name>:0.0**, where `<host_name>` is the host on which the SAPinst GUI is to be displayed.

3.

Shell Used	Command
Bourne shell (`sh`)	`DISPLAY=<host_name>:0.0` `export DISPLAY`
C shell (`csh`)	`setenv DISPLAY <host_name>:0.0`
Korn shell (`ksh`)	`export DISPLAY=<host_name>:0.0`

1.5.8 ⬇ Preparing the Installation CDs and DVDs

Use

You use this procedure to prepare the installation CDs and DVDs.

Procedure

1. Using *Media Information for SAP R/3 Enterprise*, identify the required CDs and DVDs for your installation and keep them separate from the remaining CDs and DVDs. This avoids mistakes between CDs and DVDs with similar names, so that you use the correct CDs and DVDs for your installation.

   ⚠️

   The CD and DVD names in the table below are **abbreviated**.

   You can find the **full names** in *Media Information for mySAP R/3 Enterprise* on SAP Service Marketplace at: `service.sap.com/instguides` → *SAP Components* → *SAP R/3 Enterprise* → *SAP R/3 Enterprise Core 4.70 / Ext. Set 2.00 (SR1)*

   The following table shows the required CDs and DVDs:

SAP Instance Installation	Required CDs or DVDs
Central instance	*SAP Installation Master DVD*
	SAP Kernel CD
	SAP Web AS Java DVD (includes CD IGS folder IGS_SOFT for the installation of IGS)
	Database DVD
Database instance for a **non-MCOD** installation	*SAP Installation Master DVD*
	SAP Kernel CD
	All *Export CDs*
	Database DVD
Database instance for an **MCOD** installation	*SAP Installation Master DVD*
	SAP Kernel CD
	All *Export CDs*

Dialog instance	*SAP Installation Master DVD*
	SAP Kernel CD
	SAP Web AS Java DVD (includes CD IGS folder IGS_SOFT for the installation of IGS)
	Database DVD
Gateway instance	*SAP Presentation DVD*

> For the installation of a Unicode SAP system, the Unicode *SAP Kernel CD* is required. For the installation of a non-Unicode SAP system, the non-Unicode *SAP Kernel CD* is required.

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

2. Use one of the following methods to make CDs and DVDs available in parallel:

    o   Before the installation:

        ▪   Have sufficient CD and DVD drives

        ▪   Copy CDs and DVDs manually to local hard disks

> Do not use network drives for your CDs and DVDs.

    o   During the installation:

        Use the SAPinst , that is, you can check the entered location and then copy the entire CD or DVD to the path you entered in column *Copy Package to*.

1.5.8.1 Using the CD Browser Dialog

Use

During the installation procedure SAPinst **first checks** and **finally verifies** the availability and location of the required installation CDs and DVDs. SAPinst does this by displaying a *CD Browser* dialog, which prompts you for the file LABEL.ASC, which contains information about the software package to be installed.

> To find the correct location of the file LABEL.ASC, look in the file README.TXT if available, located in the root directory of the relevant CD and DVD.

Procedure

SAPinst displays the *CD Browser* dialog in the following situations:

*   SAPinst wants to check the availability of the software package in advance.

    In this case, you see *Check Location* displayed in the *CD Browser* window.

    Choose one of the following actions:

Situation	Action	Result

1.5.7 Preparing the System for SAPinst

Situation	Action	Result
You are not yet sure where to set up the software package.	Do not enter any *Package Location* and do not select *Check Location*.	SAPinst skips the check and you can continue the installation procedure. However, SAPinst asks later for the missing LABEL.ASC (see final bullet point below).
You know where the software package will be but have not yet set it up.	Enter the path in *Package Location* but do not select *Check Location*.	SAPinst skips checking the label location, but your entered package locations are used later for the installation. SAPinst only asks again for a missing LABEL.ASC if the package location is incorrect (see final bullet point below).
You have already set up the software package at a specific location.	Enter the path in *Package Location* and select *Check Location.*	SAPinst checks the label location and displays an error message if the location is incorrect. If all locations are correct, SAPinst does not ask again for the LABEL.ASC files.

- SAPinst cannot find the correct LABEL.ASC but needs the location of the software to process the installation now.

  You can recognize this situation because *Check Location* in the *CD Browser* window is empty. You must now enter the path to the correct LABEL.ASC. Otherwise, the installation cannot continue.

  > When SAPinst prompts for a folder `<FOLDER_NAME>` on a CD or DVD, make sure that you enter the path to the corresponding directory on this DVD (`<CD_or_DVD>\<FOLDER_NAME>`).

  In addition, you can copy the installation package by entering a location in the column *Copy Package to*.

1.5.9 Preparing the Active Directory

Use

If you decided to use <u>LDAP directory services [Page 39]</u>, 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 the R3SETUP tool 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

For more information on how to set up a *Netscape* / *iPlanet* directory server, see the documentation *R/3 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 must be installed on the network.

- You must have an *SAP Kernel CD* of an SAP system installation that is based on SAP Web Application 6.10, SAP Basis 4.6D, or lower and contains the previous installation tool R3SETUP.

If you do not have an *SAP Kernel CD* with R3SETUP, you can download one from SAP Service Marketplace at **service.sap.com/installations** → *SAP Installations and Upgrades* → *Entry by Application Group* → *SAP NetWeaver Components* → *SAP NetWeaver Components (< SAP NW 04)* → *SAP Web AS* → *SAP Web AS 6.10* → *NT/I386* → *<your_database>.*

Procedure

Installing the R3SETUP Tool

You use this procedure to install the R3SETUP tool on the domain controller where the Active Directory is located.

1. Log on to the domain controller as domain administrator.

2. Check that the TEMP environment variable has been set:

   a. Right-click *My Computer* on the Windows desktop

   b. Choose *Properties* → *Advanced* → *Environment Variables.*

   TEMP is normally set to:

   `%userprofile%\Local Settings\Temp`

   For more information, see **SAP Note 387745**.

3. Insert the SAP Kernel CD.

4. Start the program R3SETUP.BAT from the directory

   `<CD_DRIVE>:\NT\COMMON`

   The R3SETUP window opens.

5. Enter the following when R3SETUP prompts you:

   o The name of your SAP system <SAPSID>

   o The directory on your hard disk that the R3SETUP files are to be copied to. The default directory is <DRIVE>:\USERS\<SAPSID>ADM\INSTALL

   When you have made all the required entries, the R3SETUP tool is automatically installed.

6. Choose *Yes* when a dialog box appears prompting you to log off or reboot.

   The R3SETUP tool now automatically logs off or reboots.

Configuring the Active Directory

1. Log on as the same user that installed the R3SETUP tool.

2. Choose Start → Programs → SAP system Setup for <SAPSID> → Configure Active Directory for SAP.

3. When you are prompted:

    o   Confirm the name of the domain where the `SAP_LDAP` group is to be created. This is the domain that you are logged on to.

    o   Enter the password of the `sapldap` user.

    When you have made these entries, the R3SETUP tool automatically configures the Active Directory.

1.6 Installation Process

Make sure that you read the Installation Checklists [Page 22] before you start the installation.

1.6.1 Installing the Oracle Database Software

Use

You install the Oracle 9.2.0 database software.

- For a 32-bit system there are three RDBMS CDs. They are located on the RDBMS DVD for 32-bit in the directories `ORA92_1` to `ORA92_3`.

- For a 64-bit system there are two RDBMS CDs. They are located on the RDBMS DVD for 64-bit in the directories `ORA92_1` to `ORA92_2`.

> During the installation, you are prompted to specify the correct path to CD2 and CD3, if applicable. To avoid this, you can copy the CDs to disk as follows **before** the installation:
>
> a. Copy the contents of `ORA92_1\NT\<platform>` on the `RDBMS DVD` to **`\disk1`** on your hard disk.
>
> b. Repeat this for the second CD.
>
> c. For a 32-bit system, also repeat this for the third CD.
>
> `\disk1` to `\disk3` can be on a network drive if required.

> You must run different files to install the client and the server software.

> **MSCS only:**
> Install the Oracle 9.2.0 software on both nodes.

Procedure

1. Start the *Oracle Universal Installer* as follows:

   o Place the Oracle RDBMS DVD for 32-bit or 64-bit in the DVD drive and start from `<DVD_DRIVE>:\ORA92_1\NT\<platform>`

   o If you have copied the CDs to disk, start from `\disk1`

   On the **database server**, double-click the file `sapserver.cmd`

   On the **database client** double-click the file `sapclient.cmd`

2. Enter the information as shown in the following table.

Window	Entry

Window	Entry
File Locations	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, C11920
	For *Path* Enter the path of a **new** Oracle Home directory. We recommend that you use the path:
	`<DRIVE>:\ORACLE\<DBSID>\<ORA_VERS>`, for example,
	`C:\ORACLE\C11\920`
	![light bulb icon]
	Do not specify an already existing Oracle Home directory. You must specify a new directory.
	You need **2.2 GB** disk space for the Oracle 9.2.0 server software and about **250 MB** for the Oracle 9.2.0 client software
	Choose Next.
Oracle Server Software only: *Create Database*	Choose No and then Next.
Summary	Choose Install.
Oracle Server Software only: *Oracle Net Configuration Assistant: Welcome*	If this dialog appears, select *Perform typical configuration*.
File Locations / End of Installation	Choose Exit.

3. Install the latest patch set and hot fix (if available) as described in **SAP Note 578683** and the `patch_note.htm` file on the patch CD.

![light bulb icon]

MSCS only:

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

1.6.2 Running SAPinst

Use

This procedure tells you how to run SAPinst to install one or more SAP instances.

It describes an installation where SAPinst GUI and SAPinst server are running on the same host. If you want to perform a remote installation (SAPinst GUI is running on another host), see Remote Installation with SAPinst [Page 114].

SAPinst normally creates the installation directory `sapinst_instdir` directly below the `Program Files` directory.

> Each SAP instance requires a separate installation directory.

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

> In the temporary directory you can also find the SAPinst Self-Extractor log file `dev_selfex.out`, which might be useful if an error occurs.

If you want to terminate SAPinst and the SAPinst Self-Extractor, do one of the following:

- 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 → Exit*.

Prerequisites

- You need at least 50 MB of free space in the installation directory for **each ABAP installation service**. In addition, you need 60-200 MB free space for the SAPinst executables. If you are not able to provide 200 MB free space in the temporary directory, you can set one of the environment variables TEMP, TMP or TMPDIR to another directory with 200 MB free space for the SAPinst executables.

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

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

- 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 36].

SAPinst GUI Handling

The following push buttons are available on the different SAPinst GUI dialogs (input screens, installation progress screen, message boxes):

SAP

Push Button	Meaning
Back	Displays the previous dialog for editing.
Next	Displays the next dialog for editing.

Cancel	Cancels the installation with the following options:
	
	− *Stop*
	    Stops the installation without further changing the installation files. You can continue the installation later from this point.
	
	− *Reset*
	    Resets all installation input files. All files in the installation directory are removed from the system and no log files are saved. You must restart the installation from the beginning.

Log Off	Cancels the connection to the SAPinst GUI only. The SAPinst server keeps on running. Typical use case: You need to log off during the installation (for what reason ever) from the host where you control the installation with SAPinst GUI. Then you can connect from another host to the running installation. Be aware that you need the *SAP Installation Master DVD* for that. For more information on running SAPinst GUI standalone, see Starting SAPinst GUI on the Local Host [Page 115].
View Log	Displays the content of the `sapinst.log` file during the installation.
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.
Reset	Resets all installation input files. All files in the installation directory are removed from the system and no log files are saved. You must restart the installation from the beginning.
Continue	Continues with the option you have chosen before. If a message box comes up and you choose *Cancel*, SAPinst then offers you the options *Continue, Stop, Reset*. Do **not** choose *Continue*, but choose *Stop* or *Reset*. If you choose *Continue* an error occurs.

Procedure

1. Log on to your host as a user who is a member of the local administration group.

2. Insert the *SAP Installation Master DVD* in your DVD drive or mount it locally.

> If you want to install a gateway instance you have to use the *SAP Presentation DVD.* In this case, replace `<SAP Installation Master DVD>` with `<SAP Presentation DVD>` in this section.

3.   Start SAPinst from the *SAP Installation Master DVD* in one of the following ways:

   o   Using the **default** installation directory

   Double-click `sapinst.exe` from the following path:

   `<DVD drive>:\IM<x>\SAPINST\NT\<platform>`

   > To find the SAPinst executable in your platform-specific `IM<x>` directory, look in the **`README.TXT`** file on the SAP Installation Master DVD.

   > On Windows 64-bit, the path to SAPinst is as follows:
   >
   > **`<SAP_Installation_Master_DVD>\IM1\SAPINST\NT\IA64`**
   >
   > SAPinst creates an installation directory where it keeps its log files. By default the installation directory is located below `%ProgramFiles%\sapinst_instdir`. The exact name of the subdirectory depends on the installation service chosen by you.

   o   Using an **alternative** installation directory

   If you want SAPinst to use a directory other than the default, you can create a new one manually:

   i.   Open a command prompt and enter: **`mkdir <SAPinst_INSTDIR>`**.

   ii. Change to the installation directory: **`cd <SAPinst_INSTDIR>`**.

   iii. Enter
        `<SAP_Installation_Master_DVD>\IM<x>\SAPINST\NT\<platform>\`

   SAPinst uses your installation directory as the current working directory for the installation. It does **not** create an installation directory called `sapinst_instdir`.

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.

> SAPinst uses the ports 21212 and 21213 during the installation for communication with SAPinst GUI. You get an error message if one of these ports is already used by another service. In this case, open a command prompt and change to `<DVD drive>:\IM<x>\SAPINST\NT\<platform>`. Run: **`.\sapinst.exe SAPINST_DIALOG_PORT=<free_port_number>`**. For example, if you enter `60000` as `<free_port_number>`, SAPinst uses the ports `60000` and `60001`.

4.   In the *Welcome* screen, select the corresponding installation service from the tree structure as listed in the table below and choose *Next*.

Installation Procedure	Installation Tasks in SAPinst
Installing a central instance	*SAP R3E 4.7x200 SR1* → *ABAP System* → *<Unicode or non-Unicode>* → *Install a Central Instance*
Installing a database instance	*SAP R3E 4.7x200 SR1* → *ABAP System* → *<Unicode or non-Unicode>* → *Install a Database Instance*
Installing a dialog instance	*SAP R3E 4.7x200 SR1* → *ABAP System* → *<Unicode or non-Unicode>* → *Install a Dialog Instance*
Installing a gateway instance	*Install SAP Gateway*

SAPinst creates a subdirectory for the chosen installation service below the current working directory. If you started SAPinst using the default installation directory, the directory structure is:

```
<sapinst_instdir>\<installation_service>
```

5. If SAPinst prompts you to log off from your system, log off and log on again.

SAPinst restarts automatically.

6. Follow the instructions in the SAPinst dialogs.

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* is displayed.

Troubleshooting

- If an error occurs during the **dialog phase**, SAPinst:
    - Stops the installation
    - Displays a dialog informing you about the error

  You can now directly view the log file by choosing *View Logs*

  You must abort the installation with *Stop* or *Reset,* and try to solve the problem.

- If an error occurs during the **processing phase**, SAPinst:
    - Stops the installation
    - Displays a dialog informing you about the error

  You can now:
    - Directly view the log file by choosing *View Logs*
    - Try to solve the problem
    - Continue the installation by choosing *Retry.*
    - *Stop* or *Reset* the installation

For more information, see .

1.6.3 Input for the Installation

The following table lists prompts that are required for the installation of the central, database, dialog and gateway instance.

> The table does not necessarily reflect the actual order in which the input windows appear during the installation.

