Installation Guide

Installation Guide – SAP NetWeaver Composition Environment 7.1 SP3 on AIX: MaxDB

Productive Edition

Target Audience

- Technology consultants
- System administrators

Document version: 1.0 – 11/05/2007
Document History

⚠️ Caution

Before you start the implementation, make sure you have the latest version of this document. You can find the latest version at the following location: [http://www.sdn.sap.com](http://www.sdn.sap.com) SAP NetWeaver Composition Environment.

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

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<th>Version</th>
<th>Date</th>
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</tr>
</thead>
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<tr>
<td>1.0</td>
<td>11/5/2007</td>
<td>Initial Version</td>
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1 Introduction

This document explains how to install an SAP NetWeaver Composition Environment system as productive edition.
For more information about SAP NetWeaver Composition Environment, see SAP Community Network at [http://sdn.sap.com](http://sdn.sap.com) » SAP NetWeaver » Composition Environment.

1.1 New Features

Here you can find the new features in this release.

⚠️ Caution
Make sure that you read the release notes for your SAP system. You can find these on SAP Service Marketplace at [http://service.sap.com/releasenotes](http://service.sap.com/releasenotes).

SAP System Installation

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
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<tbody>
<tr>
<td>SAPinst</td>
<td>SAPinst has the following new features:</td>
</tr>
<tr>
<td></td>
<td>• The technical terms used for the instances of an SAP system have changed as follows:</td>
</tr>
</tbody>
</table>
| |   • “Central instance” (CI) is now called “primary application server instance”.
| |   • “Dialog instance” (DI) is now called “additional application server instance”.
<p>| | Note |
| | The technical terms “Database instance”, “Java central services instance” (SCS), and “ABAP central services instance” (ASCS) remain unchanged. |
| | • “Central system” – meaning an SAP system running on one single host – is now called “standard system”. |
| | Only valid for: HA (UNIX) |
| | • You can now install the enqueue replication server (ERS) with SAPinst. There is a new installation option Enqueue Replication Server Instance available for the installation options Distributed System and High-Availability System. |
| | End of: HA (UNIX) |
| | • You can now install the host agent separately with SAPinst. There is a new installation option Host Agent available under Software Life-Cycle Options » Additional Preparations. |
| | The host agent contains all of the required elements for centrally monitoring any host with the Alert Monitor or the SAP NetWeaver Administrator. It is |</p>
<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
</tr>
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| automatically installed during the installation of all SAP NetWeaver components, except TREX. You only need to install the host agent separately in the following cases:  
- You want to centrally monitor a host that does not have an SAP component.  
- You want to perform an upgrade to SAP NetWeaver.  
- The locations of all installation DVDs can be entered on one screen. |
| Software Deployment Manager (SDM) no longer available in the Application Server Java | The Software Deployment Manager (SDM) is no longer part of the primary application server instance of a Java-only system. Therefore, there is no longer any technical difference between the primary application server instance and the additional application server instance of a Java-only system. The SAP system directory of both instances is now called J<instance_number>. J<instance_number> no longer exists. For more information, see SAP Directories [page 59]. |
| Usage type EP Core (EPC) | The usage type Enterprise Portal (EP) is divided into the usage types EP Core (EPC) and Enterprise Portal (EP):  
- **EP Core (EPC)**  
  This usage type contains the core portal capabilities that were available in the former usage type EP. This new usage type provides more flexibility when implementing a portal where the full enterprise portal capabilities, such as knowledge management and collaboration, are not required. It contains the portal, GP, and UWL.  
- **Enterprise Portal (EP)**  
  This usage type includes Knowledge management, Collaboration, CAF-Core, Visual Composer, Web Dynpro extension, and .NET PDK. Usage type EPC is a prerequisite for usage type EP. If you want to obtain the full capabilities of the former usage type EP, you need both EP Core and EP. The configuration of EPC comprises only portal configuration steps.  

**Note**  
The standalone implementation of the new usage type EPC without usage type EP is currently limited to certain ERP scenarios, as described in the mySAP ERP Master Guide. |
| Installation DVDs | You start the installation from the Installation Master DVD for your database. |
| SAP JVM | You no longer have to download and install a Java Development Kit (JDK) or Java Runtime Environment (JRE) from another software vendor. SAP delivers its own Java Virtual Machine (JVM) called SAP JVM. This virtual machine is certified and fully compliant with the J2SE 5.0 standard, offering a strong and reliable foundation for the whole SAP Java stack. SAP JVM is available on the Installation Master DVD. SAPInst extracts and installs it automatically when you start the installation. |
| Visual Administrator tool integrated in SAP NetWeaver Administrator | SAP NetWeaver Administrator is a brand new solution for monitoring and administering Java systems and their applications. It is a web-based tool for administration, configuration, and monitoring. The Visual Administrator tool is no longer available as a separate tool. It has been integrated in the SAP NetWeaver Administrator. SAP NetWeaver Administrator offers you most of the functions previously available in Visual Administrator, but redesigned for the task-oriented approach of SAP NetWeaver Administrator. |
### 1.2 SAP Notes for the Installation

You **must** read the following SAP Notes **before** you start the installation. These SAP Notes contain the most recent information on the installation, as well as corrections to the installation documentation. Make sure that you have the up-to-date version of each SAP Note which you can find in the SAP Service Marketplace at [http://service.sap.com/notes](http://service.sap.com/notes).

**SAP Notes for the Installation**

<table>
<thead>
<tr>
<th>SAP Note Number</th>
<th>Title</th>
<th>Description</th>
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<tr>
<td>966416</td>
<td>SAP NetWeaver Installation Based on Kernel 7.10: UNIX</td>
<td>UNIX-specific information about the installation for SAP systems based on kernel 7.10 and corrections to this documentation.</td>
</tr>
<tr>
<td>73606</td>
<td>Supported Languages and Code Pages</td>
<td>Information on possible languages and language combinations in SAP systems</td>
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</table>
1.3 Information Available on SAP Service Marketplace

More information is available as follows on SAP Service Marketplace.

### Documentation

<table>
<thead>
<tr>
<th>Description</th>
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<th>Title</th>
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<tr>
<td>Solution Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solution Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Optimizer</td>
<td><a href="http://service.sap.com/solutionmanager">http://service.sap.com/solutionmanager</a></td>
<td>All corrective software packages, including Support Packages (Stacks) for SAP NetWeaver 7.0 (2004s) and subsequent versions, as well as all applications which are based on this software (including SAP Business Suite 2005), released after April 2, 2007, will be available exclusively through</td>
</tr>
</tbody>
</table>
1.4 Naming Conventions

In this documentation, the following naming conventions apply:

**Terminology**

- *SAP system* refers to *SAP NetWeaver CE 7.1*.

**Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;SAPSID&gt;</td>
<td>SAP system ID in uppercase letters</td>
</tr>
<tr>
<td>&lt;sapsid&gt;</td>
<td>SAP system ID in lowercase letters</td>
</tr>
<tr>
<td>&lt;sid&gt; and &lt;sapsid&gt;</td>
<td>SAP system ID in lowercase letters</td>
</tr>
<tr>
<td>&lt;DBSID&gt;</td>
<td>Database ID in uppercase letters</td>
</tr>
</tbody>
</table>

### General Quick Links

<table>
<thead>
<tr>
<th>Description</th>
<th>Internet Address</th>
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<tbody>
<tr>
<td>SAP Notes</td>
<td><a href="http://service.sap.com/notes">http://service.sap.com/notes</a></td>
</tr>
<tr>
<td>Released platforms and operating systems</td>
<td><a href="http://service.sap.com/platforms">http://service.sap.com/platforms</a></td>
</tr>
<tr>
<td>System sizing (Quick Sizer tool)</td>
<td><a href="http://service.sap.com/sizing">http://service.sap.com/sizing</a></td>
</tr>
<tr>
<td>High availability</td>
<td><a href="http://service.sap.com/ha">http://service.sap.com/ha</a></td>
</tr>
<tr>
<td>SAP Solution Manager</td>
<td><a href="http://service.sap.com/solutionmanager">http://service.sap.com/solutionmanager</a></td>
</tr>
<tr>
<td>SAP GUI Family</td>
<td><a href="http://service.sap.com/sapgui">http://service.sap.com/sapgui</a></td>
</tr>
</tbody>
</table>
### Variables and Description

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;dbsid&gt;</td>
<td>Database ID in lowercase letters</td>
</tr>
<tr>
<td>&lt;host_name&gt;</td>
<td>Name of the corresponding host</td>
</tr>
<tr>
<td>&lt;user_home&gt;</td>
<td>Home directory of the user performing the installation.</td>
</tr>
<tr>
<td>&lt;INSTDIR&gt;</td>
<td>Installation directory for the SAP system</td>
</tr>
<tr>
<td>&lt;DVD_DIR&gt;</td>
<td>Directory on which a DVD is mounted</td>
</tr>
<tr>
<td>&lt;OS&gt;</td>
<td>Operating system name within a path</td>
</tr>
<tr>
<td>&lt;SCHEMADID&gt;</td>
<td>Database schema ID</td>
</tr>
</tbody>
</table>

The following example shows how the variables are used:

**Example**

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

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

This section provides general planning information.

You must first:

1. Plan your SAP system landscape according to the Master Guide and the Technical Infrastructure Guide available for your product.
2. Decide on your installation option [page 13].

Now continue with the section for your chosen installation option below.

Standard, Distributed, or High-Availability System

1. You plan your system configuration [page 23].
2. If you want to use Adobe Document Services (ADS), you check what you have to do in case your platform is not supported for ADS [page 24].
3. You decide whether you want to install multiple components in one database (MCOD) [page 25]

   Only valid for: HA (UNIX)

4. If you want to install a high-availability system, you read Planning the Switchover Cluster [page 26].

End of: HA (UNIX)

5. You can now continue with Preparation [page 31].

Additional Application Server Instance

You do not have to perform any planning steps.

You can immediately continue with Preparation [page 31].

Host Agent as a Separate Installation

You do not have to perform any planning steps.

You can immediately continue with Preparation [page 31].

2.1 Installation Options Covered by this Guide

This section shows the installation options covered by this installation guide. In the SAPinst tool, these comprises installation and software life-cycle options.

- Standard system [page 14] (formerly known as central system)
- Distributed system [page 14]
Planning

2.1 Installation Options Covered by this Guide

- High-availability system [page 15]
- You can install one to <n> additional application server instance(s) [page 16] to an existing standard, distributed or high-availability system.
- You can install a standalone host agent [page 19].

2.1.1 Standard System

You can install a standard system on a single host. In a standard system, all main instances run on a single host:

- Central services instance (SCS)
- Database instance (DB)
- Primary application server instance

**Figure 1:** Standard Java System

![Figure 1: Standard Java System](image.png)

 Optionally you can install one to <n> additional application server instances. For more information, see Additional Application Server Instance [page 16].

2.1.2 Distributed System

In a distributed system, every instance can run on a separate host:
2 Planning

2.1 Installation Options Covered by this Guide

- Central services instance (SCS)
- Database instance (DB)
- Primary application server instance

Note
You can also use the SAP transport host or the SAP global host as your primary application server instance host.

Optionally you can install one to \(<n>\) additional application server instances. For more information, see Installation of an Additional Application Server Instance [page 16].

Figure 2: Distributed Java System

2.1.3 High-Availability System

In a high-availability system, every instance can run on a separate host:
- Java Central Services Instance (SCS)
- Database instance (DB)
- Primary application server instance (PAS)
We recommend that you run both the ASCS and the SCS in a switchover cluster infrastructure. Both the ASCS and the SCS must each have their own Enqueue Replication Server (ERS) instance. Optionally you can install one to \(<n>\) additional application server instances. For more information, see Installation of an Additional Application Server Instance [page 16].

The following figures show examples for the distribution of the SAP instances in a high-availability system.

**Figure 3:** High-Availability System

---

**2.1.4 Additional Application Server Instance**

You can install one to \(<n>\) additional application server instance(s) for an existing SAP system. An additional application server instance can run on:

- The host of any instance of the existing SAP system (exceptions see below)
- On a dedicated host

**Additional Application Server Instance for a Standard System**

For example, the following figure shows each of the three additional application server instances that are running:
2 Planning
2.1 Installation Options Covered by this Guide

- On the main host of the SAP system, that is on the host on which the primary application server instance and the database instance run
- On dedicated hosts

**Figure 4:** Additional Application Server Instance for a Standard System

For additional information, see *Standard System* [page 14].