Throughout this section, the following abbreviations are used:

- CI: Central instance

- DB: Database instance

- DI: Dialog instance

- GW: Gateway instance

> If you install a gateway instance, *SAP Gateway* may appear in some of the screens nstead of *ABAP*. For example *SAP Gateway > Definining the LDAP Parameters*.

Window	Prompt	Action
SAPinst CD Browser > Checking Software Packages	*CD Name* *Package Location* *Check Location* *Copy Package To* **CI/DB/DI/GW**	This dialog only appears if the system wants to check or cannot find the file LABEL.ASC that contains the relevant installation information. For more information on the CD Browser dialog, see <u>Preparing the installation CDs and DVDs [Page 66]</u>. • CI, DI, DB, GW: Under *Package Location*, enter the path to the directory where the file LABEL.ASC is located. • To find the correct location of the installation package, look in the file README.TXT located in the root directory of the relevant CD or DVD. • When SAPinst prompts for a folder <FOLDER_NAME> on a DVD, make

1.6 Installation Process

Window	Prompt	Action
		sure that you enter the path to the corresponding directory on this DVD (`<CD_or_DVD>\< FOLDER_NAME>`). ⚠️ DB only: If SAPinst prompts for a CD or DVD that is not required for your operating system or database, do not enter a *Package Location* and deselect the flag *Check Location* for this CD or DVD (see Preparing the installation CDs and DVDs [Page 66].
ABAP System > Specifying Logon Data for RFC Connection	*Password* **DI/DB**	This prompt only appears if: • The DDIC password is not set to its default value during the installation (for example, as you logged on to the SAP system during the installation and the SAP system prompted automatically for a new password). In this case, enter the changed password of user DDIC. • The SAP system is not running or can not be accessed on the network. In this case, eliminate the cause (for example, start your SAP system), enter the default DDIC password and continue the installation.
Welcome	*Select the service to install* **CI/DB/DI/GW**	Choose *SAP R3E 4.7x200 SR1 → ABAP System → <Unicode or non-Unicode>* and choose the installation service you want to install: ⚠️ When you install the SAP system for the first time, you first have to install the central instance before you install the database instance. • CI: *Install a Central Instance* • DB: *Install a Database Instance* • DI: *Install a Dialog Instance* • GW: *Install SAP Gateway*

Window	Prompt	Action
ABAP System > Selecting the SAP System ID	*SAP System Identification:* *SAP System ID (SAPSID)* **DB**	Enter exactly the name of the SAP system `<SAPSID>` that you have entered during the central instance installation.

Window	Prompt	Action

ABAP System > Selecting the Database Instance Installation Method	*Database Installation Method*
	
	DB
		• If you want to install a new SAP system, choose *Standard Installation*
		
		• If you want to copy or migrate an existing SAP system, choose one of the following methods. For more information on each method, see the documentation *Homogeneous and Heterogeneous System Copy for SAP Systems Based on SAP Web Application Server 6.40.*
		
		  o If you want to copy or migrate an existing SAP system with the R3load method, choose *System Copy / Migration (R3load)*.
		
		  o If you want to reinstall the target database while keeping the SAP settings, choose *System Copy / Migration by Reload: Refresh the database content (R3load).* With this option, data stored in the target database will be deleted. Then, data from the source database will be reloaded. The reload service is not available for MCOD systems!
		
		  o If you want to install the target system with the Migration Monitor to run export and import in parallel, choose *System Copy / Migration using Migration Monitors (R3load).* This option requires the installation of Java SDK 1.4 on both source and target database host.
		
		  o If you want use a homogeneous system copy to generate a database instance System choose *System Copy/Oracle Backup/Restore.* With this option, *y*ou generate users and groups and the environment, if necessary.
		SAPinst stops the installation and asks you to generate the database manually via database copy or backup restore. When you have finished, SAPinst performs some post-installations steps, for example, initializing the work bench, generating temporary license keys, consistency checks.

Window	Prompt	Action
ABAP System > Deciding Usage of Existing Database	*Usage of Existing Database* **DB**	• To install a system into an existing database (**MCOD**), select *Yes, existing Database (additional SAP system)*. • In all other cases, select *No, new Database (first SAP system)*.
ABAP System > Specifying the Dialog Instance Common Parameters	*SAP System Instance Identification:* *SAP System ID* **DI**	Enter exactly the name of the SAP system `<SAPSID>` that you have entered during the central instance installation.
	Instance number **DI**	Enter a number of the dialog instance. You can assign a value from 0 to 97, but **not** the numbers 2, 25, 43, 60, 72, or 89. If more than one SAP instance is running on the same host, these instances must be assigned different numbers.
	Instance Host **DI**	Enter exactly the central instance number that you have entered during the central instance installation. To find out the instance number, look under the SAP directory `usr\sap\<SAPSID>\DVEBMGS<nn>`. The value `<nn>` is the number assigned to the central instance.
ABAP System > Specifying the Central Instance Common Parameters	*SAP System Instance Indentification:* *SAP System ID (SAPSID)* **CI/DB/DI/GW**	• CI: Enter the SAP system `<SAPSID>` ID, for example, C11. For more information, see Choosing the SAP System IDs [Page 61]. • DB/DI: Enter exactly the name of the SAP system `<SAPSID>` that you have entered during the central instance installation.
	SAP System Instance Indentification: *Instance Number* **CI/DB/DI**	• CI: Enter the number of the central instance. You can assign a value from 0 to 97, but **not** the numbers 2, 25, 43, 72, or 89. • DB/DI: Enter exactly the central instance number that you have entered during the central instance installation. To find out the instance number, look under the SAP directory `usr\sap\<SAPSID>\DVEBMGS<nn>`. The value `<nn>` is the number assigned to the central instance.

1.6 Installation Process

Window	Prompt	Action
	SAP System Instance Indentification: Instance Host **CI/DB/GW**	• CI: Enter the name of the central instance host. • DB/DI: Enter exactly the name of the central instance host that you have entered during the central instance host. To find out the host name, enter `hostname` at the command prompt of the central instance host. • GW: Enter the name of the gateway instance host.
ABAP System > Specifying the Database Instance Common Parameters	*Database Parameters:* *Database ID (DBSID)* **CI/DB/DI**	• CI: Enter the name of the database instance `<DBSID>`. ⚠️ If you install a system into an existing database (**MCOD**), enter exactly the name of the existing database. • DB, DI: Enter exactly the name of the database instance `<DBSID>` that you have entered during the central instance installation.
	Database Parameters: *Database Host* **CI/DB/DI**	• CI, DB: Enter the name of the database host. To find out the host name, enter **hostname** at the command prompt of the database host. 💡 If you install a central system (that is, you want to install the central instance and the database instance on one host), enter the name of the central instance host. • DI: Enter exactly the name of the database instance host that you have entered during the central instance installation.

Window	Prompt	Action
ABAP System > Specifying the SAP Instance Host Parameters	*Instance Memory Management:* *Instance RAM (MB)* **CI/DB/DI/GW**	Enter RAM space that is reserved for the SAP instance. The default value is the entire RAM space. Be sure to reserve at least the minimum values required for your instance.
	Domain Information for the SAP System Accounts **CI/DB/DI**	Choose one of the following: • Local installation • Installation in the domain of the current user • Installation in a different domain
SAP Gateway > Specifiying the Gateway Instance Parameters	*Gateway Parameters:* *SAP System ID* **GW**	Enter the SAP system `<SAPSID>`, for example, G11. For more information, see [Choosing the SAP System IDs](#).
	Gateway Parameters: *Instance number* **GW**	Enter the number of the gateway instance. You can assign a value from 0 to 97, but **not** the numbers 2, 25, 43, 60, 72, or 89.

Window	Prompt	Action
ABAP System > *Defining the LDAP Parameters*	*LDAP Support* **CI/DI/GW**	If you want to use LDAP for SAP Logon or the Microsoft Management Console (MMC), choose the type of LDAP integration you want to configure for the SAP system. Otherwise, choose *No LDAP*: • *Via Active Directory Service* Select this option to integrate Windows Active Directory services. An Active Directory must be available on the network. (Profile parameter `ldap/options=DirType=NT5ADS)` • *Via Generic LDAP Directory* Select this option to configure the system to support LDAP directories that are running on Windows or UNIX machines. A generic LDAP directory must be available on the network. • *No LDAP* Select this option if you do not want to use LDAP for SAP Logon and/or MMC or if you do not want to use LDAP at all. Required Input Depending on your selection the information below is required. If you choose *No LDAP*, none of the LDAP parameters listed below has to be specified.
	Management Domain	Specifies a container in the Active Directory where information related to the new SAP system is to be stored. Use the distinguished name syntax. The name of the container (management domain) can reflect the organizational structure of your company. For example, if the system is for corporate finance and located in Walldorf, the name can be: `CN=Finance, CN=Walldorf`. Profile parameter: `ldap/saprdn` You need not specify this. However in a large system landscape, we recommend setting this parameter to reflect the structure of multiple SAP installations.

Window	Prompt	Action
	LDAP Server	Enter the DNS host name of the server on which the LDAP directory is running. If the directory is replicated on other servers in the network, specify these as well. For example: `ldapsrv1 ldapsrv2`. Profile parameter: `ldap/servers`. Note that the replica must be writeable. • *Via Active Directory Service:* We do not recommend setting this parameter. If you do not set this parameter, the system automatically finds the best ADS Server. • *Via Generic LDAP Directory* You must specify one or more LDAP servers, separated by blanks.
	Container for all SAP related entries	Specifies the SAP root container in the LDAP directory under which all future information related to SAP systems is to be stored. Use the distinguished name syntax that specifies both the name of the container and the path to reach it. Profile parameter: `ldap/saproot` • *Via Active Directory Service:* We do not recommend setting this parameter. If you do no set this parameter, the system automatically calculates the default value to store information in the configuration context for Active Directory Service (ADS). • *Via Generic LDAP Directory* You must specify this parameter.
ABAP System > Defining the Location of the SAP System Instance Directories	*Location of SAP System Executables* **CI/DB/DI**	• *Yes, locate executables on central instance host* This option is the default value, if you use a 64-bit Windows system. Select this option, also in a 32-bit system, if you install your SAP system in a mixed environment. For example, you install it on Windows and UNIX, or in a 32-bit and 64-bit system operating system. • *No preparation for other OS platforms* This option is the default value in a 32-bit system. Choose this option if you use a 32-bit system.

Window	Prompt	Action
	Instance Installation Drive **CI/DB/DI/GW**	Select the drive for the SAP base directory tree. For example, if you select D:, the directory `usr\sap` is created under drive D. If *saploc* already exists, you cannot select the local drive.
	Host with transport directory **CI/DB/DI**	Enter the name of the host where the central transport directory is located.
Oracle > Selecting the Database System Common Parameters	*Database Instance Parameters:* *Database Schema* **CI/DB/DI**	Enter the name of the database schema (`SAP<SCHEMA_ID>`, whereas `<SCHEMA_ID>` must be exactly three characters long). For example, enter `SAPDS1`. We recommend **not** to use the default value `SAP<SAPSID>` for the database schema name. For more information read **SAP Note 617444**.
	Database Home Information: *DB Home* **CI/DB/DI**	Enter the name of the Oracle home.
	Database Server Location: *Drive for server directories,* *Drive for redo log archives (orarach)* **DB**	Select the drives where you want to store your • Server directories (saparch, sapbackup, sapreorg, sapcheck and saptrace) • Redo log archives (oraarch)
Oracle > Changing Server Directory Distribution	– **DB**	Use the *Back* button to change the redo log file archive, sapbackup, sapreorg directories

Window	Prompt	Action
SAP Gateway > Specifying SAP System Instance Directories	Gateway Destination: Installation Drive **GW**	Enter the drive where you want to install the gateway instance.
ABAP System > Specifying Password for User	*OS User Parameters:* *SAP System Administrator* **CI/DB/DI/GW**	• CI: Enter and confirm the password for this user. • DB/DI: Enter and confirm the same password that you used for the central instance. • GW: Enter and cofirm the password for this user. ⚠️ If the `<sapsid>adm` user already exists, use the **same** passwords that you used for this user.
ABAP System > Specifying Password for User	*OS User Parameters:* *SAP System Service Administrator* **CI/DB/DI/GW**	• CI: Enter and confirm the password for this user. • DB/DI: Enter and confirm the same password that you used for the central instance. • GW: Enter and cofirm the for this user. ⚠️ If the `SAPService<SAPSID>` user already exists, use the **same** password that you used for thisd user.
ABAP System > Defining SAP System Service Ports	*SAP System Ports:* *Message Port* **CI/DI**	• CI: Enter the port number of the Message Server. • DI: The port number of the Message Port must be the same as the one on the central instance host.

1.6 Installation Process

Window	Prompt	Action

Oracle > Specifying the Oracle Listener Configuration	*Oracle Listener Configuration:*
	
	Listener Name,
	
	Listener Port
	CI/DB/DI
		• CI:
		Normally, you only have to adapt these parameters if the default name or default port is already in use.
		
		• DB:
		   o If you are installing 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*.
		
		   o If there is already an Oracle database installed on your installation host, you can either use one listener for both databases (in this case, see **SAP Note 98252** for more information) or you have to specify an unused *Listener Name* and an unused *Listener Port* for the new listener.
		
		• DI:
		The port number must be the same as the one on the central instance host.

	Keep Existing Network Configuration Files: *Keep listener.ora,* *Keep tnsnames.ora* **DB**	• If you have already installed an Oracle client or Oracle database instance, you can select these options to keep these files. • For a new installation you do not need to select these options.
Oracle > Specifying the Database Server Parameters	*Advanced Configuration* **DB**	Decide whether you want to perform *Advanced Configuration.* With an advanced configuration, you can specify if you want to configure: • Database file systems • Parameters for database creation • Rollback segment parameters • Tablespace parameters ⚠️ Advanced database configuration should only be performed by certified database administrators. SAP recommends you to use the default settings if possible.

Window	Prompt	Action
Oracle > Selecting the Installation Drives	*Destination Specification* **DB**	SAP recommends you to use the default settings for the database log files, if possible.
Oracle > Configuring the Sapdata Directories	*Sapdata Drives* **DB**	SAP recommends you to use the default settings for the database data files, if possible. If you change the default settings, make sure that the total size of data and log files is greater than or equal to the default size set by SAPinst. You can change the database configuration later with database tools.
SAP Database Load > Specifying General Load Parameters	*Import Settings* **DB**	• If you are installing a new SAP system, this prompt does not appear • If you want to import the database dump of another SAP system as part of a **homogeneous SAP system copy**, leave the field *Migration Key* blank. For more information, see the documentation *SAP Web Application Server Homogeneous and Heterogeneous System Copy*). • If you want to import the database dump of another SAP system as part of a **heterogeneous SAP system copy**, enter the *Migration Key.* For more information, see the documentation *SAP Web Application Server Homogeneous and Heterogeneous System Copy*).
	General Load Settings **DB**	These settings are for experts only.
	Advanced Configuration of Packages **DB**	Decide whether you want to perform Advanced package configuration. These settings are for experts only and should only be performed by certified database administrators. SAP recommends to use the default settings if possible.

1.6   Installation Process

Window	Prompt	Action
ABAP System > Choosing Multi National Language Support (Non-Unicode only)	*Multi National Language Support* **DB**	• If you do not want to install Multi National Language Support (MNLS), choose *No MNLS Support required* • If you want to install Multi National Language Support (MNLS), choose *MNLS Support required*. The installation then will stop before starting the SAP system to let you update the MNLS tables as described in **SAP Note 73606** before continuing the installation. You can also install additional languages later, but if you install any Support Packages in the meantime, you have to do one of the following: • Install the Support Packages again • Use the report RSTLAN_IMPORT_OCS to extract the language-relevant information from each Support Package
Oracle > Setting Passwords of Database Users	*Passwords of OracleDatabase Users* **DB**	Enter and confirm the passwords for the following database users if required: • schema • sys • system • outln • dbsnmp
ABAP System > Registering in System Landscape Directory (SLD)	*Use SLD* **DB**	If you want to use the SAP System Landscape Directory, select *Use SLD*
	SLD Gateway Host **DB**	Enter the name of the gateway host of the SAP System Landscape Directory. To find out the host name, enter **hostname** at the command prompt of the gateway host.
	SLD Gateway Instance Number **DB**	Enter the instance number of the gateway instance of the SAP System Landscape Directory.

Window	Prompt	Action
ABAP System > *Changing Default Password of ABAP Super User*	*User DDIC* **DB**	This prompt does only appear if the password is still set to its initial value. Enter and confirm a new password for user DDIC.
ABAP System > *Changing Default Password of ABAP Super User*	*User SAP** *User SAPCPIC* **DB**	This prompt does only appear if the password is still set to its initial value. If prompted, enter and confirm a new password for user SAP*.

1.7 ⊞ Post-Installation Activities

> Make sure that you read the <u>Installation Checklists [Page 22]</u> before you start the post-installation steps.

1.7.1 ▼ Starting and Stopping the SAP System

Use

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

> The newly installed MMC only allows you to start or stop the SAP system **locally** on the host that you are logged on to. Later you can configure the MMC to enable central management of **all** hosts.
>
> For more information, choose the following in the <u>SAP Library [Page 36]</u>:
>
> *Solution Life Cycle Management* → *Computing Center Management System* → *Monitoring in the CCMS* → *Microsoft Management Console: Windows*

Prerequisites

You have logged on to the SAP system host as user `<sapsid>adm`.

Procedure

Starting the SAP System

1. To start the central services instance, central instance and database instance, do the following:

   a. On the SAP system host, choose *Start* → *Programs* → *SAP Management Console*

   b. Right-click the SAP system node and choose *Start.*

      The central services, central instance, and database start.

2. If you have installed a dialog instance on another host, repeat the above steps on the dialog instance host.

Stopping the SAP System

1. If you have installed a dialog instance on a dialog instance host, you first have to stop the dialog instance before you stop the central services instances, and the database instance. Perform the following steps:

   a. On the dialog instance host, choose *Start* → *Programs* → *SAP Management Console*

   b. Right-click the SAP system node and choose *Stop.*

2. To stop the central services instance, central instance and database instance, do the following:

   a. On the SAP system host, choose *Start* → *Programs* → *SAP Management Console*

b.   Right-click the SAP system node and choose *Stop.*

The database, central services and central instance stop.

1.7.2 Logging On to the SAP System

Use

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

Prerequisites

You have already started the SAP system and installed a front end.

There are two standard users in the SAP system after the installation:

User	Initial Password	Client
SAP*	06071992	000, 066
DDIC	19920706	000

During the installation, SAPinst prompts you to change the passwords for these standard users in client 000.

If for any reason the SAP* and DDIC users still have initial passwords, you **must** change their passwords. Otherwise, there is a serious security risk because it is possible for anyone to log on to your SAP system using the initial passwords.

Procedure

1.   Start *SAP Logon* on the central instance host:

o   SAP GUI for **Windows**:

On the machine, where you have installed the front end, choose:

Start → Programs → SAP Front End<Release> → SAPlogon

o   SAP GUI for **Java**:

Enter the following command from the GUI installation directory:

guilogon

The *SAP Logon* dialog box appears.

2.   Create a logon entry for the newly installed system:

Field	Your Entry
Description of system	Give a meaningful description, for example, the host name of the central instance or the SAP system ID.
Application Server	Specify the name of the central instance host
System number	Specify the number you entered for the central instance during the installation.

When you choose *OK*, the *SAP Logon* dialog box reappears and now includes an entry for the new system.

3.   Double-click the new system entry.

The logon screen for the SAP system appears.

4. Log on as user SAP*.

1.7.3 Installing the SAP License

Use

When you install your SAP system, a temporary license is automatically installed. This temporary license allows you to use the system for four weeks from the date of installation. Before the temporary license expires, you must apply for a permanent license key from SAP. SAP recommends that you do so as soon as possible after you install your system.

Procedure

The procedure to install the SAP license depends on the installation you have performed:

*   If you installed SAP R/3 Enterprise ABAP+Java, see:

    o   *Solution Life Cycle Management* → *SAP Licenses* → *SAP License Key* → *SAP License* in the <u>SAP Library [Page 36]</u>

    o   **SAP Note 94998**

        When you install the SAP Web AS license, a license for the J2EE Engine gets installed automatically.

        You can install several licenses, one for each host running a message server.

        For example, on Windows, this applies if you have an installation with Microsoft Cluster Server (MSCS). The SAP system then searches for the current license.

*   If you installed an SAP Web AS Java for SAP R/3 Enterprise, see *Solution Life Cycle Management* → *SAP Licenses* → *SAP License Key* → *SAP License* → *Licensing of the J2EE Engine* in the <u>SAP Library [Page 36]</u>.

1.7.4 Checking SAP System Services

Use

You need to check that the SAP system services are correctly installed.

This helps you to solve problems that you might experience when trying to log on or run the system for the first time.

Prerequisites

You have <u>logged on to the SAP System [Page 93]</u>.

If you have trouble logging on, or subsequently experience problems trying to run the system, look at the following files located in the directory
\usr\sap\<SAPSID>\DVEBMGS<no>\WORK\:

o   dev_ms

o   dev_disp

  o   `dev_w0`

  o   `dev_rd`

Procedure

1.   Call transaction SM50 to check services.

   The system displays a list of services available for the instance, that is, dialog, update, enqueue, batch, and spool. If you cannot see the services, you can find more information by looking at the files listed above in the first step.

2.   Call transaction SM51 to check all available instances and their services.

   The system displays a list of all available instances.

   If the display is OK, double-click one instance to display the services available for that instance. If the display is empty, you can find more information by looking at the files listed above in the first step.

3.   Call transaction SM21 to check the system log.

1.7.5 ▽ Installing the SAP Online Documentation

Use

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

Procedure

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

To access the SAP Library from your SAP system, choose *Help → SAP Library*.

1.7.6 ▽ Checking the RFC Destination

Use

In a system configuration where the central and database instance run on **different** hosts, you have to test whether the database host has been correctly set up as a remote function call (RFC) destination. The database host must be defined as an RFC destination to enable the system to access monitoring data that is collected for the database and operating system.

Procedure

1.   Choose *Tools → Administration → Network → RFC destinations* or call transaction SM59.

   The initial screen of the transaction displays the different RFC connection types.

2.   Expand *TCP/IP connections* and double-click *SAPOSCOL_<DB_hostname>*.

   A screen displaying information about the selected destination appears.

3.   Choose *Test Connection.*

   If you find that the destination has not been set up correctly, you have to maintain it. For more information, see the following in the SAP Library [Page 36]:

1.7 Post-Installation Activities

Application Platform (SAP Web Application Server) → ABAP Technology → ABAP Programming and Runtime Environment → External Programming Interfaces → RFC Programming in ABAP → Maintaining Remote Destinations

1.7.7 Configuring SAProuter and SAPNet – R/3 Frontend

Use

SAProuter increases network security and simplifies network configuration. SAProuter allows you to make indirect network connections. The SAProuter software is included in the standard SAP system. No additional installation is required. The network administrator normally configures SAProuter.

You require SAProuter if you are using any of the following:

- SAPNet – R/3 Frontend

  SAPNet – R/3 Frontend is the SAP-based service system and provides the technical link between SAP customers and SAP. SAPNet – R/3 Frontend was formerly known as the Online Service System (OSS).

  For more information on setting up and using SAPNet – R/3 Frontend, see the following:

  o *SAP Service Marketplace* at `service.sap.com/remoteconnection`

  o SAP Library [Page 36]

- EarlyWatch

  For more information on Early Watch, see SAP Service Marketplace at `service.sap.com/earlywatch`

Procedure

For a complete list of SAProuter parameters, enter the following at the command line:

`saprouter`

For more information, choose *Application Platform (SAP Web Application Server) → ABAP Technology → Client/Server Technology → SAProuter* in the SAP Library [Page 36].

For information on installing SAProuter as a Microsoft Windows service, see **SAP Note 41054**.

1.7.8 Configuring the Transport Management System

Use

You configure the domain controller in the Transport Management System (TMS) by calling transaction STMS.

Procedure

1. In your SAP system, call transaction STMS.
2. Enter the required information to configure the domain controller.

If you are not sure how to configure the domain controller, choose *Save* and configure the controller later or choose *Information* to display the TMS online documentation.

1.7.9 Performing Basic Operations

Use

You need to perform some basic operations that are described in the SAP Library.

Prerequisites

Open the SAP Library [Page 36].

Procedure

Choose the relevant section to perform the following operations:

✔	Operation	Section in SAP Help Library
	Set up operation modes – transaction RZ04	*Solution Life Cycle Management → System Management → Configuration → Operation Modes*
	Set up logon groups – transaction SMLG	*Solution Life Cycle Management → System Management → Configuration → Dynamic Logon Load Distribution → The SAP Logon*
	Set up administrators	*Solution Life Cycle Management → System Management → Background Processing → Authorizations for Background Processing*
	Schedule background jobs	*Solution Life Cycle Management → System Management → Background Processing*
	Install a printer	*Solution Life Cycle Management → System Management → SAP Printing Guide*
	Configure the system log	*Solution Life Cycle Management → System Management → Tools for for Monitoring the System → System log → Configuring the System Log*

1.7.10 Configured Number of Work Processes

Definition

SAPinst installs SAP systems with a minimum number of work processes calculated using the following formula:

```
#dialog_WP = RAM / 256 (min 2, max 18)

#update_WP = RAM / 768 (min 1, max 6)

#update2_WP = RAM / 1024 (min 1, max 3)

#batch_WP = RAM / 1024 (min 2, max 3)

#enqueue_WP = 1
```

```
#spool_WP = 1
```

Use

This is only an initial configuration to get you started after the installation. It is not detailed enough for a production system because the optimal number of each type of work process depends on the system resources and on the number of users working in each SAP system application.

For a detailed configuration contact SAP Technical Consulting.

1.7.11 Installing Additional Languages

Use

To install an additional language, you need to perform the following steps:

- Classify the language

- Schedule the language transport

- Schedule the language supplementation

> You can also install additional languages later, but if you install any Support Packages in the meantime, you have to do one of the following:
>
> - Install the Support Packages again
>
> - Use the report RSTLAN_IMPORT_OCS to extract the language-relevant information from each Support Package

Procedure

For more information on how to transport an additional language, see *Language Transport*, which you can find in either of the following:

- *SAP Service Marketplace* at **service.sap.com/instguidesNW04** → *Installation*

- SAP Library [Page 36] by choosing *Solution Life Cycle Management* → *Software Change Management* → *Change and Transport System* → *Language Transport.*

1.7.12 Activating the Integrated Internet Transaction Server

Use

The integrated Internet Transaction Server (ITS) was installed automatically with the SAP kernel.

To enable the integrated ITS you have to configure and activate the Internet Communication Manager (ICM) and make sure that the webgui service is activated in the Internet Communication Framework (ICF).

For more information, see the SAP Library [Page 36] and choose *Application Platform (SAP Web Application Server)* → *ABAP Technology* → *UI Technology* → *Web UI Technology* → *ITS/SAP@Web Studio* → *SAP ITS in the SAP Web Application Server*

There you can also find the necessary information if you do **not** want to use the integrated ITS.

1.7.13 Importing Support Packages

Use

You use this procedure to import Support Packages for your SAP system.

Procedure

1. See **SAP Note 737696** for more information about Support Packages for SAP R/3 Enterprise Extension Set 2.00 SR 1.

2. For up-to-date information on currently recommended combinations of Support Packages and patches, also see service.sap.com/sp-stacks.

3. To import a Support Package, download it from SAP Service Marketplace at: service.sap.com/patches

4. Apply Support Packages to your SAP system with the help of the Support Package Manager (formerly called SAP Patch Manager, transaction SPAM).

For more information on the availability of Support Packages, see *SAP Service Marketplac*e at: **service.sap.com/ocs-schedules**

> 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**

1.7.14 Single Sign-On with Microsoft LAN Manager SSP

Use

Single Sign-On (SSO) is a secure method of logging on to the SAP system that simplifies the logon procedure without reducing security. When your system is configured for SSO, an authorized user who has logged on to the operating system can access the SAP system simply by selecting it in the SAP logon window or clicking the shortcut. No SAP system user name or password is necessary. SSO makes it significantly easier for you to manage SAP system users.

In this section, we describe the option that is the easiest to implement when using a full 32-bit Microsoft Windows landscape (Windows 9x, Windows ME, Windows NT, Windows 2000 and higher). It is a tailored version for SSO with Secure Network Communications (SNC), which uses Microsoft's domain authentication, LAN Manager Security Service Provider (NTLM SSP).

For more information on SNC, see the *SNC User's Guide* on SAP Service Marketplace at **service.sap.com/security**

Prerequisites

- Typically, SNC requires an external security product that adheres to the Generic Security Service API V2 (GSS-API V2) interface and that has been certified by the SAP

Software Partner Program. However, in this scenario, we provide a library that adheres to the GSS-API V2 interface on one side and that communicates with Microsoft's NTLM SSP on the other. Since NTLM SSP is already built into Microsoft Windows 32-bit platforms, you do not need to purchase an additional security product to use SSO.

The Microsoft NTLM SSP only provides authentication based on a challenge-response authentication scheme. It does **not** provide data integrity or data confidentiality protection for the authenticated network connection. All third-party BC-SNC certified security products offer data integrity and privacy protection. If you want to use these security features, you have to obtain a certified security product.

If you only use Windows 2000 and higher, we offer an alternative library (`gsskrb5.dll`) that uses the Microsoft Kerberos SSP instead of the NTLM SSP for authentication. For more information, see The Configuration of Kerberos Single Sign-On [Page 104].

We distribute two different versions of the wrapper library for Microsoft's NTLM SSP. The older version is called `gssapi32.dll` and the newer version is called `gssntlm.dll`. For more information on how to get `gssntlm.dll`, see **SAP Note 595341**.

For more information on security aspects of this scenario, see **SAP Note 165485**.

- A pure Microsoft Win32 environment is required (Windows 9x, Windows ME, Windows NT, Windows 2000 and higher). The Microsoft NTLM SSP is **not** available for UNIX or any other operating system.

- Bi-directional trust between Windows domains is required if there are separate domains for users, front-end PCs, and SAP application servers.

- The GSS-API V2 library wrapper (`gssntlm.dll`) must be installed on every application server.

- The GSS-API V2 library wrapper must also be installed on every front-end PC.

- We recommend that you use the 7-bit ASCII character set for all Windows user IDs.

  When the code page of the SAP system is different from the code page on the Windows machines, it is not possible to enter Windows user IDs that contain 8-bit characters into the USRACL table (for example, by calling transaction SU01). The combination of Windows ANSI (=ISO Latin 1) and the default SAP code page 1100 provides the same encoding of 8-bit characters and permits the use of 8-bit characters with `gssntlm.dll`.

Integration

For more information on how to improve the security of your system with third-party products, see the following in the SAP Library [Page 36]:

Security → Network and Transport Layer Security → Secure Network Communication.

Activities

To implement SSO with the Microsoft NTLM SSP you:

1. Start the service *Windows LM Security Support Provider*:

   a. Choose *Start → Programs → Administrative Tools → Services*.

   b. Select the service *Windows LM Security Support Provider*.

c. Choose *General*.

d. Change the startup type from *manual* to *automatic*.

2.

3.

4.

1.7.14.1 Preparing the Application Server for Single Sign-On

Use

You need to perform this procedure as part of

Procedure

1. Copy the `gssntlm.dll` file to the following directory on your central instance:

`<DRIVE>:\USR\SAP\<SAPSID>\SYS\EXE\RUN`

For more information on how to get the `gssntlm.dll, file` see **SAP Note 595341**.