**Additional Application Server Instance for a Distributed System**

For example, the following figure shows each of the three additional application server instances that are running:

- On the main host of the SAP system, that is on the host on which the primary application server instance and the database instance run
- On dedicated hosts

It is not recommended to install additional application server instance(s) on the SAP global host.
Figure 5: Additional Application Server Instance for a Distributed System

For additional information, see Distributed System [page 14].

Only valid for: HA (UNIX)

Additional Application Server Instance for a High-Availability System

For example, the following figure shows each of the three additional application server instances that are running on:

- The host of the primary application server instance
- Dedicated hosts

It is not recommended to install additional application server instance(s) on the switchover cluster infrastructure.
2.1 Installation Options Covered by this Guide

Figure 6: Additional Application Server Instance for a High-Availability System

For more information, see High-Availability System [page 15].

End of: HA (UNIX)

2.1.5 Standalone Host Agent

Using the host agent you can centrally monitor any host with the Alert Monitor or the SAP NetWeaver Administrator. It is automatically installed during the installation of all SAP NetWeaver components.

You only need to install a standalone host agent in the following cases:

- You want to centrally monitor a host that does not have an SAP component.
- You want to perform an upgrade to SAP NetWeaver.
2.2 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 lets you distribute components to disks in the system as required.
How you do this significantly affects system throughput and data security, so you need to plan it carefully.
The best distribution depends on your environment and must reflect 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. On the basis of sample configurations and the recommendations provided in this documentation, you can then choose the best setup for your particular system.
SAP systems are normally installed on RAID arrays to guarantee data redundancy. Therefore, this documentation focuses on RAID subsystems and drives.

**Features**
The following graphic shows how you can distribute the main directories created during the installation to Redundant Arrays of Independent Disks (RAID). The distribution is suitable for an average-sized production system. Keep in mind that this is only an example and that no single solution fits all environments.

**Figure 8:** Directory Distribution for RAID

This configuration is suitable for the main host of a central system or the database server of a standalone database system. You can assign the components on the left to any of the arrays shown. You do not necessarily have to place the transport directory on the central instance host.
This setup has the following key features:

- **Security of the Logs**
  The security of the logs is crucial. The logs record all the changes made to the database and so provide the information that is necessary to recover a damaged database. Therefore, it is important that they are stored very securely and are never lost at the same time as the database data. By placing the redo logs on a different array to the database data, you can make sure that they are not lost if the array with the database data is severely damaged.

- **Performance**
  You can reduce I/O bottlenecks by placing the original logical log on a different array than the mirrored log. Original and mirrored logs are written in parallel. If they are located on the same array, this results in a high level of write activity that has to be handled by the same controller. By separating original and mirrored logs, you can distribute the write activity to two different arrays, so reducing I/O bottlenecks.

- **RAID**
  By using RAID 1 arrays for the original and mirrored logs, you get high data security and good performance. The data is written to a primary disk and duplicated identically to a second disk. If one disk fails, the data is still intact on the second disk.
  The use of RAID 5 for the database ensures fault tolerance. The data is striped over all the disks in the array together with parity information. If one disk fails, the parity information is used to automatically reconstruct the data lost on the damaged disk.

- **Number of RAID Arrays**
  In the example above, three RAID 1 arrays are used for the redo logs to achieve optimal performance and security. If you do not need the disk capacity offered by three arrays and can accept reduced performance, consider using a single array. In this case, you can use a single RAID 1 array for the original and mirrored logs.
2.3 MaxDB System Configuration

Security Issues

- For security reasons the logs must be mirrored using the operating system or hardware.

  ☢️ **Caution**
  
  If a system runs without mirroring, you might lose all data since the last complete backup in the event of a disk crash.

  🔄 **Recommendation**
  
  We recommend mirroring the logs using the operating system or hardware.
  If this is not possible, then mirror the logs with the database mirroring provided by MaxDB.

- We recommend you to run the database with raw devices.

  ☢️ **Caution**
  
  Never use RAID 5 systems for database log volumes.

- Do not replace file systems by softlinks.
- Raw devices are very secure in the event of a system crash.

Security Concept for Database Software Owner

As of MaxDB 7.5.00 there is a new security concept for the database software owner. Authorization to access directories and files is restricted, and a new user and user group is required:

- User is **sdb** (MaxDB default)
- User group is **sdba** (MaxDB default)

This user and group are the only database software owners on the host. For security reasons, the user does not have a logon for the system, which guarantees the physical integrity of the database files. Database processes run under this user, which makes sure that several different users cannot manipulate the database system.

Performance Issues

- Store database data files and logs on different disks
- As the logs are written synchronously, they produce the most I/O activity of all database files.
- It is possible to put the logs on the same disk as **/sapmnt**, but this is not recommended.
- Use the partitions **DISKD<N>** exclusively for data files of the database.
- If paging or swapping areas and log data reside on the same disk, the performance will be extremely poor.
- For database volumes, raw devices are faster than files. The slowest disk drive determines the I/O performance of the database.
Different MaxDB Systems
For performance reasons, we normally recommend that you do not install several database systems (for different SAP systems) on one single host. If you still decide to do so, you must install each database as described in this documentation.

Recommended Configuration
The following graphic shows an optimal distribution of the database data on different disks.

Optimal Distribution

Figure 9:

For more information on the file systems for the SAP system and the MaxDB database, see Setting Up File Systems and Raw Devices [page 59].

2.4 Running Adobe Document Services on Non-Supported Platforms

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

You can install multiple SAP systems in a single database. This is called Multiple Components in One Database (MCOD).
MCOD is available with all SAP components. We are releasing this technology on all the major databases for the SAP system, in line with our commitment to deliver platform-independent solutions.

Using this technology is as easy as installing a separate component. No extra effort is required because the MCOD installation is fully integrated into the standard installation procedure. MCOD is not an additional installation option. Instead, it is an option of the database instance installation.

With MCOD we distinguish two scenarios:
- The installation of an SAP system in a new database
- The installation of an additional SAP system in an existing database

Prerequisites

- For more information on MCOD and its availability on different platforms, see the SAP Service Marketplace at http://service.sap.com/mcod.
- Since SAP does not support mixed solutions with MCOD, your SAP system must contain Unicode SAP instances only.
- Improved sizing required
  In general, you calculate the CPU usage for an MCOD database by adding up the CPU usage for each individual SAP system. The same applies to memory resources and disk space.
  You can size multiple components in one database by sizing each individual component using the SAP Quick Sizer and then adding the requirements together. For more information on the SAP Quick Sizer, see the SAP Service Marketplace at http://service.sap.com/sizing.