2. Set the environment variable `SNC_LIB` to the location of the library.

3. In the central instance profile, set the following SNC parameters:

snc/data_protection/max =1

snc/data_protection/min =1

snc/data_protection/use =1

snc/enable =1

**snc/gssapi_lib =
(`<DRIVE>:\USR\SAP\<SAPSID>\SYS\EXE\RUN\<gssntlm.dll`>)**

snc/identity/as =p:<DOMAIN_NAME>\SAPService<SAPSID>

`SAPService<SAPSID>` is the user who runs the SAP system.

`<DOMAIN_NAME>` is the Windows domain of this user.

> Although you can freely choose the Windows account under which the SAP system runs, it is normally `SAPService<SAPSID>`.

> If you use a local account for `SAPService<SAPSID>`, most operations are successful. However, any operations or communications where the SAP system initiates SNC-protected communication to a remote machine, do **not** work with a local account for `SAPService<SAPSID>`. Therefore, use a domain account.

Additional SNC Parameters

The following profile parameters let you continue with password-based access to the SAP system when SNC has been enabled. To log on to the SAP system as an administrator to maintain the mapping of Windows user accounts to SAP system user

IDs (user and client), you have to use these additional parameters at least once after enabling SNC. Once the mapping (at least for the administrator) has been entered, you can disable further password-based logons by removing the respective profile parameters.

```
snc/accept_insecure_cpic =1
```

```
snc/accept_insecure_gui =1
```

```
snc/accept_insecure_rfc =1
```

```
snc/permit_insecure_start =1
```

```
snc/permit_insecure_comm =1
```

4. Stop and restart the SAP system to activate the profile parameters. Changes to SNC profile parameters always require an application server restart to take effect.

1.7.14.2 Preparing SAP GUI and SAP Logon for Single Sign-On

Use

You need to perform this procedure as part of Secure Single Sign-On with Microsoft LAN Manager SSP.

Prerequisites

You have completed Preparing the Application Server for Single Sign-On [Page 101] (SSO).

Procedure

1. Copy the `gssntlm.dll` file to the SAP GUI directory.

    For more information on how to get `gssntlm.dll`, see **SAP Note 595341**.

2. Set the Windows environment variable `SNC_LIB` on the PC where your SAP GUI runs.

    The variable specifies the path to the `gssntlm.dll` file. You can do this using one of the following methods:

    o   Copy `gssntlm.dll` to a location of your choice and set the environment variable `SNC_LIB` to that location, for example,
        `<DRIVE>:\<SAPGUI_PATH>\gssntlm.dll`

        i.   Right-click *My Computer* and choose *Properties → Advanced → Environment Variables.*

        ii. In *User Variables for <user>* enter the following:

             Variable: **SNC_LIB**

             Value: **<DRIVE>:\<SAPGUI_PATH>\gssntlm.dll**

        iii. Confirm your entries with *OK.*

        iv. To activate the new environment variable setting, log off system and log on again as the same user.

    o   Copy `gssntlm.dll` to a directory of the default search path, for example,
        `%SystemRoot%\system32` and rename the file to `sncgss32.dll`
        This is the default file name that SNC uses when `SNC_LIB` is neither entered on the command line nor available in the environment.

3. Set the required logon options to activate SSO:

a. In the SAP logon window, choose *Edit → Advanced*

The *Advanced Options* dialog box appears.

b. In the *SNC name* field, enter:

p:<DOMAIN_NAME>\SAPService<SAPSID>

<DOMAIN_NAME> is the Windows domain that the user SAPService<SAPSID> belongs to.

> If the system HWA is running on account SAPServiceHWA of the DEC_NT domain, you enter:
>
> **p:DEC_NT\SAPServiceHWA**

Result

The SAP Logon window now displays an icon with a small yellow key beside the system entry. This indicates that SSO is active.

When the SAP administrator has entered the mapping [Page 103] between a user's Windows account and the user's SAP system user ID, the next time this SAP system user logs on to the system, the application is opened without requiring the user to enter a user name and password.

If only one possible match exists between the Windows account and the SAP system user ID, the logon screen is skipped, unless the profile parameter snc/force_login_screen = 1 is present in the instance profile of the application server.

1.7.14.3 Mapping SAP System Users to Windows Users for Single Sign-On

Use

You need to perform this procedure as part of Secure Single Sign-On with Microsoft LAN Manager SSP [Page 101]. When you have configured your system, you can enable SAP system users to log on with Single Sign-On (SSO) by mapping them to Windows users.

Prerequisites

You have completed the following procedures:

*   Preparing the Application Server for Single Sign-On [Page 101]

*   Preparing SAP GUI and SAP Logon for Single Sign-On [Page 102]

Procedure

1. Log on to the SAP system.

2. Choose *Tools → Administration → User Maintenance → Users* or call transaction SU01.

The *User Maintenance* window appears.

3. Enter the name of the SAP system user and choose *User names → Change*.

4. Choose *SNC*.

5.   In *SNC name*, use **uppercase** to enter the name of the Windows user that is to be assigned to the SAP system user:

`p:<DOMAIN_NAME>\<NT_USERNAME>`

`DOMAIN_NAME>` is the Windows domain that the Windows user belongs to

`<NT_USERNAME>` is the logon ID of the Windows user.

p: is a prefix that all SNC names require.

> For the Windows user `Kissnerj`, belonging to the domain `SAP_ALL`, enter:
>
> **`p:SAP_ALL\Kissnerj`**

6.   Select *Insecure communication permitted.*

This lets the user work in a different domain because it permits the user to access the system without SSO.

7.   Save your entries.

Result

You have now finished setting up SSO.

1.7.15 Single Sign-On with Microsoft Kerberos SSP

Use

Kerberos Single Sign-On (SSO) is a secure method of logging on to the SAP system that simplifies the logon procedure without reducing security. It is suitable if you **only** use Windows 2000 or higher in your system landscape.

When your system is configured for SSO, an authorized user who has logged on to Windows can access the SAP system simply by selecting it in the SAP logon window or clicking the shortcut. No SAP system user name or password is necessary. SSO makes it significantly easier for you to manage SAP system users.

The Application Programming Interface (API) and Kerberos provide the security required for authentication. The advantage of the Kerberos SSO solution is that the security information that has to be exchanged between the SAP front end and the SAP application server is encrypted. In contrast, encryption is **not** implemented for SSO with Microsoft NTLM SSP [Page 98], which is based on the Generic Security Service API (GSS-API) interface

> When using `gsskrb5.dll`, the Microsoft Kerberos Security Service Provider (SSP) is interoperable with Kerberos implementations from other vendors and suppliers. To use SSO with application servers on UNIX and Windows front ends with `gsskrb5.dll`, you might have to purchase a Kerberos implementation for the UNIX machines.

Prerequisites

SSO based on Kerberos can only be set up for users that are members of a Windows domain.

Activities

To implement SSO with the Microsoft Kerberos NTLM SSP, you have to:

The sections that follow describe these steps in detail.

> In the directory paths specified below, `\%win%\` refers to the location of the Windows directory.

1.7.15.1 Preparing the Central Instance

Use

To set up Single Sign-On (SSO) for Kerberos [Page 104], you need to adapt the central instance profile and make sure that the necessary Dynamic Link Library (DLL) is located in the Windows directory.

Procedure

1. Copy the `gsskrb5.dll` file to the following directory on the central instance:

`Drive:\%windir%\system32.`

For more information on how to get the `gsskrb5.dll file, see` **SAP Note 595341**.

2. In the instance profile of the central instance, set the SAP parameters:

snc/enable = 1

snc/gssapi_lib =<DRIVE>:\%windir%\system32\gsskrb5.dll

snc/identity/as =p:SAPService<SAPSID>@<DOMAIN_NAME>

`<DOMAIN_NAME>` is the Windows domain that the `SAPService<SAPSID>` user belongs to, for example, `NT5.SAP-AG.DE`.

> ⚠
>
> `<DOMAIN_NAME>` and the `SAPService<SAPSID> user` are case-sensitive. Make sure that you enter uppercase and lowercase correctly, for example:
>
> `p:SAPServiceC11@NT5.SAP-AG.DE.`

> Although you can freely choose the Windows account under which the SAP system runs, it is normally `SAPService<SAPSID>`.
>
> If you use a local account for the `SAPService<SAPSID>` user, most operations are successful. However, any operations or communications where the SAP system initiates SNC-protected communication to a remote machine, do not work with a local account for the `SAPService<SAPSID> user`. Therefore, use a domain account.

3. Stop and restart the SAP system so that the profile parameters take effect.

1.7.15.2 Configuring the SAP Front End

Use

To set up Single Sign-On (SSO) for Kerberos [Page 104], you need to configure the SAP front ends.

Prerequisites

- You have completed Preparing the Central Instance [Page 105].

- To prepare the SAP front end for SSO, you choose between the following approaches:

  o Configure each SAP front end individually

  You configure each machine where the SAP front end is running.

  o Configure all SAP front ends automatically

  You define a *Group Policy* for a Windows domain. This policy causes the wizard for configuring SSO to be started automatically in the background the next time any member of the domain logs on to an SAP front end.

  These approaches are described below.

Procedure

Configuring SAP Front Ends Individually

1. Log on to the machine where the SAP front end is running.

2. Copy the `SAPSSO.MSI` program to a local directory or to a shared directory on the network.

   For more information, on how to get the `SAPSSO.MSI` file, see **SAP Note 595341**.

3. Double-click the `SAPSSO.MSI` file.

The wizard *SAP Kerberos SSO Support* automatically starts and configures the SAP front end for SSO.

Configuring SAP Front Ends Automatically

1. Log on to a front-end machine as domain administrator of the Windows domain.

2. Copy the program `SAPSSO.MSI` to a **shared** directory.

   For more information, on how to get the `SAPSSO.MSI` file, see **SAP Note 595341**.

3. Choose *Start → Programs → Administrative tools → Active Directory Users and Computers.*

   The dialog box *Active Directory Users and Computers* appears.

4. Right-click the domain for which you want to set up SSO and choose *Properties*.

   The dialog box *<Domain_Name> Properties* appears.

5. Choose *Group Policy → New* to start creating a new policy object.

   The dialog box for creating a new policy object appears.

6. In *Group Policy Object Links*, enter a name for the new policy object, such as `SAPSSO`.

7.   Choose *Edit* to define the contents of the policy.

8.   In the *Group Policy Editor* choose *User Configuration* → *Software Settings* → *Software Installation.*

The *Deploy Software* dialog box appears.

9.   Right-click *Deploy Software* and choose *New* → *Package*.

The *Open* dialog box appears.

10.   Select the file `SAPMSSO.MSI` from the shared location.

11.   Specify the path with the UNC name (`\\<hostname>\<share>`).

12.   Select *Assign* and confirm with *OK*.

You have now created a new *Group Policy.*

The next time any user logs on to the domain with the SAP front end, the wizard *SAP Kerberos SSO Support* automatically starts and configures the front end for SSO.

1.7.15.3   Activating Single Sign-On for the SAP Logon

Use

To set up Single Sign-On (SSO) for Kerberos [Page 104], you need to activate the SAP logon option for SSO on each SAP front end.

Prerequisites

- You have completed the following:

    o   Preparing the Central Instance [Page 105]

    o   Configuring the SAP Front End [Page 106]

- The *SAP Logon* window includes a list of systems or machines that you can log on to. For each of the systems or machines in the list for which you want to implement SSO, follow the procedure below.

Procedure

1.   Select an entry in the *SAP Logon* window and choose *Properties* → *Advanced*.

2.   Select *Enable Secure Network Communications*.

3.   In *SNC name*, enter:

p:SAPService\<SAPSID\>@\<DOMAIN_NAME\>

where `<DOMAIN_NAME>` is, for example, `NT5.SAP-AG.DE`.

> Enter the same string that you entered in the central instance profile for `snc/identity/as`
>
> If the system *C11* is running on account `SAPServiceC11` of the domain `NT5.SAP-AG.DE`, you would enter:
>
> **P:SAPServiceC11@NT5.SAP-AG.DE**

> If the entry you selected in the logon dialog box is a group entry, for example, *C11 (PUBLIC)*, the *SNC name* field is already filled.

4.   Choose *OK* to confirm your entries.

The *SAP Logon* window now displays an icon with a key beside the system entry. This indicates that Single Sign-On is active for the system.

1.7.15.4   Mapping SAP Users to Windows Users

Use

To set up Single Sign-On (SSO) for Kerberos [Page 104], you need to authorize SAP users to log on with SSO by assigning them to Windows users.

Prerequisites

You have completed the following:

* Preparing the Central Instance [Page 105]
* Configuring the SAP Front End [Page 106]
* Activating Single Sign-On for the SAP Logon [Page 107]

Procedure

1.   Log on to the SAP system as administrator.

2.   Choose *Tools → Administration → Maintain Users → Users* or call transaction SU01.

   The *User Maintenance* window appears.

3.   Enter the name of the SAP user and choose *User names → Change.*

4.   Choose *SNC.*

5.   In *SNC name*, use **uppercase** to enter the name of the Windows user that is to be assigned to the SAP user:

`p:<WINNT_USERNAME>@<DOMAIN_NAME>`

where `<WINNT_USERNAME>` is the logon ID of the Windows user and `<DOMAIN_NAME>` is the Windows domain that the user is logged on to.

> For the user Kissnerj, belonging to the domain `NT5.SAP-AG.DE` , enter:
>
> `p:kissnerj@NT5.SAP-AG.DE`

6.   Select *Insecure communication permitted.*

   This lets the user work in a different domain because it permits the user to access the system without SSO.

7.   Save your entries.

Result

Kerberos SSO is now set up.

1.7.16 ⬇ Performing the Client Copy

Use

You use this procedure to perform the client copy, which consists of the following steps:

- Maintain the client with transaction SCC4
- Copy the client with local transaction SCCL
- Copy the log files with transaction SCC3

Procedure

For more detailed information on how to perform the client copy, see the separate documentation in the SAP Library [Page 36]:

Solution and Life Cycle Management → Software Change Management → Change and Transport System → Client Copy and Transport

1.7.17 Scheduling Asynchronous Indexing and Deindexing

Use

> This step is only needed if you use the Knowledge Provider (KPRO) component. For more information on KPRO see SAP Library [Page 36] and choose *Application Platform (SAP Web Application Server) → Business Services → Knowledge Provider.*

Asynchronous indexing and deindexing is triggered using the report *RSTTIRIDX*. You should schedule this report as a daily background process.

> The report RSTIRIDX starts the indexing and deindexing of scheduled documents, and logs indexing errors in the productive system. The chosen recipient can view the contents of the report using the transaction SO01. If an error occurs, check check in IMS Monitoring [Page 110]).

Prerequisites

To use a report, you need *Batch Administrator* authorization for the authorization object *Batch Processing.*

Procedure

1. In the SAP system, call transaction SM36 or choose *System → Services → Jobs → Define Jobs* from the menu.

   The *Define Background Job* screen appears.

2. In the field *Job name*, enter `INDEXING`.

3. In the field *Job class*, choose *B*.

4. In the field *Target Server*, enter the name of the host on which the background process is to be performed.

5. Choose *Spool list Recipient.*

The *Recipient Determination* dialog box appears .

6. In the field *Recipient*, enter the name of the desired recipient. Then select the required *General Attributes*, and choose *Copy*.

7. From the application toolbar on the Define Background Job screen, choose *Start condition*.

The *Start Time* dialog box appears.

8. Choose *Date/Time.*

9. Enter the required start date and time.

10. Select the option *Periodic Job* anf choose *Period Values*

The *Period Values* dialog box appears.

11. Choose *Daily*.

12. Choose *Save.*

13. On the *Start Time* dialog box, choose *Save* again.

14. From the application toolbar, choose *Step*.

The *Create Step* dialog box appears.

15. Choose *ABAP program*.

16. In the *ABAP Program* group box, enter the name RSTIRIDX in the *Name* field.

17. Choose *Print specifications*.

The *Background Print Parameters* dialog box appears.

18. Enter the name of the output device and choose *Properties.*

The *Spool Request Attributes* dialog box appears

a. On the Overview tab, select General Properties and double-click Time of Printing.

b. In the group box Other Properties "Time of Printing", choose the option Print out immediately from the listbox.

c. Confirm your entries with O.K.

1.7.176.1 Checking for Problems in IMS Monitoring

This step is only needed if you use the Knowledge Provider (KPRO) component.

Procedure

1. In the SAP system, choose transaction SKPR07.

2. In the *Extras* area, choose *Scheduled Documents.*

The system displays a list of documents to be indexed or deindexed. The following information is available:

   o Client

   o Name of index category (32-place GUID)

   o Document class

   o Document language

  o Processing type (I = indexing, D = deindexing)

  o The number of scheduled documents for this index category

3. To see details on the scheduled documents, select the required list entry and choose *View*.

4. To see the number of attempts to index or deindex individual documents, select the required documents and choose *View.*

If an error has occurred whilst a document was being indexed or deindexed, it is scheduled for the process again. If the number of retries is large, there is probably an error that is preventing the indexing or deindexing of the document in general. Select such documents in the list of scheduled documents, and delete them.

Documents that could not be indexed or deindexed at the first attempt (including those documents that you have deleted from the list of scheduled documents manually) are treated by the system as problem cases.

5. To see a list of problem cases, call transaction SKRPR07 and choose *Problems.*

You can filter this list by document class and by the number of attempts to index or deindex a document.

You can delete the listed documents, or you can mark them to be indexed or deindexed again.

1.7.18   Performing a Full Backup

Use

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:
  - o The SAP system
  - o SAP-related services (`SAP<SAPSID>_<instance>` and `SAPOSCol`)
  - o 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.*

c. The *Emergency Repair Diskette* dialog box appears.

d. 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

\USR\SAP\TRANS

<HOMEDIR> of <sapsid>adm

\%WINDIR%
```

> The directory `\USR\SAP\TRANS` is only required for SAP systems that have the ABAP engine installed.

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.

1.7.19 Changing Passwords of Created Users

Use

You need to change the passwords of the users that SAPinst creates during the installation. The table below lists these users. You also need to remove the contents of the installation directory and store them securely because otherwise they might represent a security risk.

Procedure

Change the passwords of these users according to the *SAP Security Guide*.

For more information, see SAP Service Marketplace at
service.sap.com/securityguide

> • SAP system users might exist in more SAP system clients than listed below (for example, if a user was copied as part of the .

- We strongly recommend that you change the initial passwords even if SAPinst prompted for a new password during the installation procedure.

User Type	User	Comment
SAP system user	SAP*	User exists at least in SAP system client 000
	DDIC	User exists at least in SAP system clients 000 and 066
	EARLYWATCH	User exists at least in SAP system client 066
	SAPCPIC	User exists at least in SAP system client 000
Oracle database user	SAP<SCHEMA_ID>	Oracle database owner (the owner of the database tables)
	SYSTEM	–
	SYS	–
	OUTLN	–
	DBSNMP	–

1.8 Additional Information

1.8.1 Remote Installation with SAPinst

Purpose

You can run the SAPinst GUI in standalone mode to perform a remote installation.

This enables you to install an SAP system on another host (the remote host) while monitoring the installation with the SAPinst GUI on your local Windows or UNIX computer (the local host).

Prerequisites

- Make sure that you have performed the preparation activities for your local host (SAPinst GUI host) and your remote host.

  For more information, see *Installation Preparations* in this documentation.

- 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>`.

Process Flow

1. You start SAPinst on the remote host [Page 114].

2. You start SAPinst GUI on the local host [Page 115].

3. You perform the installation using the SAPinst GUI.

1.8.1.1 Starting SAPinst on the Remote Host

Use

You use this procedure to run SAPinst on the **remote** host when you want to run SAPinst as a remote installation [Page 114]. The remote host is the host where you want to install the SAP system.

Procedure

Your Remote Host Runs on a Windows Platform

1. Log on to your remote host as a user who is a member of the local administration group.

2. Insert the installation DVD in your DVD drive.

3. Enter the following commands from the Windows command prompt:

   `cd <DVD drive>:\IM<x>\SAPINST\NT\<platform>`

   `sapinst.exe SAPINST_START_GUI=false`

   SAPinst now starts and waits for the connection to the SAPinst GUI. That is, 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 on the Local Host [Page 115].

Your Remote Host Runs on a UNIX Platform

1. Log on to your remote host as user `root`.

2. Mount the Installation Master DVD.

3. Enter the following commands:

   cd <SAP_Installation_Master_DVD>/IM<x>/SAPINST/UNIX/<OS>

   sapinst SAPINST_START_GUI=false

   SAPinst now starts and waits for the connection to the SAPinst GUI. That is, 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 the SAPinst GUI on your local host, as described in Starting SAPinst GUI on the Local Host [Page 115].

1.8.1.2 Starting SAPinst GUI on the Local Host

Use

You use this procedure to run SAPinst GUI on the **local** host when you want to run SAPinst as a remote installation [Page 114]. The local host is the host where you want to control the installation with the SAPinst GUI.

Procedure

Your Local Host Runs on a Windows Platform

1. Log on to your local Windows host.

2. Insert the Installation Master DVD into your DVD drive.

3. Enter the following commands from the Windows command prompt:

   cd <DVD drive>:\IM<x>\SAPINST\NT\<platform>

   startinstgui.bat

   SAPinst GUI now gets started and connects automatically to the host that is waiting for a connection. The *SAP Installation GUI Connection* dialog appears.

4. Enter the host name of the *Installation Host* and the same *Port* as SAPinst uses on the remote host and choose *OK*.

   SAPinst GUI now connects to the SAPinst server and the first dialog of the installation appears.

5. Perform the installation from your local host.

Your Local Host Runs on a UNIX Platform

1. Log on to your local UNIX host as user `root`.

---

2.   Mount your Installation Master DVD.

3.   Enter the following commands:

`cd <SAP_Installation_Master_DVD>/IM<x>/SAPINST/UNIX/<OS>`

`./startInstGui.sh`

The SAPinst GUI now gets started and connects automatically to the host that is waiting for a connection. The *SAP Installation GUI Connection* dialog appears.

4.   Enter the host name of the *Installation Host* and the same *Port* as SAPinst uses on the remote host and choose *OK.*

SAPinst GUI now connects to the SAPinst server and the first dialog of the installation appears.

5.   Perform the installation from your local host.

1.8.2 ⬛ Interrupted Installation with SAPinst

Purpose

SAPinst does not abort the installation in error situations. Therefore, you can continue an interrupted installation when you have:

- **Not** canceled the installation

  That is, the error dialog box is still displayed and SAPinst is waiting for your input. You proceed by choosing *Retry* in the error dialog box.

  SAPinst now retries the installation step.

- **Already** canceled the installation

  That is, the installation was aborted. There are the following situations:

If you have canceled with…	Meaning
Stop	Since SAPinst records the installation progress in the keydb.xml file, you can continue the installation from the failed step without repeating previous steps. During this procedure, you can *Reset* the installation, too, if required.
Reset	You must restart from the beginning, that is, with the default keydb.xml file as delivered. ⚠️ In some cases, you must uninstall already installed components, before repeating the installation from the beginning. For example, this applies to an SAP system installation. For more information, see the description on how to de-install a component in the corresponding installation guide.

If you do not want to continue the installation and you want to terminate SAPinst, do one of the following:

- 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 → Exit.*

Prerequisites

You have solved the problem that caused the error situation.

Procedure

1. Log on to your remote host as a user who is a member of the local administration group.

2. Insert the Installation Master DVD in your DVD drive.

3. Enter the following command from the Windows command prompt:

```
cd <DVD drive>:\IM<x>\SAPINST\NT\<platform>
```

```
sapinst.exe
```

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

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

If there is only one component to install, SAPinst directly displays the dialog *What do you want to do?* without presenting the *Welcome* screen.

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

Alternative	Behavior
Run a new Installation	The installation will not be continued.
	Instead, SAPinst deletes the mentioned installation directory for the chosen installation service and starts the installation from the beginning.
	The log files from the old installation are put into a backup directory with the following naming convention: `<log_day_month_year_hours_minutes_seconds>` (for example, `log_01_Oct_2003_13_47_56`).
Continue old installation	The installation of the mentioned installation service **will be continued** from the point of failure.

UNIX

1. Log on to your local UNIX host as user root.

2. Mount your Installation Master DVD.

Mount the DVD locally. We do **not** recommend using Network File System (NFS).

3.   Enter the following command:

    cd <SAP_Installation_Master_DVD>/IM<x>/SAPINST/UNIX/<OS>

    ./sapinst

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

> If there is only one component to install, SAPinst directly displays the dialog
> *What do you want to do?* without presenting the *Welcome* screen.

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 choose *OK.*

Alternative	Behavior
Run a new Installation	The installation will not be continued.
	Instead, SAPinst deletes the mentioned installation directory for the chosen installation service and starts the installation from the beginning.
	The log files from the old installation are put into a backup directory with the following naming convention: `<log_day_month_year_hours_minutes_seconds>` (for example, `log_01_Oct_2003_13_47_56`).
Continue old installation	The installation of the mentioned installation service **will be continued** from the point of failure.

1.8.3 ⬚ Deletion of an SAP System Installation (ABAP)

Purpose

This section describes how to delete a (J2EE) dialog instance, a J2EE Add-In installation, or
a complete SAP system.

Process Flow

> 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.

Deleting a J2EE Dialog Instance

You delete the J2EE dialog instance. For more information, see <u>Deleting an SAP Instance</u>
<u>[Page</u> 119].

Deleting a J2EE Add-In Installation

If you have an SAP system based on SAP Web AS ABAP+Java and you only want to delete the J2EE Add-In installation (that is, the SAP system (ABAP) is not deleted), see the documentation *Installation Guide – SAP Web Application Server Java 6.40 on Windows: Oracle*, section *Deletion of an SAP System Installation (J2EE)*.

Deleting a Complete SAP System

1. You delete all SAP instances [Page 119], including the (J2EE) dialog instances, if there are any.

2. You delete the database instance (see the corresponding section below).

1.8.3.1 Deleting an SAP Instance

Use

You use this procedure to delete particular SAP instances, for example, a (J2EE) dialog instance, or a a complete SAP system.

> When you delete a SAP system installation [Page 118], you need to uninstall the SAP instance software.

Prerequisites

The SAP system is stopped and the database is shut down.

Procedure

> We recommend to use perform this procedure only, if you have performed a full backup of your SAP system.

> If you want to delete a J2EE dialog instance in an SAP R/3 Enterprise ABAP+Java installation which is installed on the same host than the central instance, you have to use the procedure as described in Deletion of an SAP System Installation [Page 118].

1. Log on as a user with domain administration rights.

2. Choose *Start → Settings → Control Panel → Add/Remove Programs*.

3. The *Add/Remove Programs* dialog box appears.

4. Find the SAP entries.

> Each SAP instance that is installed on the computer is listed with an entry like *SAP Application Server for System <SAPSID>instance*

5. Choose *Remove*.

The *SAP Uninstall Wizard* starts.

6. Choose *Next* in the *Welcome* window.

1.8   Additional Information

The dialog box *Uninstalling SAP System* appears for you to select an uninstall method:

⚠️

Depending on your selection, note the following when using the checkbox to delete an SAP instance:

- If your checkbox is marked gray, you delete or uninstall the following:
  - The SAP instance directory, for example:
    `usr\sap<SAPSID>\D00`
  - Services, for example `SAP<SAPSID>_00`
  - The whole system directory, for example
    `usr\sap\<SAPSID>\*`
- If your checkbox is marked black, you delete or uninstall the following:
  - The SAP instance directory, for example:
    `usr\sap<SAPSID>\D00`
  - Services, for example `SAP<SAPSID>_00`
  - The whole system directory, for example
    `usr\sap\<SAPSID>\*`
  - Local and domain user accounts
- If you have different SAP instances that use the same `<SAPSID>`, you can delete the instance directory only.

Uninstall Method	Action
Typical	Select this if you want to completely uninstall the selected SAP instance(s). 💡 • If you uninstall the central instance, the checkbox is marked black. • If you uninstall the dialog instance, the checkbox is marked gray. Choose *Finish* to delete the SAP instance.
Complete	Select this if you want to uninstall **all** the SAP instances that are installed on the local computer. ⚠️ • All instances are marked with a black checkbox. • This uninstall method removes **all** the SAP instances listed in the *Add/Remove Programs Properties* dialog box, regardless of the highlighted selection. Choose *Finish* to delete all local SAP instances.

Uninstall Method	Action
Custom	Select *Custom* and choose *Next* to access the *Select Components* dialog box that allows you to mark the instances you want to remove.
	In the *Select Components* dialog box, use the check box beside an instance to indicate whether only the instance involved or the entire system, with global accounts, is to be deleted.
	Uninstall instance-independent components
	Select this additional option, if there is no other SAP system on the local machine. With this option you can delete for example the saposcol program.
	Add
	Choose this option to manually add instances you want to delete if they do not appear on the list.
	Finish
	Choose to start the deletion.

The wizard informs you when the SAP system or selected instances have been deleted successfully.

1.8.3.2   Deleting the Oracle Database

Use

> If you have multiple components installed in one database (MCOD), delete the database only if you want to delete all contained components as well.
> Otherwise, delete components on a selective basis (see **SAP Note 399910**).

This section describes how to delete an database instance and the Oracle database that you have installed.

For the SAP R/3 Enterprise ABAP+Java installation, you also have to delete the J2EE database schema that was installed into the existing database of SAP R/3 Enterprise.

Prerequisites

- Before deleting the database or the J2EE database schema, stop all SAP instances belonging to this database or to this J2EE database schema.

- We recommend you to delete the SAP instances before deleting the database instance or the J2EE database schema.

- You have stopped or already deleted the SAP central instance.

Procedure

> Use the following procedure if there is only a single Oracle_Home in your system.
>
> If the instance of a second SAP system is running on the same machine as the database, this means the database software still has to be accessed by the second system.

Deleting the Database Instance

To delete the database instance:

1. Log on as local administrator.

2. Delete the Oracle instance:

a. Open a command prompt and switch to the directory

```
<DRIVE:\Oracle_Home\bin
```

b. Enter:

`oradim -delete -sid <DBSID>`

3. Delete the `ORACLE\<DBSID>` directories on all drives. This includes the directories containing the SAP data.

4. Delete the following files from the directory `<DRIVE>:\ORACLE_HOME\database\`

`init<DBSID>.dba`

`init<DBSID>.ora`

`init<DBSID>.sap`

5. Delete the following files from the directory
   `<DRIVE>:\ORACLE_HOME\Network\Admin`

`listener.ora`

`tnsnames.ora`

`sqlnet.ora`

> If a second instance is installed on the host do not delete these files. Open the files `listener.ora` and `tnsnames.ora` in an editor and remove all references that include the name of the system `<DBSID>` that is being removed.

6. Delete the groups `ORA_<DBSID>_DBA` and `ORA_<DBSID>_OPER`:

a. Choose:

Start → Programs → Administrative Tools → Computer Management

b. Choose *Local Users and Groups → Groups.*

c. Select and delete the local groups `ORA_<DBSID>_DBA` and `ORA_<DBSID>_OPER` with *Action → Delete*

Deleting the Oracle Database Software

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

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 home directory and all its subdirectories under
   `<DRIVE>:\ORACLE_HOME`

3. 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*

4. 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`

   d. Also delete Oracle from the `PATH` variable.

5. 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.

SAP R/3 Enterprise ABAP+Java: Deleting the J2EE Database Schema

> Before deleting the J2EE database schema, make sure that you have a recent offline database backup.

1. Log on as user who is a member of the local administration group.

2. Start `sqlplus` and shutdown the database with the following commands:

sqlplus /nolog

SQLPLUS> connect / as sysdba

SQLPLUS> shutdown immediate

3. Enter the following command to delete the database objects of the database schema:

```
SQLPLUS> drop user SAP<SAPSID>DB cascade;
```

4. Enter the following command to get the file name of the corresponding data file in the file system:

```
SQLPLUS> select file_name from dba_data_files where  \

  tablespace_name = 'PSAP<SAPSID>DB';
```

5. Enter the following command to delete the tablespace of the database schema:

```
SQLPLUS> drop tablespace PSAP<SAPSID>DB including contents;
```

6. Exit sqlplus with the command:

```
SQLPLUS> exit
```

7. Delete the data file of tablespace **PSAP<SAPSID>DB** from the file system.

1.8.4 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 virtual user account that is required to start the SAP system. It has the local user right to *log on as a service* and is a member of the local administrator's group.

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.

User Groups and Accounts
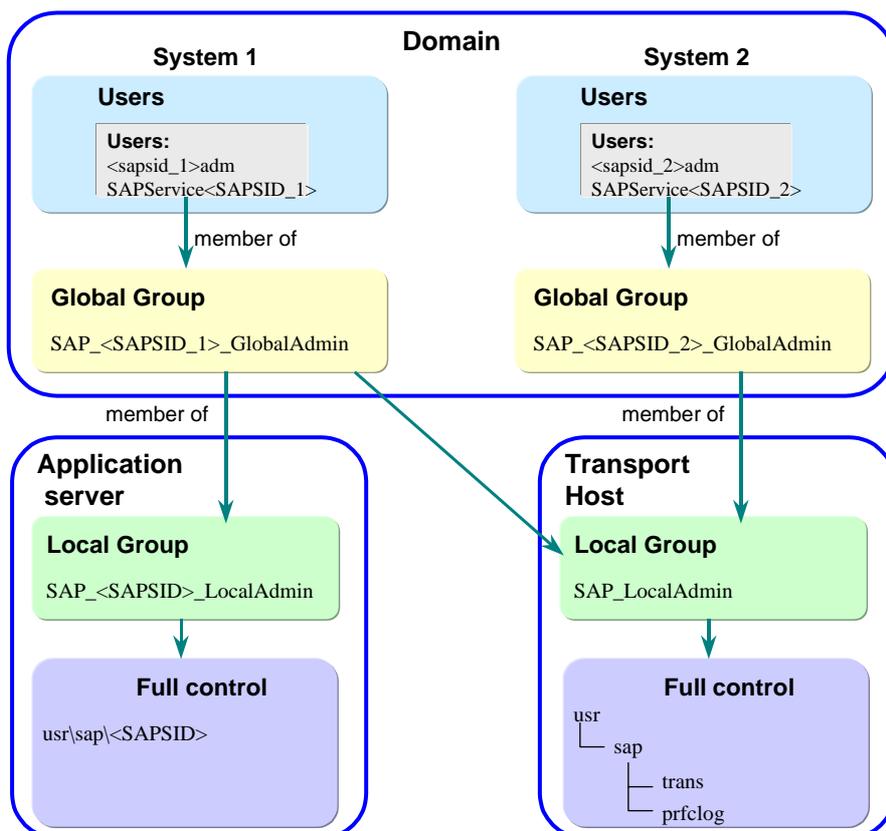
1.8   Additional Information

> 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`

1.8.4.1   Automatic Creation of Accounts and Groups

Use

SAPinst automatically creates the accounts and groups required for the secure operation of the SAP system with Windows [Page 124] during the installation.

Features

The following graphic shows the steps that SAPinst performs to create the users and groups for a **domain** installation.

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 NT `local Administrators` Group ↓ Addition of `<sapsid>adm` to the NT `Domain Users` group.

Creation and modification of local group on each application server	Creation of a local group on the application server **Local Group :** `SAP_<SAPSID>_LocalAdmin` ↓ Addition of the global group `SAP_<SAPSID>_GlobalAdmin` to the local group `SAP_<SAPSID>_LocalAdmin` ↓ Creation of a local group on the application server **Local Group :** `SAP_LocalAdmin` ↓ 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

Assignment of rights for the SAP directories	**For** `Administrators` **and** `SAP_Local Admin` **groups assignment of Full Control over:**
	`usr`
	`usr\sap`
	`usr\sap\prfclog`
	↓
	For `Administrators` **and** `SAP_<SAPSID>_LocalAdmin` **groups Assignment of Full Control over:**
	`usr\sap\<SAPSID>`

1.8.4.2 ▼ Manually Granting User Rights for the Installation

Use

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 Admins` group and be authorized to:

- Act as part of the operating system
- Increase quotas (Windows 2000)
- Adjust memory quotas for a process (Windows Server 2003)
- Replace a process-level token

The procedure below assigns these rights to a user of your choice.

⚠️

> Be aware that domain policies override locally defined policies. This means that if you want to grant domain administration rights for a local user, make sure tthat you have also defined domain administration 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. For Windows 2000, double-click the respective right under *Policy* and choose *Add.*

4. For Windows Server 2003, double-click the respective right under *Policy* and choose *Add User or Group.*

5. In the *Select Users and Groups* window, choose the required user and choose *Add.*

   The selected user appears in the box below.

6. Confirm your entry and then repeat the steps for each remaining policy that the user requires for the installation.

7. Log off from your system and log on again to apply the changes.

See also:

Granting User Rights for the Installation [Page 57]

2 ⊓ Cluster Installation with MSCS

Purpose

When you install an SAP system, you can decide to set up a Microsoft Cluster Server (MSCS) configuration. For this type of installation, you have to set up the system on two clustered hosts (called "nodes") and configure it so that it can take advantage of the MSCS software. The MSCS software offers features that can improve the availability of the system and safeguard it against failure and unplanned downtime. Ideally it enables 24-hour operation, 365 days a year.

With an MSCS installation you set up the database and central instance on two separate clustered machines with the aim of enabling critical system components to be automatically switched from one machine to the other if hardware problems arise. Under normal production operation, the central instance runs on one of the machines and the database on the other. In the event of hardware failure, the critical resources located on the failed machine are switched over to the healthy machine, so that unplanned system downtime is avoided. With the help of this switchover – or failover – mechanism, the system can continue functioning normally, even after a critical hardware error has occurred.

Apart from enabling failover when hardware problems occur, you can also use the cluster configuration to avoid downtime when you perform essential system maintenance. For example, if you need to maintain the database node, you can deliberately switch the database to the node where the central instance is running and operate it there until the database node is again ready for production. While maintenance is in progress, the central and database instance temporarily operate on the same node. When maintenance work is finished, you can easily move the database back to its original node and continue operating it there.

- When you are setting up the SAP system in an MSCS configuration, the process is a combination of standard installation steps which are described in earlier sections of this documentation **and** supplementary, cluster-specific steps which are escribed in detail in this part of the documentation.

- In this documentation the two hosts in the cluster are referred to as node A and node B

Prerequisites

Read the following installation notes before you begin the installation, as they contain the most recent information regarding the installation, as well as corrections to the documentation.

Note Number	Title
751411	Windows-specific information about the SAP R/3 Enterprise 4.7 Ext. Set 2.00 SR1 installation and corrections to this documentation.
676073	Cluster-specific information about the SAP Web AS 6.40 system installation and corrections to that documentation.
675940	Oracle-specific information about the Web AS 6.40 system installation and corrections to this documentation.

Process Flow

The process of setting up a SAP system on an MSCS configuration differs, depending on whether you want to:

- Install a new SAP system on cluster hardware
- Move an existing SAP system to cluster hardware

Installing a New SAP System on Cluster Hardware

If you intend to run a new SAP system on a cluster, the process of installing your system is as follows:

1. Standard Installation for MSCS

    In this phase you perform a standard SAP system installation, but perform a number of supplementary steps specially required for the cluster configuration:

    o   Since the cluster hardware has two nodes that have access to both local and shared storage devices, you have to install some components on both nodes and observe special rules for distributing components to local or shared disks.

    o   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.

2. **Conversion to MSCS**

    In this phase you configure the database and SAP system so that they can take advantage of the cluster functionality provided by the MSCS software.

Moving an Existing SAP System to Cluster Hardware

If you have an existing SAP system and plan to migrate to a cluster with new hardware, the procedure is essentially the same as for a new system. You have to install the SAP system on the new hardware and subsequently convert the system for cluster operation.

However, you install the SAP system using a system copy. Therefore, you have to prepare for the installation by creating a copy of the database. Afterwards, instead of loading the database from the Export CDs in the installation package, you load it using your exported database.

Depending on your source and target system, you might either have to perform a homogeneous or heterogeneous system copy:

- If the original system and target system have the **same** operating system and database, you perform a **homogeneous** system copy.

  For more information, 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*

- If the original system and target system have a **different** database or operating system, you perform a **heterogeneous** system copy. A prerequisite for this type of copy is a migration package that you can order from SAP.

  For more information, 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*

  For further information, see also: `service.sap.com/ osdbmigration`

Once you have installed your system on the new hardware following the instructions for a system copy, you can convert your system to a cluster as described in the Conversion to MSCS [Page 153].

> ⚠️
>
> The documentation for a homogeneous or heterogeneous system copy does not include the cluster-specific information you need for cluster hardware. It is therefore important to also carefully read this guide and follow all additional instructions given for the cluster.

2.1 ⬚ Installation Planning for MSCS

Purpose

You need to plan the installation of the SAP system on cluster hardware using Microsoft Cluster Server (MSCS).

Process Flow

1.   You distribute components to disks for MSCS [Page 132].

2.   You obtain addresses for MSCS [Page 137].

3.   You check the hardware requirements for MSCS [Page 140].

4.   You check the software requirements for MSCS [Page 141].

> The cluster hardware is equipped with two sets of disks:
>
> - Local disks that are attached directly to one of the nodes
>
> - Shared disks that can be accessed by both nodes via a shared interconnect.
>
> You need to work out which components have to be stored on local disks, which on shared disks, and which have to be separated to different disks for performance and security reasons.

2.1.1 ⬚ Distribution of Components to Disks for MSCS

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

- Disk arrays connected locally to node A

- Disk arrays connected locally to node B

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

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

- Separately on both node A and B to use the local storage on each node

- Once on the shared storage that is used in common by nodes A and B

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

Software Distribution on a Cluster System with RAID
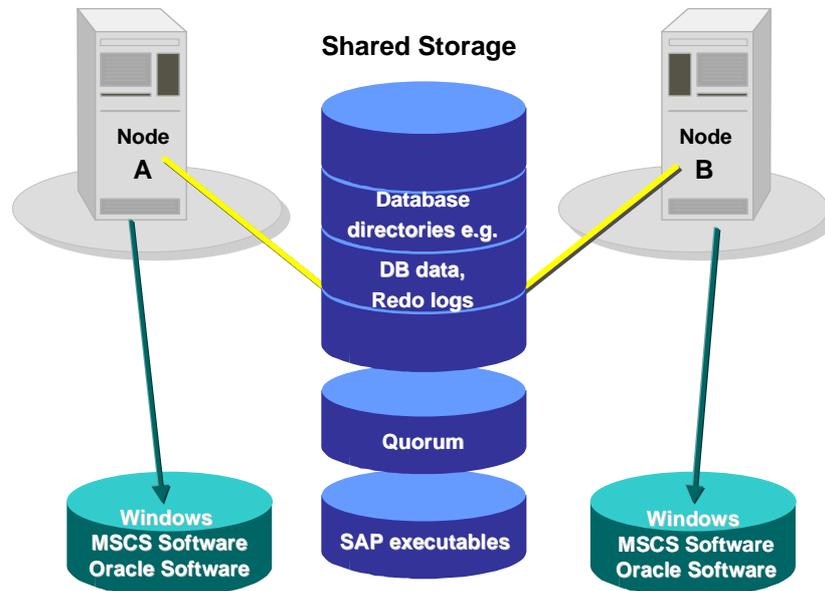
The Oracle server software in the ORACLE HOME directory must have the same drive letter and path on both nodes.

Quorum Disk

The MSCS quorum disk 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 failover to the node that owns the quorum disk.

The default quorum log size is 64 MB. If you use a large number of shares, the quorum disk size may be too small.

To increase the quorum log size, carry out the following steps:

a. Right-click the cluster group and choose *Properties*.
b. Select *quorum log* and increase the value to 4096 in the Size box.

For more information, see also the Microsoft Knowledge Base Article 225081.

Database Directories

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

- Do **not** reside on the same RAID volumes as the SAP program files or the quorum resource.

- Reside on several different RAID volumes, for security and performance reasons

2.1 Installation Planning for MSCS

Depending on the disks available and the size of your system, various disk configurations are possible, but you must always locate the database data and redo logs on **separate** volumes. The following graphic shows a secure method to distribute the database directories to volumes. For more information on other options, see .

Database RAID Volumes
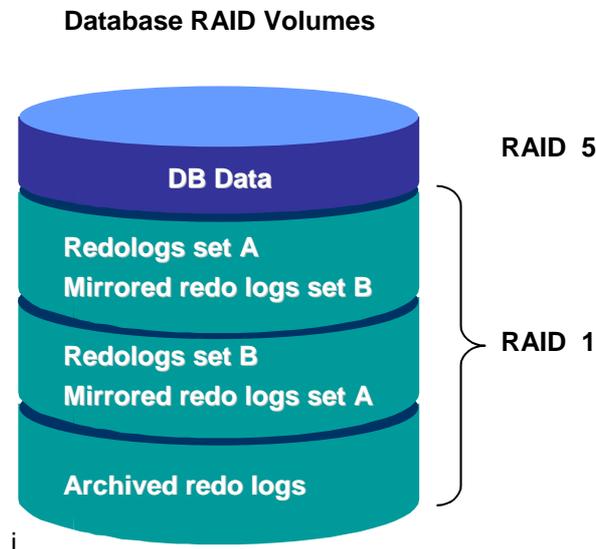
Note that the BR*Tools directories `\sapreorg, \saptrace, \sapbackup,\sapcheck` are not shown in the graphic. You can locate these directories on any of the database volumes as they do not require special security measures.

2.1.1.1 Directories in an MSCS Configuration

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

Directories on Local RAID Volumes on Both Node A and B

Component	Default Directory	Minimum Size
A supported operating system [Page 141]	`\%windir%`	1.5 GB
MSCS Software	`\%windir%\Cluster`	10 MB
SAP cluster files	`\%windir%\SAPCluster`	20 MB
Oracle server software	`\oracle\<SAPSID>\920`	2.2 GB
Oracle Fail Safe Software	`\oracle\OFS`	400 MB

Directories on Shared Volumes

Component	Default Directory	Minimum Size
Cluster *quorum resource*	`\MSCS`	100 KB
SAP executables	`\usr\sap ...`	1 GB
SAP data files	`\ORACLE\<SAPSID>\<SAPSID>DATA1 ... \<SAPSID>DATA<n>`	25 GB approx

Online redo logs, set A	`\ORACLE\<SAPSID>\origlogA`	400 MB
Online redo logs, set B	`\ORACLE\<SAPSID>\origlogB`	400 MB
Mirrored online redo logs, set A	`\ORACLE\<SAPSID>\mirrlogA`	400 MB
Mirrored online redo logs, set B	`\ORACLE\<SAPSID>\mirrlogB`	400 MB
Backup of online redo logs	`\ORACLE\<SAPSID>\oraarch`	5 - 100 GB
BR*Tools directories	`...\sapreorg, \saptrace,` `...\sapbackup, \sapcheck,` `...\saparch`	2 GB

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 is created under the system directory: `%WINDIR%\SapCluster`
This contains all the SAP files required by both cluster nodes, independently of the node the SAP instance is running on. The files are database tools and program files (executables) used by the operating system monitor (SAPOsCol).
The directory is added to the path variable of the user `<SAPSID>adm`.

2.1.2 Addresses in an MSCS Configuration

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

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

Types of Addresses

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

Physical IP Addresses Assigned to Network Adapters

An MSCS configuration usually has two networks:

- A public network that is used for the communication between the central instance, application servers and the LAN.

- A private network that is used internally for communication between the nodes of the cluster.

2.1   Installation Planning for MSCS

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.

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

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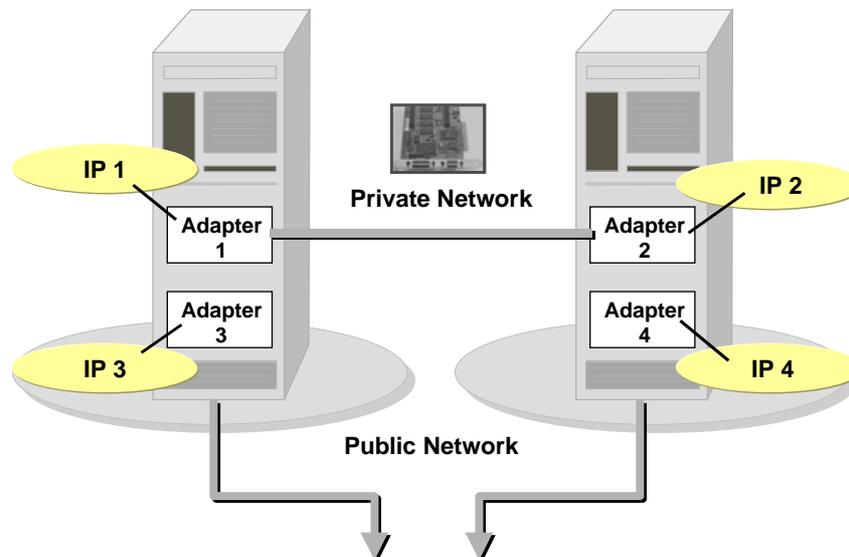
Host Names Assigned to Network Adapters

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

IP Addresses and Host Names

Network Adapter	IP Address	Host Name
Adapter 1 (private network)	10.1.1.1	`decc14_priv`
Adapter 3 (public network)	129.20.5.1	`decc14`

> Make sure that you are aware of the following:
>
> - The SAP cluster setup might fail due to blank or special characters in the network connection name for the private or public network. Therefore, we recommend you to rename *Adapter 1* and *Adapter 3* to *Private* and *Public* network.
>
>   For more information, see **SAP Note 413553**.
>
> - Note that the IP address and host name of the **public** network adapter is also the IP address and name of the machine. In the above example, this

means that the machine that is the node on the left has the name
`decc14`.

- 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* (for Oracle it is also displayed in the node column of the
  > *Fail Safe Manager*). 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.

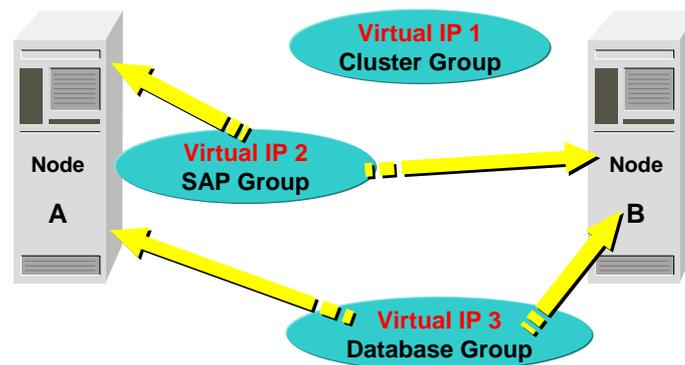## Virtual IP Addresses Assigned to Cluster Groups

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 address as before.

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

2.1.2.1 ⚇ Obtaining Addresses for MSCS

Use

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

Prerequisites

- If you are installing Windows for the first time on your system, follow the procedure "Obtaining IP Addresses" below.

- If Windows has already been installed on your system, the host names and IP addresses of the network adapters (cards) have already been defined and exist in your system.

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

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

Procedure

Obtaining IP Addresses

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

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

⚠️

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

Physical IP Addresses

Component	Example for Physical IP Address	Example for Physical Host Name	Purpose	Defined During
Node A: adapter for private network	10.1.1.1	decc14_priv	Address for inter-node communication on the private network	Windows installation
Node A: adapter for public network	129.20.5.1	decc14	Address of node A for communication with application servers and LAN (this is the same as the address of node A)	Windows installation
Node B: adapter for	10.1.1.2	decc15_priv	Address for inter-node	Windows installation

private network			communication on the private network	
Node B: adapter for public network	`129.20.5.2`	`decc15`	Address of node B for communication with application servers and LAN (this is the same as the address of node B)	Windows installation

Virtual IP Addresses

Component	Example for Virtual IP Address	Example for Name (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
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 for the cluster using SAPinst on node A
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 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.

For more information about addresses in the cluster environment, see Using Addresses in an MSCS Configuration [Page 135].

2.1.3 Checking Hardware Requirements for MSCS

Use

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 achieve an acceptable performance level.

Procedure

1. Check that your cluster hardware is certified.

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