Features

- Reduced administration effort
- Consistent system landscape for backup, system copy, administration, and recovery
- Increased security and reduced database failure for multiple SAP systems due to monitoring and administration of only one database
- Independent upgrade
  In an MCOD landscape you can upgrade a single component independently from the other components running in the same database, assuming that the upgraded component runs on
the same database version. However, if you need to restore a backup, be aware that all other components are also affected.

**Note**

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

**Constraints**

- **We strongly recommend** that you test MCOD in a test or development system. We recommend that you run MCOD systems in the same context. We do not recommend that you mix test, development, and production systems in the same MCOD.
- In the event of database failure, all SAP systems running on the single database are affected.
- Automated support in an MCOD landscape for the following administrative tasks depends on your operating system and database:
  - Copying a single component from an MCOD landscape to another database at database level.
  - De-installing a single component from an MCOD landscape requires some additional steps. You can use a remote connection to SAP support to request help with these tasks. For more information see [http://service.sap.com/remoteconnection](http://service.sap.com/remoteconnection).
- When you use `stopsap` in an MCOD system with two primary application server instances, only one primary application server instance is stopped. Therefore, you must first stop the other SAP system with `stopsap R3` to make sure that the database is also stopped.
- **You cannot** install a Unicode SAP system with a non-Unicode SAP system in one database.
- For the first SAP system, the database system ID can be different from the SAP system ID.
- For the second SAP system, you must use the same DBSID as for the first SAP system.
- If you decide to turn off database logging during the database load phase of the installation, you need to plan downtime for all MCOD systems sharing the database.

**2.6 Planning the Switchover Cluster**

You can reduce unplanned downtime for your SAP system by setting up a switchover cluster. This setup installs critical software units – known as “single points of failure” (SPOFs) – across multiple host machines in the cluster. In the event of a failure on the primary node, proprietary switchover software automatically switches the failed software unit to another hardware node in the cluster. Manual intervention is not required. Applications accessing the failed software unit normally experience a short delay but can then resume processing as normal.

Switchover clusters also have the advantage that you can deliberately initiate switchover to free up a particular node for planned system maintenance. Switchover solutions can protect against hardware failure and operating system failure but **not** against human error, such as operator errors or
faulty application software. Additional downtime might be caused by upgrading your SAP system or applying patches to it. Without a switchover cluster, the SAP system SPOFs — central services instance, the database instance, and the central file share — are vulnerable to failure because they cannot be replicated. All of these can only exist once in a normal SAP system. You can protect software units that are not SPOFs against failure by making them redundant, which means simply installing multiple instances. For example, you can add additional application server instances. This complements the switchover solution and is an essential part of building HA into your SAP system.

**Recommendation**
SAP recommends switchover clusters to improve the availability of your SAP system.

A switchover cluster consists of:

- A hardware cluster of two or more physically separate host machines to run multiple copies of the critical software units, in an SAP system the SPOFs referred to above
- Switchover software to detect failure in a node and switch the affected software unit to the standby node, where it can continue operating
- A mechanism to enable application software to seamlessly continue working with the switched software unit — normally this is achieved by virtual addressing (although identity switchover is also possible)

**Prerequisites**
You must first discuss switchover clusters with your hardware partner because this is a complex technical area. In particular, you need to choose a proprietary switchover product that works with your operating system.

We recommend that you read the following documentation before you start:

- **SAP High Availability at:**
- **Technical Infrastructure Guide at:**
  - [http://service.sap.com/instguidesNW](http://service.sap.com/instguidesNW)
- The enqueue replication server (ERS) is a major contribution to an HA setup and is essential for a Java system. We strongly recommend you to also use it for an ABAP system. You need one ERS for each Java SCS and one ERS for each ABAP SCS (ASCS) installed in your system.

**Features**
The following graphic shows the essential features of a switchover setup:
Note

This graphic and the graphics in this section are only examples. You need to discuss your individual HA setup with your HA partner.

These graphics summarize the overall setup and do not show the exact constellation for an installation based on one of the available technologies (ABAP, ABAP+Java, or Java).

The following graphic shows an example of a switchover cluster in more detail:
2 Planning
2.6 Planning the Switchover Cluster

Figure 11: Switchover Cluster

Constraints
This documentation concentrates on the switchover solution for the central services instance. For more information on how to protect the Network File System (NFS) software and the database instance by using switchover software or (for of the database) replicated database servers, contact your HA partner.

You need to make sure that your hardware is powerful enough and your configuration is robust enough to handle the increased workload after a switchover. Some reduction in performance might be acceptable after an emergency. However, it is not acceptable if the system comes to a standstill because it is overloaded after switchover.

More Information
For more information on HA documentation, see:
http://service.sap.com/ha

End of: HA (UNIX)
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3 Preparation

This section includes the preparation steps that you have to perform for the:

- Standard, distributed or high-availability system
- Additional application server instance
- Host agent as a separate installation

Preparation Steps for a Standard, Distributed, or High-Availability System

Note

In a standard system, all mandatory instances are installed on one host. Therefore, if you are installing a standard system, you can ignore references to other hosts.

1. You identify basic SAP system parameters [page 32].
2. You check the hardware and software requirements [page 38] for every installation host of the HA system landscape that you want to install.
3. You make sure that the required operating system users and groups [page 53] are created.
4. If you want to configure the User Management Engine (UME) of Application Server Java (AS Java) for the user management of a separate ABAP system, you have to prepare user management for an external ABAP System [page 56].
5. You set up file systems and raw devices [page 59] and make sure that the required disk space is available for the directories that will be created by SAPinst.
6. If you want to share the transport directory trans from another system, export [page 68] this directory to your installation hosts.

Only valid for: HA (UNIX)

7. If you want to install a high-availability system, you perform switchover preparations [page 52].

End of: HA (UNIX)

Only valid for: HA (UNIX)

8. If you want to install a high-availability system, you set up the virtual host name and specify this when you set the environment variable SAPINST_USE_HOSTNAME [page 79]. Alternatively you can specify the virtual host name in the command to start SAPinst.

End of: HA (UNIX)

9. You generate the SAP Solution Manager Key [page 71].
10. You make sure that the required installation media [page 72] are available on every host on which you want to install an instance of your SAP system.
11. You can continue with Installation [page 75].

**Preparation Steps for an Additional Application Server Instance**

You have to perform the following preparations on the host where you install the additional application server instance(s):

1. You identify basic SAP system parameters [page 32].
2. You check the hardware and software requirements [page 38] for every installation host on which you want to install one or more additional application server instances.
3. You make sure that the required operating system users and groups [page 53] are created.
4. You set up file systems and raw devices [page 59] and make sure that the required disk space is available for the directories that will be created by SAPinst.
5. If you want to share the transport directory trans from another system, export [page 68] this directory to your installation hosts.
6. You make sure that the required installation media [page 72] are available on every host on which you want to install one or more additional application server instances.
7. You can continue with Installation [page 75].

**Preparation Steps for the Host Agent as a Separate Installation**

You have to perform the following preparations on the host where you install the host agent separately:

1. You identify basic SAP system parameters [page 32].
   You find the parameters in the table Host Agent.
2. You check the hardware and software requirements [page 38] on the installation host.
   You find the requirements for the Host Agent in section Requirements for the Host Agent (Standalone).
3. You make sure that the required operating system users and groups [page 53] are created.
   You find the operating system user for the Host Agent in the table Operating System User for the Host Agent.
4. You set up file systems and raw devices [page 59] and make sure that the required disk space is available for the directories that will be created by SAPinst.
   You find the directories for the Host Agent in section Host Agent Directories
5. You make sure that the required installation media [page 72] are available on the installation host.
   You find the installation media that are required for the Host Agent in the table Host Agent (Standalone)
6. You can continue with Installation [page 75].

**3.1 Basic SAP System Parameters**

SAPinst asks whether you want to run the installation in Typical or Custom mode.
If you choose *Typical*, SAPinst provides automatic default settings and you only have to respond to a minimum number of prompts. However, you can still change any of the default settings on the parameter summary screen.

The tables below list the basic system parameters that you always need to specify before installing your SAP system, both in typical and in custom mode.

For all other SAP system parameters, use the `F1` help in the SAPinst dialogs.

### SAP System ID and Database ID

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP System ID &lt;SAPSID&gt;</td>
<td>The SAP system ID &lt;SAPSID&gt; identifies the entire SAP system. SAPinst prompts you for the &lt;SAPSID&gt; when you execute the first installation option to install a new SAP system. If there are further installation options to be executed, SAPinst prompts you for the profile directory. For more information, see the description of the parameter SAP System Profile Directory.</td>
</tr>
<tr>
<td></td>
<td><strong>Example</strong></td>
</tr>
<tr>
<td></td>
<td>This prompt appears when you install the central services instance, which is the first instance to be installed in a distributed system.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>Choose your SAP system ID carefully. Renaming is difficult and requires you to reinstall the SAP system.</td>
</tr>
<tr>
<td></td>
<td>Make sure that your SAP system ID:</td>
</tr>
<tr>
<td></td>
<td>▪ Is unique throughout your organization</td>
</tr>
<tr>
<td></td>
<td>▪ Consists of exactly three alphanumeric characters</td>
</tr>
<tr>
<td></td>
<td>▪ Contains only uppercase letters</td>
</tr>
<tr>
<td></td>
<td>▪ Has a letter for the first character</td>
</tr>
<tr>
<td></td>
<td>▪ Does not include any of the following, which are reserved IDs:</td>
</tr>
<tr>
<td></td>
<td>ADD ALL AND ANY ASC COM CON DBA END EPS FOR GID IBM INT KEY LOG MON NIX NOT NUL OFF OMS RAW ROW SAP SET SGA SHG SID SQL SYS TMP UID USR VAR</td>
</tr>
<tr>
<td>Database ID &lt;DBSID&gt;</td>
<td>The &lt;DBSID&gt; identifies the database instance. SAPinst prompts you for the &lt;DBSID&gt; when you are installing the database instance. The &lt;DBSID&gt; can be the same as the &lt;SAPSID&gt;.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>Choose your database ID carefully. Renaming is difficult and requires you to reinstall the SAP system.</td>
</tr>
<tr>
<td></td>
<td><strong>If you want to install a new database:</strong></td>
</tr>
<tr>
<td></td>
<td>Make sure that your database ID:</td>
</tr>
<tr>
<td></td>
<td>▪ Is unique throughout your organization</td>
</tr>
<tr>
<td></td>
<td>▪ Consists of exactly three alphanumeric characters</td>
</tr>
<tr>
<td></td>
<td>▪ Contains only uppercase letters</td>
</tr>
</tbody>
</table>
### 3.1 Basic SAP System Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
</table>
|            | - Has a letter for the first character  
|            | - Does not include any of the following, which are reserved IDs:  
|            | ADD ALL AND ANY ASC COM CON DBA END EPS FOR GID IBM INT KEY LOG  
|            | MON NIX NOT NUL OFF OMS RAW ROW SAP SET SGA SHG SID SQL SYS TMP  
|            | UID USR VAR  
|            | - **If you want to use an existing database system:**  
|            | Enter exactly the database ID of the existing database to which you want to add the system. |

### SAP System Profile Directory

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
</table>
| /<sapmnt>/<SAPSID>/profile or /usr.sap/<SAPSID>/SYS/profile | The installation retrieves the parameters entered earlier from the SAP system profile directory. SAPInst prompts you to enter the location of the profile directory when the installation option that you execute is not the first one belonging to your SAP system installation. See also the description of the parameters **SAP System ID** and **Database ID**. 
| /usr.sap/<SAPSID>/SYS/profile | is the soft link referring to /<sapmnt>/<SAPSID>/profile.  
|                          |  
|                         | **Note**  
|                         | If you install an additional application server instance to an existing SAP system, SAPInst also prompts you for the profile directory of the existing SAP system. |

### SAP System Instances, Hosts, and Ports

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
</table>
| Instance Number | **Instance Number:**  
| | Technical identifier that is required for every instance of an SAP system, consisting of a two-digit number from 00 to 97.  
| | The instance number must be unique on a host. That is, if more than one SAP instance is running on the same host, these instances must be assigned different numbers.  
| | To find out this number, look in the SAP directory /usr.sap/<SAPSID>/J<nn> on the host of the primary application server instance.  
| | The value <nn> is the number assigned to the primary application server instance. |
3.1 Basic SAP System Parameters

### Parameters: Virtual Host Name

For a high-availability (HA) system where you want to install the SCS instance into a cluster, you need to specify the virtual host name [page 70] before you start SAPinst.