```
www.microsoft.com/hcl
```

```
www.saponwin.com
```

2. Make sure that both nodes of the cluster are connected by a private and public network:

   o The public network enables communication from the nodes of the cluster to other resources in the local area network (LAN).

   o The private network enables internal communication between the nodes. In particular, it enables the *Cluster Service* running on both nodes to regularly exchange messages on the state of the nodes so that the failure of resources is quickly detected.

3. Check that sufficient storage space is available.

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

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

Disks	Required Space	How to Check
1 local disk on each node	4 GB	1. Choose Start → Programs → Administrative Tools → Computer Management → Disk Management. 4. Right-click the disk and choose Properties.
At least 6 shared disks	25 GB	1. Choose *Start* → Programs → *Administrative Tools* → *Computer Management* → *Disk Management*. 5. Right-click the disk and choose *Properties*.

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

4.   Check the RAM and virtual memory on each node:

Requirement	How to Check
• RAM for a non-Unicode SAP system: 512 MB RAM for a Unicode SAP system: 1 GB	In the *Windows Explorer* choose *Help* → *About Windows*.
Paging file size of 5 times RAM. Maximum required is 10 GB.	1. Right-click *My Computer* and choose *Properties*. 5. Choose *Advanced* → *Performance Options*. 6. If required, in section *Virtual Memory*, choose *Change*. Only select the local disks.

2.1.4   Checking Software Requirements for MSCS

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	• To check the Windows Version: a. Choose Start → Programs → Accessories → Command Prompt b. Enter the command

2.1   Installation Planning for MSCS

• Windows 2000 Advanced Server with at least service pack 4 • Windows 2000 Datacenter Server with at least service pack 4 For any version of Windows 2000, you need at least service pack 4. For more information on the latest service pack supported by SAP, see **SAP Note 30478**.	`winver`
MSCS software	–
Oracle Enterprise Edition 9.2.0 with the current patch.	For more information on the current patch set, see **SAP Note 578683**. MSCS only: You have to install the Oracle patch set and hot fix (if available) on both nodes.
Oracle Fail Safe software version 3.3.2	–
Suitable Windows Resource Kit is strongly recommended.	–

2.2 ⛓ Installation Preparations for MSCS

Purpose

Before you install the central instance and database of the SAP system, you need to prepare the system for cluster installation.

Prerequisites

Make sure that you have finished the installation planning [Page 132], especially the:

- Hardware requirements [Page 140]
- Software requirements [Page 141]

Process Flow

The following table lists all the preparatory tasks you need to perform before beginning with the installation of the SAP system.

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

1. On **both nodes**, you install the operating system [Page 141] with the option *Cluster Service*. For more information, see the Windows documentation.

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

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

2. On **both nodes,** you manually assign drive letters to the shared disks [Page 143] using the *Windows Disk Administrator.* Both nodes must access the shared disks with the same drive letters.

3. On **both nodes**, you adjust the size of the paging file and the file cache. For more information, see Hardware and Software Requirements [Page 47] and Reducing the Size of the File Cache [Page 57]

4. You map the seven IP addresses to host names [Page 144] on the Domain Name Server (DNS) or in the `hosts` file.

5. You check the IP address and corresponding host name assignment. For more information, see Checking the Mapping of Host Names for MSCS [Page 145].

6. On **both nodes**, you check the binding order. For more information, see Checking the Mapping of Host Names for MSCS [Page 145].

2.2.1 ⮛ Assigning Drive Letters for MSCS

Use

We recommend that you assign drive letters for MSCS.

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

Procedure

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

2. Select a disk and choose *Action → All tasks → Change drive.*

3. Enter a new drive letter.

2.2.2 Mapping Host Names to IP Addresses for MSCS

Use

To enable correct operation of the failover mechanism, you have to map all IP addresses in the cluster to host names. You can do this on a Domain Name Server (DNS) or in the Windows hosts file.

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 with the information stored on a DNS Server or in the hosts file.

Prerequisites

*   You have the list of addresses [Page 137].

*   You have installed Windows.

*   Enter **all** seven IP addresses required for the cluster configuration.

    > Take care when making your entries because missing or incorrect entries can cause problems later during the installation:
    >
    > *   The names are case-sensitive.
    >
    > *   You need to enter the names exactly as specified by the system administrator.

*   You can perform the mapping either on the DNS server or in the hosts file.

    > 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 several versions of the same file because each machine in the system has its own hosts file.

Procedure

*   On the DNS Server

    If your system includes a DNS server, map the host names to IP addresses on this server.

*   In the hosts file

If you do not have a DNS server in your system infrastructure, map the IP addresses to host names in the `hosts` file. This is located in the default directory for Windows:

`<%SystemRoot%Drive>\system32\drivers\etc`

The `hosts` file has to be identical on both nodes of the cluster, and on all application servers and front ends. Therefore, you have to copy the newly edited file to all these locations in the system.

2.2.3 Checking the Mapping of Host Names for MSCS

Use

You need to check the mapping of host names to IP addresses [Page 144] because this is crucial for cluster operation.

> Make sure that you perform this procedure; otherwise you might have serious problems later.

Prerequisites

- You have mapped IP addresses to host names on the DNS Server or in the `hosts` file.

- Make sure that you check **all** IP addresses.

Procedure

1. For each IP address enter the following commands:

   `ping -a <IP_Address>`

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

   `ping hostname`

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

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

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

   o If uppercase and lowercase are incorrect in the output, there is an error. Make sure that you correct the error before proceeding with the installation.

   o 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, see the procedure below.

3. If you discover an error in the network bindings, correct it by doing the following on **both** nodes:

a. Choose Start   Settings   Network and Dial-up Connections

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

c. Choose Advanced   Advanced Settings → Adapters and Bindings

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

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

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

g. Repeat this step for any other TCP/IP protocols that are listed.

2.3 ⬛ Central and Database Instance Installation for MSCS

Purpose

When you have completed the preparation for the cluster installation, you can start the installation of the central and database instances for your SAP system.

Prerequisites

- You have completed the Installation Preparations for MSCS [Page 143].

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

Process Flow

You perform the following steps to install the SAP central and database instance. You are logged on as domain administrator, unless otherwise specified.

⚠️

> When you reboot during the installation process [Page 148], resources fail over to the second node. Therefore, after each reboot, you have to return the system to the state it had before the reboot.

1. In the *Cluster Administrator*, you move all *Disk groups* and the *Cluster group* to node A*. For more information, see Moving MSCS Groups [Page 148].

   On both nodes, you install the Oracle 9.2.0 server software and the current patch set (if available) [Page 71].

2. On **both nodes**, you install the Oracle Fail Safe Software 3.3.2 [Page 149] After the installation you reboot [Page 148].

   ⚠️

   > Do **not** install the Fail Safe Software **parallely** on both nodes.

3. On node A, in the *Cluster Administrator*, make sure that all existing cluster groups are online. Make sure that you are logged on as a user with domain administration rights

4. On node A, you run SAPinst [Page 73] to install the SAP central instance and the database instance.

   Note the following:

   o Make sure that you are logged on as domain administrator.

   o When you are prompted to enter the name for the saptranshost or the database, accept or enter the physical host name of node A

   See also:
   Distribution of Components to Disks for MSCS [Page 132]

Result

You have installed the central and database instances on the cluster hardware. However, they cannot yet use the cluster functionality.

In the next stage – the conversion to MSCS [Page 153] – you configure the database and SAP system to use the cluster functionality.

2.3.1 Rebooting During the Installation or Conversion for MSCS

Use

You 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 the second node. Therefore, after each reboot, you have to return the system to the state it had before the reboot, as described below.

Procedure

1. In the *Cluster Administrator*, move all resources back to the original node.

2. Start the database service, especially *OracleService<DBSID>,* if it already exists.

3. If you have **already** clustered the database, you have to bring the database group online.

4. Recreate the SAPMNT and SAPLOC shares for the directory usr\sap.

   > ⚠️
   >
   > If you use Windows Server 2003, you have to reset the permissions for the SAPMNT and SAPLOC shares from *Read* to *Full Control*, as follows:
   >
   >   i.   Right-click on the directory usr\sap and choose *Sharing and Security*.
   >
   >   ii. Select *Sharing* and in the *Share Name* field, enter SAPMNT.
   >
   >   iii. Under *Permissions*, make sure that the permission for SAPMNT is set to *Full Control*.
   >
   >   iv. Repeat this procedure for the SAPLOC share.

2.3.2 Moving MSCS Groups

Use

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

Prerequisites

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

Procedure

1. Start the Cluster Administrator with *Start → Programs → Administrative Tools → Cluster Administrator*.

2. In the Cluster Administrator, select a group – for example Disk Group 1 – and drag it to the required node on the left-hand pane.

3. Repeat the previous step for each group that you want to move.

2.3.3 Installing the Oracle Fail Safe Software

Use

To enable the database to take advantage of the cluster functionality, you have to install an additional component, the Oracle Fail Safe software.

> The Oracle Failsafe 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`.

Prerequisites

You have installed the Oracle database software locally on both nodes. It must be installed on the same home on both nodes!

Procedure

> You have to install the Oracle Fail Safe Software on both nodes:

The installation procedure differs depending on whether you install the Oracle Fail Safe software in a 32-bit or a 64-bit system. The following describes both approaches.

Installing the Oracle Fail Safe Software in a 32-Bit System

1. In the *Cluster Administrator* make sure that:

   o The second cluster node is not set to *Pause.*

   o The SAP group is offline on the node where you are installing.

2. Make sure that the Cluster Server service is started on both nodes.

3. Insert the Oracle RDBMS DVD for 32-bit.

4. Start the *Oracle Universal Installer*. To do this, double-click the file `sapofs.cmd` in the directory `<DVD_DRIVE>:\ORAFS332I386`

The *Installer* opens and guides you through the installation process in a series of screens. Enter the required information as follows:

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 `OFS`. 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`
Available Products	Select *Oracle Fail Safe <current version>* and 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 Services for MSCS 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 logon account for the service is displayed. Enter this account for *Oracle Fail Safe Account/Password.*
End of Installation	Click *Exit* to leave the *Installer.*

5. Reboot and log on again.

⚠️

> Do not reboot a node, if the installation of OFS 3.3.2 is in progress on the other node.

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.

1. In the *Cluster Administrator* make sure that:

o   The second cluster node is not set to *Pause.*

o   The SAP group is offline on the node where you are installing.

2.   Make sure that the *Cluster Server* service is started on both nodes.

3.   Insert the Oracle RDBMS DVD for **64 bit** to install the Oracle Fail Safe Server
Software.

4.   Start the *Oracle Universal Installer* by double-clicking the file `sapofs.cmd` in the
directory `<DVD_DRIVE>:\ORAFS332`.

5.   Enter the required information as follows:

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 Services for MSCS 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.*

Screen	Entry
End of Installation	Click *Exit* to leave the *Installer.*

6. Insert the Oracle RDBMS DVD for **32-bit** to install the Oracle Fail Safe Client Software.

7. Start the *Oracle Universal Installer* by double-clicking the file `sapofs.cmd` in the directory `<DVD_DRIVE>:\ORAFS332I386`

8. Enter the required information as follows:

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 `OFSCLI`. 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\CLI**
Available Products	Select *Oracle Fail Safe 3.3.2.0.0* 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	Click *Exit* to leave the *Installer.*

9. Reboot and log on again.

⚠️

Do not reboot a node, if the installation of OFS 3.3.2 is in progress on the other node.

2.4 ⛃ The Conversion to MSCS

Purpose

The conversion phase of the cluster installation configures the database and the SAP instances to interact with the cluster software and use the failover functionality.

Prerequisites

- You have completed the installation of the SAP central and database instance, and observed all instructions for a cluster.

- You have installed the Oracle Fail Safe software on both nodes.

    ⚠

    Before you start the conversion to MSCS, make sure that you are logged on as domain administrator on node A and B.

Process Flow

💡

When you reboot during the conversion to MSCS [Page 148], resources fail over to the second node. Therefore, after each reboot, you have to return the system to the state it had before the reboot.

1. On node A, make sure that the Oracle database group and SAP disk are online.

2. Configure node A for MSCS [Page 153] with SAPinst [Page 73] using the option *Configure MSCS Node A.*

3. On node A, convert the Oracle database to a Fail Safe database. For more information, see Converting the DB to a Fail Safe Database [Page 154].

4. Check that the database group and SAP cluster group are available on node A. In the SAP cluster group, the SAP resource `SAP-R/3 <SAPSID>` must be offline. All other resources of the SAP cluster group must be online.

5. Configure MSCS Node B [Page 156] with SAPinst [Page 73], using the option *Configure MSCS Node B.*,

2.4.1 ▽ Configuring Node A for MSCS

Use

To configure node A so that it functions properly in the cluster, 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

- Copies the Oracle `tnsnames.ora` file to node B and adds the account under which the Cluster Service runs to the group `ORACLE_<SAPSID>_DBA`

Procedure

1. Make sure that you are logged on to node A as a user with domain administration rights and as the **same user** that installed the central and database instance.

2. Run SAPinst [Page 73] and choose *Configure MSCS Node A.*

   If SAPinst prompts you to log off from your system, log off and log on again.

3. Enter the required parameter values. For more information, see Input for Configuring MSCS Node A and Node B [Page 157].

Result

SAPinst converts the SAP instance on node A for cluster operation.

2.4.2 Converting the Database to a Fail Safe Database

Use

The database must be cluster-enabled so that it can be switched between nodes as a group of resources. To do this, you create an Oracle Fail Safe group and then add the database of the SAP system to this group.

Prerequisites

You have converted node A for operation in the cluster [Page 153].

Procedure

When you set up the Fail Safe database, you have to convert the database to a Fail Safe group and then add the database of the SAP system to this group.

Creating the Oracle Fail Safe Group

On node A, create the *Fail Safe* database group as follows:

1. Choose *Start → Programs → Oracle - <OFSClient_Home> → Oracle Fail Safe Manager.*

   The window *Add Cluster To Tree* appears.

2. Insert your virtual cluster name.

3. Right-click the cluster and choose *Connect to cluster*.

4. 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>**

5.   In the *Welcome* dialog box, choose *Verify Cluster*.

Both 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.

6.   In the *Oracle Fail Safe Manager*, create the *Fail Safe* group ORACLE<SAPSID>.

Choose *Groups* → *Create*.

The window *Create Group:...* appears.

7.   Enter the *Group Name* **ORACLE<SAPSID>**.
     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.*

8.   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.

9.   Select *Show networks accessible by clients* and enter the following information:

Under *Network* leave the entry **public**

Under *Virtual Address* for *Host Name* enter **<database_group_name>** (the virtual name for the database group).

The *IP Address* is automatically recognized.

Choose *Finish.*

The window *Add the Virtual Address to the Fail Group* appears. Choose *OK.*

If the *Fail Safe Manager* cannot create the *Fail Safe* group, look at the *Windows Event Logs* on both nodes to find out the reason for the failure.

Adding the Database of the SAP System to the Fail Safe Group

Perform the following steps in the Fail Safe Manager on the primary node A:

1.   In the tree on the left, expand *<Primary_Node>* → *Standalone Resources* and then select the database <SAPSID>.world.

2.   Choose *Resources* → *Add to Group.*

3.   On the dialog box *Add Resource to Group – Resources:*

For *Resource Type,* select *Oracle Database.*

For *Group name*, select *Oracle<SAPSID>*

4.   On the dialog box *Add Resource to Group – Database Identity,* enter the following:

Service Name	<SAPSID>.world

Instance Name	`<SAPSID>`
Database Name	`<SAPSID>`
Parameter File	`<DRIVE>:\<ORACLE_HOME>\database\init<SAPSID>.ora`

> If a warning appears about the location of `init<sapsid>.ora`, you can ignore it.

5.   When you have made all entries, choose *Next*.

6.   On the dialog box *Confirm Add Database to Group* choose *Yes* to shutdown the database.

7.   For each 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.

The SAP database `<SAPSID>` is now added to the Fail Safe group.

2.4.3 Configuring Node B for MSCS

Use

To configure the second node in the cluster, you have to run the cluster configuration option for node B offered by the SAPinst tool. When you run this option it:

- Creates users and groups
- Sets the Windows system and user environment
- Copies tools to the `SAPCluster` directory
- Enters required port numbers in the Windows services file
- Creates the `SAPService` and `SAPOsCol` Services

Prerequisites

You have already configured node A of the cluster [Page 153]. Node A is the primary cluster node.

Procedure

1.   Make sure that you are logged on to node B as a user with domain administration rights and as the **same user** that installed the SAP central and database instance.

2.   Run SAPinst [Page 73] and choose *Configure MSCS Node B*.

> If SAPinst prompts you to log off from your system, log off and log on again.

3.   Enter the required parameter values. For more information, see Input for Configuring MSCS Node A and B [Page 157].

When all required entries have been made, SAPinst begins processing and converts the SAP instance on node B for operation in the cluster.

4.   When SAPinst has finished, start the SAP resource `SAP-R/3 <SAPSID>`:

      a. Open the *Cluster Administrator* with *Start → Programs → Administration Tools → Cluster Administrator*.

      b. Expand the SAP group.

      c. Select the SAP resource.

      d. Choose *File → Bring Online.*

2.4.4 Input for Configuring MSCS Node A and B

Window	Prompt	Meaning

Welcome	*Select the service to install*	Choose *SAP R3E 4.7x200 SR1 → ABAP System → <Unicode or non-Unicode>* and choose one of the following:
		
		• Node A:
		  Choose *Configure MSCS Node A*
		
		• Node B:
		  Choose *Configure MSCS Node B.*

SAPinst CD Browser > Checking Software Packages:	*CD Name* *Package Location* *Check Location* *Copy Package To*	This dialog only appears if the system wants to check or cannot find the file `LABEL.ASC` that contains the relevant installation information. For more information on the CD Browser dialog, see [Preparing the Installation CDs and DVDs [Page 66].](#) Under *Package Location*, enter the path to the directory where the file `LABEL.ASC` is located. • To find the correct location of the installation package, look in the file `README.TXT` located in the root directory of the relevant CD or DVD. • When SAPinst prompts for a folder `<FOLDER_NAME>` on a CD or DVD, make sure that you enter the path to the corresponding directory on this CD or DVD (`<CD_or_DVD>\`

Window	Prompt	Meaning
		`<FOLDER_NAME>` `)`.
MSCS > Selecting Cluster Parameter	*SAP System Network Name,* *Database Network Name*	• Enter the SAP system network name (virtual host name of the **SAP cluster group**). • Enter the database network name (virtual host name of the **database cluster group**).
MSCS > Specifying the SAP System Common Parameters	*SAP System Instance Identification:*	• *SAP System ID (SAPSID)* Enter the SAP system `<SAPSID>` ID for your cluster. Use the same `<SAPSID>` ID that you entered during the central instance installation. • *Instance number* Enter exactly the instance number that you have entered during the central instance installation. To find out the instance number, look under the SAP directory `usr\sap\<SAPSID>\DVEBMGS<nn>`. The value `<nn>` is the number assigned to the central instance
MSCS > SAP System Common Parameters	*Database Parameters :* *Database ID (DBSID)*	Enter the database system ID.
MSCS > Specifying the SAP Instance Host Parameters	*Instance Memory Management:* *Instance RAM* [MB]	Enter the RAM space that is reserved for the SAP instance. The default value is the entire RAM space. Make sure that you reserve at least the minimum values required for your instance.
	Domain Information for the SAP System Accounts	Choose one of the following • Installation in the domain of the current user • Installation in a different domain

Window	Prompt	Meaning
ABAP System > Defining the LDAP Parameters (Node A)	*LDAP Support*	If you want to use LDAP for SAP Logon or the Microsoft Management Console (MMC), choose the type of LDAP integration you want to configure for the SAP system. Otherwise, choose *No LDAP*: • *Via Active Directory Service* 　Select this option to integrate Windows Active Directory services. An Active Directory must be available on the network. 　(Profile parameter `ldap/options=DirType=NT5ADS`) • *Via Generic LDAP Directory* 　Select this option to configure the system to support LDAP directories that are running on Windows or UNIX machines. A generic LDAP directory must be available on the network. • *No LDAP* 　Select this option if you do not want to use LDAP for SAP Logon and/or MMC or if you do not want to use LDAP at all. Required Input Depending on your selection the information below is required. If you choose *No LDAP*, none of the LDAP parameters listed below has to be specified.
	Management Domain	Specifies a container in the Active Directory where information related to the new SAP system is to be stored. Use the distinguished name syntax. The name of the container (management domain) can reflect the organizational structure of your company. For example, if the system is for corporate finance and located in Walldorf, the name can be: `CN=Finance, CN=Walldorf.` Profile parameter: `ldap/saprdn` You need not specify this. However in a large system landscape, we recommend setting this parameter to reflect the structure of multiple SAP installations.

2.4 The Conversion to MSCS

Window	Prompt	Meaning
	Container for all SAP-related entries	Specifies the SAP root container in the LDAP directory under which all future information related to SAP systems is to be stored. Use the distinguished name syntax that specifies both the name of the container and the path to reach it. Profile parameter: `ldap/saproot` • *Via Active Directory Service:* We do not recommend setting this parameter. If you do no set this parameter, the system automatically calculates the default value to store information in the configuration context for Active Directory Service (ADS). • *Via Generic LDAP Directory* You must specify this parameter.
	LDAP Server	Enter the DNS host name of the server on which the LDAP directory is running. If the directory is replicated on other servers in the network, specify these as well. For example: `ldapsrv1 ldapsrv2.` Profile parameter: `ldap/servers.` Note that the replica must be writeable. • *Via Active Directory Service:* We do not recommend setting this parameter. If you do not set this parameter, the system automatically finds the best ADS Server. • *Via Generic LDAP Directory* You must specify one or more LDAP servers, separated by blanks.
ABAP System > Defining the Location of the SAP System Instance Directories	*Location of SAP System Executables*	• *Yes, locate executables on central instance host* This option is the default value, if you use a 64-bit Windows system. Select this option, also in a 32-bit system, if you install your SAP system in a mixed environment. For example, you install it on Windows and UNIX, or in a 32-bit and 64-bit system operating system. • *No preparation for other OS platforms* This option is the default value in a 32-bit system. Choose this option if you use a 32-bit system.

Window	Prompt	Meaning
	Instance Installation Drive	Select the drive for the SAP base directory tree. For example, if you select D:, the directory `usr\sap` is located under drive D. If *saploc* already exists, you cannot select the local drive.
	Host with transport directory	Enter the name of the host where the transport directory is located. If the transport directory is located in the cluster you have to enter the virtual host name of the SAP system.
Oracle > Selecting the Database System Common Parameters (Node A)	*Database Instance Parameters :* *Database Schema*	Enter the name of the database schema (`SAP<SCHEMA_ID>`, whereas `<SCHEMA_ID>` must be exactly three characters long). For example, enter `SAPDS1`.
	Database Home Inforation : *DB Home*	Enter the name of the Oracle home.
ABAP System > Specifying Password for User	*OS User Parameters:* *SAP System Administrator*	Enter and confirm the password for the `<sapsid>adm` user. Enter and confirm the same password that you used for the central instance.
ABAP System > Specifying Password for User	*OS User Parameters: SAP System Service Administrator*	Enter and confirm the password for the `SAPService<SAPSID>` user. Enter and confirm the same password that you used for the central instance.

2.4   The Conversion to MSCS

Window	Prompt	Meaning
ABAP System > Defining SAP System Service Ports (Node B)	*SAP System Ports:* *Message Port*	Enter the port number of the Message Server. ![lightbulb icon] The port number of the Message Port must be the same as the one on the central instance host.
ABAP System > Registering in System Landscape Directory (SLD)	*Use SLD*	If you want to use the SAP System Landscape Directory, select *Use SLD.*
	SLD Gateway Host	Enter the name of the gateway host of the SAP System Landscape Directory. To find out the host name, enter `hostname` at the command prompt of the gateway host.
	SLD Gateway Instance Number	Enter the instance number of the gateway instance of the SAP System Landscape Directory

2.5 Post-Installation Activities for MSCS

Purpose

This section describes how to complete and check the installation of the SAP MSCS system.

Prerequisites

You have completed the installation steps explained in previous sections of this documentation and you have installed at least one SAP front end.

For more information on installing the front-end software, see the documentation [Page 35]:

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

Process Flow

1. You start and stop the SAP system [Page 163].

2. You log on to the SAP system [Page 93].

   When you create the logon entry, make sure that you enter the **virtual host name** in the *Application Server* field.

3. You install the SAP license [Page 94].

4. On **both nodes**, you check SAP system services [Page 94].

5. You install the online documentation [Page 95].

6. You configure SAProuter and SAPNet - R/3 Frontend [Page 96].

7. You configure the Transport Management System (TMS) [Page 96].

8. You perform basic operations [Page 97].

9. You check and, if required, adapt the configured number of work processes [Page 97].

10. If required, you install additional languages [Page 98].

11. You activate or deactivate the integrated Internet Transaction Server (ITS) [Page 98].

12. If required, you import Support Packages [Page 99].

13. If required, you set up Secure Single Sign-On [Page 98] or Kerberos Single Sign-On [Page 104].

14. You perform the client copy [Page 109].

15. You perform a full installation backup [Page 111].

16. Prepare the SAP system for using business applications, which includes customizing the SAP R/3 Enterprise and the business components.

    For more information, choose *Solution Life Cycle Management → Customizing* in the SAP Library [Page 36].

17. You change passwords of created users [Page 112].

2.5.1 🔻 Starting and Stopping the SAP System in an MSCS Configuration

Use

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

Procedure

Starting the System

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

2.   Right-click the SAP group *SAP-R/3 <SAPSID>* and choose *Bring online.*

   The SAP system is started.

Stopping the System

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

2.   Double-click the group *SAP-R/3 <SAPSID>* to display the resources belonging to the SAP group.

3.   Right-click the resource *SAP-R/3 <SAPSID>* and *choose Take offline.*

   The SAP system is stopped.