- For more information about the use of virtual TCP/IP host names, see SAP Note [962955](#).
- For more information about the allowed host name length and characters, see SAP Note [611361](#).

To find out the host name, open a command prompt and enter `hostname`.

### Parameters: Message Server Port

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The message server port number must be unique for the SAP system on all hosts. If there are several message ports number on one host, all must be unique.</td>
</tr>
</tbody>
</table>

**Port Number of the SAP Message Server:**

If you do not specify a value, the default port number is used.

The Java message server is configured in the SCS instance profile.

The Java message server port uses the parameter `rdisp/msserv_internal` with default value `39<nn>`, where `<nn>` is the instance number of the SCS message server instance.

For more information about the parameters used for message server ports, see SAP Note [821875](#).

### Parameters: Master Password

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>This password is used for all new user accounts SAPinst creates and for the secure store key phrase. The length has to be 8 to 14 characters. Depending on your installation scenario there might be more restrictions.</td>
</tr>
</tbody>
</table>

**Caution**

If you do not create the operating system users manually, SAPinst creates them with the common master password. For more information, see the description of the parameter Operating System Users. In this case, make sure that the master password meets the requirements of your operating system and of your database.

### Parameters: Operating System Users of the SAP System

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User <code>&lt;sapsid&gt;adm</code> is the system administrator user. If you did not create user <code>&lt;sapsid&gt;adm</code> manually before the installation, SAPinst creates it automatically during the installation. SAPinst sets the Master Password by default, but you can overwrite it either by choosing parameter mode Custom or by changing it on the parameter summary screen. Make sure that the user ID and group ID of this operating system user are unique and the same on each application server instance host.</td>
</tr>
</tbody>
</table>
### 3.1 Basic SAP System Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User sapadm</td>
<td>User <code>sapadm</code> is used for central monitoring services. If you did not create user <code>sapadm</code> manually before the installation, SAPinst creates it automatically during the installation. SAPinst sets the Master Password by default, but you can overwrite it either by choosing parameter mode <code>Custom</code> or by changing it on the parameter summary screen. Make sure that the user ID and group ID of <code>sapadm</code> are unique and the same on each application server instance host. For more information, see Creating Operating System Users [page 53].</td>
</tr>
</tbody>
</table>

### User Management Engine (UME)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| UME Configuration | SAPinst prompts you for how to configure the UME during the input phase of the installation. You can choose between the following options:  
  - Use Java database (default).  
    - If you choose this option, administrators can manage users and groups with the UME Web admin tool and SAP NetWeaver Administrator only.  
  - Use an external ABAP system.  
    - If you choose this option, administrators can manage users with the transaction SU01 on the external ABAP system, and, depending on the permissions of the communication user, also with the UME Web admin tool and SAP NetWeaver Administrator.  
    - You must have created the required users manually on the external ABAP system.  
    - For more information, see Preparing User Management for an External ABAP System [page 56]. |

### Using the Java Database:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java Administrator User</td>
<td>SAPinst sets the user name <code>Administrator</code> and the master password by default. If required, you can choose another user name and password according to your requirements.</td>
</tr>
<tr>
<td>Java Guest User</td>
<td>SAPinst sets the user name <code>Guest</code> and the master password by default. The <code>Guest</code> user is for employees who do not belong to a company or who have registered as company users with pending approval. Guest users belong to the default group <code>Authenticated Users</code> and have read access only.</td>
</tr>
</tbody>
</table>

### Using an External ABAP System – Parameters for the ABAP Connection:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server Instance Number</td>
<td>This is the instance number on the application server of the central ABAP system to which you want to connect the Application Server Java. To find out the number on the host of the primary application server instance, look under the SAP directory <code>usr/sap/&lt;SAPSID&gt;/DVEBMGS&lt;nn&gt;</code>. The value <code>&lt;nn&gt;</code> is the number assigned to the SAP system.</td>
</tr>
</tbody>
</table>
### 3.1 Basic SAP System Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server Host</td>
<td>This is the host name of the relevant application server instance. To find out the host name, enter <code>hostname</code> at the command prompt of the host running the primary application server instance.</td>
</tr>
<tr>
<td>Communication User</td>
<td>This is the name and password of the existing ABAP communication user. You must have created this user manually on the external ABAP system.</td>
</tr>
</tbody>
</table>

**Using an External ABAP System – Parameters for the Application Server Java Connection:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator User</td>
<td>This is the name and password of the administrator user that you created on the external ABAP system.</td>
</tr>
<tr>
<td>Administrator Role</td>
<td>The role <code>SAP_J2EE_ADMIN</code> must exist on the external ABAP system.</td>
</tr>
<tr>
<td>Guest User</td>
<td>This is the name and password of the guest user that you created on the external ABAP system. The guest user is for employees who do not belong to a company or who have registered as company users with pending approval. Guest users belong to the default group <code>Authenticated Users</code> and have read access only.</td>
</tr>
<tr>
<td>Guest Role</td>
<td>The role <code>SAP_J2EE_GUEST</code> must exist on the external ABAP system.</td>
</tr>
</tbody>
</table>

#### Internet Communication Manager (ICM) User Management

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password of <code>webadm</code></td>
<td>The administration user <code>webadm</code> is created to use the web administration interface for Internet Communication Manager (ICM) and Web Dispatcher. <code>SAPinst</code> sets the master password by default. If required, you can choose another password. The length of the password must be between 5 and 128 characters.</td>
</tr>
</tbody>
</table>

#### Host Agent as a Separate Installation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password of <code>sapadm</code></td>
<td>The administration user <code>sapadm</code> is created to use central monitoring services. If this user is not already existing, it is created automatically by <code>SAPinst</code>. <code>SAPinst</code> prompts you to enter either the password of the existing user or a new password for the user to be created.</td>
</tr>
</tbody>
</table>

#### Solution Manager Key

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Solution Manager key</td>
<td>To install your SAP system, you need to generate a SAP Solution Manager key <a href="#">page 71</a>, which the installation requires to continue. For more information, see <a href="https://www.sap.com">SAP Note 805390</a>.</td>
</tr>
</tbody>
</table>
**3.2 Hardware and Software Requirements**

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

- The values that are checked by the Prerequisite Checker apply to the installation of development systems or quality assurance systems.
- For the most recent updates to the Prerequisite Checker, always check SAP Note 855498.

You can run the Prerequisite Checker as follows:

- **Standalone (optional):**
  To check the hardware and software requirements of the host on which you want to later install an SAP system, you can run the Prerequisite Checker standalone [page 40].

- **Integrated in SAPinst (mandatory):**
  SAPinst automatically runs the Prerequisite Checker when you install your SAP system.

**Recommendation**

We also recommend that you consult the requirements checklists tables, which also provide values for the installation of development systems or quality assurance systems. Depending on the amount of data involved, the requirements might change.

In addition, consider the following information:

- To get precise sizing values for production systems, you choose one of the following options:
  - You use the SAP Quick Sizer tool that is available on SAP Service Marketplace at [http://service.sap.com/sizing](http://service.sap.com/sizing). You enter information about your planned system and the tool calculates the requirements. For more information, see Planning your System Landscape in the Master Guide for your SAP system, which is available on SAP Service Marketplace [page 10].
  - You contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing depending on:
    ◆ The set of applications to be deployed
    ◆ How intensively the applications are to be used
    ◆ The number of users

- For supported operating system releases, see the Product Availability Matrix on SAP Service Marketplace at [http://service.sap.com/pam](http://service.sap.com/pam).

- Contact your OS vendor for the latest OS patches.

- Make sure that the host name meets the requirements listed in SAP Note 611361.

- Check your keyboard definitions.

- If you want to install a printer on a host other than the host of the primary application server instance (for example, on a separate database instance host), make sure that the printer can be accessed under UNIX.
3.2  Hardware and Software Requirements

**Process Flow**

1. If required, you run the Prerequisite Checker standalone [page 40] to check the hardware and software requirements.

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

2. In addition, we recommend that you check the hardware and software requirements for your operating system and for the system variant that you want to install:

   - AIX [page 41]
   - Standard system [page 43]

   ➥ **Note**

   These requirements also apply if you want to install the Application Sharing Server as an Optional Standalone Unit.

   - Distributed system [page 44]
   - High availability system [page 47]
   - If you want to install additional application server instances, check the requirements for an additional application server instance [page 50].
   - If you want to install the Application Sharing Server as an Optional Standalone Unit, see the requirements for a standard system [page 43].
   - If you want to install the host agent on a host that does not have an SAP component, check the requirements for the host agent as a separate installation [page 51].

**3.2.1 Running the Prerequisite Checker in Standalone Mode (Optional)**

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

➤ **Recommendation**

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

➤ **Note**

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

- You have prepared the Installation Master DVD on the required installation host [page 72].
- You make sure that the required prerequisites are met before starting SAPinst [page 79].

**Procedure**

1. You start SAPinst [page 79].
2. On the Welcome screen, choose  -  <SAP System> -  Software Life-Cycle Options -  Additional Preparation Tasks -  Prerequisites Check.
3. Follow the instructions in the SAPinst dialogs and enter the required parameters.

**Note**

For more information about each parameter, position the cursor on the parameter field and choose [F1] in SAPinst.

When you have finished, the Parameter Summary screen appears summarizing all parameters you have entered. If you want to make a change, select the relevant parameters and choose Revise.

4. To start the Prerequisite Checker, choose Start.

**Result**

The Prerequisite Check Results screen displays the results found. If required, you can also check the results in file prerequisite_checker_results.html, which you can find in the installation directory.

### 3.2.2 Requirements for AIX

You use the following information to check that the host machine meets the requirements listed in the table below:

**Note**

The information here is not intended to replace the documentation of the AIX operating system.

You can perform AIX-specific steps as follows:

- Manually by entering AIX commands with the appropriate options
- Using System Management Interface Tool (SMIT), a menu-driven system administration tool

If you have problems with the function keys, you can also use [ESC] and the corresponding number to simulate the function key (for example, [F4] is equivalent to [ESC] and 4).
Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape drive</td>
<td>High-capacity tape drive with hardware compression is recommended. You can test the drive /dev/rmt0 with this command: tar -cvf /dev/&lt;tape_device&gt; &lt;test_file&gt; The device name is always rmt0 unless more than one tape drive exists</td>
</tr>
</tbody>
</table>
| DVD drive                        | ■ ISO 9660 compatible  
■ You can configure multiple CD / DVD drives, but you cannot mount all of them. For more information, see *Mounting a CD / DVD for AIX* [page 120]. |  |
| Required disks                   | For data security reasons, distribution over three disks is required. We recommend you to distribute over five disks.  
To display available disks enter this command:  
lspv  
Disks marked none in the 3rd column are unused.  
To display free space on a disk enter this command:  
lspv -p <disk_name>  
Areas marked from in the 2nd column are unused.  
If an advanced disk array is available (for example, RAID), contact your hardware vendor to make sure that the data security requirements are covered by this technology. |
| RAM                              | To display RAM size in KB enter the following command:  
lsattr -El sys0 -a realmem                                      |
| Swap Space                       | 3 to 4 * RAM, at least 20 GB                                                                                     |
| CPU                              | The recommended minimum hardware is either two physical single core processors or one physical dual core processor. |

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| C++ runtime level                  | Check the C++ runtime level with the following commands:  
■ #lslpp -L x1C.aix50.rte  
The output must be at least 8.0.0.5.  
■ #lslpp -L x1C.rte  
The output must be at least 8.0.0.5. |
| Operating system version           | Check the operating system version with this command:  
lslpp -1 bos.rte  
The output must include the following or a larger version number:  
bos.rte 5.2.0.75 |
| AIX Maintenance Level (ML) and Technology Level (TL) | AIX Maintenance Level (ML) and Technology Level (TL)  
■ AIX 5.2: The output of the command oslevel -r should be at least 5200-03 (ML 3).  
■ AIX 5.3: The output of the command oslevel -s should be at least 5300-05-01 (TL 5 SP 1). |
### 3.2.3 Requirements for a Standard System

If you want to install a standard system — that is, all instances reside on one host — the host must meet the following requirements:

- **LDAP (Lightweight Directory Access Protocol)**
  - If you want to use LDAP, you require the following LDAP library:
    
    ```
    libldap.a
    ```

- **Additional software**
  - Make sure that the following additional file sets are installed:
    - `bos.adt` Base Application Development
    - `bos.perf` — performance and diagnostics tools
    - `perfagent.tools` — performance monitoring tools
    - `bos.perf.libperfstat` — Performance Statistics Library
  - For an overview of the installed file sets, enter the following command:
    ```
    lspp -L | more
    ```
  - Install the necessary local code set by adding an additional language environment as follows:
    1. Start the System Management Interface Tool (SMIT) with the following command:
       ```
       smitty mle_add_lang
       ```
    2. Select the following:
       ```
       Cultural Conventions to install:
       IS08859-1 German (Germany) [de_DE]
       ```
       ```
       Language Translation to install:
       IS08859-1 German [de_DE]
       ```
    - This step installs the required `bos.1oc` and `bos.1conv` file sets.
    3. Additionally, check that all file sets are in a consistent state with this command:
       ```
       lppchk -v
       ```

- **Printer**
  - Check whether a file can be printed with this command:
    ```
    lp -d<printer_name> <test_file>
    ```
  - Check the status of your spool and the printers with this command:
    ```
    lpsstat -t
    ```

- **Keyboard**
  - You can set the keyboard by typing this command on the directly connected console:
    ```
    smitty chkbd
    ```
  - You can select your keyboard under Motif by setting a language environment (LANG), for which a National Language Support (NLS) component is installed. The settings take effect after reboot.

- **Network**
  - Test the network connection to the database server with this command:
    ```
    /etc/ping <db_server_name> 100 10
    ```
3.2 Hardware and Software Requirements

Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk space</td>
<td>- Hard disk drives with sufficient space for the SAP system and the database</td>
</tr>
<tr>
<td></td>
<td>For more information, see <em>SAP Directory</em> [page 59].</td>
</tr>
<tr>
<td></td>
<td>- For more information about the disk space requirements for MaxDB, see</td>
</tr>
<tr>
<td></td>
<td><em>Requirements for the Database Instance</em> [page 45].</td>
</tr>
<tr>
<td></td>
<td>- 4.3 GB of temporary disk space for every required installation DVD that</td>
</tr>
<tr>
<td></td>
<td>you have to copy to a local hard disk. For more information, see *Preparing the</td>
</tr>
<tr>
<td></td>
<td>Installation DVDs* [page 72].</td>
</tr>
<tr>
<td></td>
<td>- 1.2 GB of temporary disk space for the installation.</td>
</tr>
<tr>
<td>RAM</td>
<td>3 GB (minimum), 7.5 GB (recommended)</td>
</tr>
<tr>
<td>Swap Space</td>
<td>Hard disk drives with sufficient space for swap: 3 to 4 * RAM, at least 20 GB</td>
</tr>
</tbody>
</table>

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>If application servers are installed decentralized, Network File System (NFS) must</td>
</tr>
<tr>
<td></td>
<td>be installed.</td>
</tr>
<tr>
<td>Fonts and code pages</td>
<td>Make sure that the required fonts and code pages are installed.</td>
</tr>
<tr>
<td>National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding saplocales</td>
</tr>
<tr>
<td></td>
<td>are installed.</td>
</tr>
</tbody>
</table>

3.2.4 Requirements for a Distributed System

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

- *Central services instance* [page 44]
- *Database instance* [page 45]
- *Primary application server instance* [page 46]

Note

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

3.2.4.1 Requirements for a Central Services Instance

The central services instance host must meet the following requirements for the central services instance:
3.2.4.2 Requirements for the Database Instance

The database host must meet the following requirements:

Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Disk space      | - Space requirements of the SAP data file systems, see the following file: `<Export_DVD>/DATA_UNITS/EXPORT_1/DB/ADA/DBSIZE.XML`
                 | The XML table in this file contains a field called *fDevSize*, which contains the size in MB of the element indicated in the previous field, *fDevName*. This shows you the size of the data (*DBDATADEV*) and the log (*DBLOGDEV*) volumes. |

**Note**

The values listed in `DBSIZE.XML` are only for guidance.

For more information about the required disk space per file system, see Setting Up File Systems [page 59].

For security reasons (system failure), the file systems must be distributed physically over at least three (but five are recommended) disks.

- Database software:
  - Version 7.6: 500 MB
  - Version 7.7: 700 MB
- 4.5 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk.
### 3.2 Hardware and Software Requirements

#### 3.2.4.3 Requirements for the Primary Application Server Instance

The host where the primary application server instance runs must meet the following requirements:

##### Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Hard disk space  | Hard disk drives with sufficient space for the central instance.  
For more information, see SAP Directories [page 59].  
4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. For more information, see Preparing the Installation DVDs [page 72].  
1.2 GB of temporary disk space for the installation. |
| RAM              | 1.0 GB (minimum), 3 GB (recommended) |
| Swap Space       | Hard disk drives with sufficient space for swap: 3 to 4 * RAM, at least |

##### Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>If application servers are installed decentralized, Network File System (NFS) must be installed.</td>
</tr>
<tr>
<td>Required fonts and code pages</td>
<td>Make sure that the required fonts and code pages are installed.</td>
</tr>
<tr>
<td>National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding saplocales are installed.</td>
</tr>
</tbody>
</table>
| Operating systems              | For supported operating system releases, see SAP Service Marketplace at [http://service.sap.com/platforms](http://service.sap.com/platforms) Product Availability Matrix 44.  
Contact your operating system vendor for the latest OS patches. |
3.2 Hardware and Software Requirements

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>If application servers are installed decentralized, Network File System (NFS) must be installed.</td>
</tr>
<tr>
<td>Required fonts and code pages</td>
<td>Make sure that the required fonts and code pages are installed.</td>
</tr>
<tr>
<td>National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding saplocales are installed.</td>
</tr>
</tbody>
</table>

3.2.5 Requirements for a High Availability System

The following sections provide information about the hardware and software requirements for a high availability system, where the following SAP instances can reside on different hosts or on a switchover cluster infrastructure:

- Enqueue replication server instances [page 48]
- Database instance [page 49]
- Primary application server instance [page 50]

3.2.5.1 Requirements for a Central Services Instance

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

Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk space</td>
<td>- Hard disk drives with sufficient space for the central services instance</td>
</tr>
<tr>
<td></td>
<td>For more information, see SAP Directories [page 59].</td>
</tr>
<tr>
<td></td>
<td>4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. For more information, see Preparing the Installation DVDs [page 72].</td>
</tr>
<tr>
<td></td>
<td>1.2 GB of temporary disk space for the installation.</td>
</tr>
<tr>
<td>RAM</td>
<td>0.5 GB (minimum), 1 GB (recommended)</td>
</tr>
<tr>
<td>Swap Space</td>
<td>Hard disk drives with sufficient space for swap: 3 to 4 * RAM, at least 20 GB</td>
</tr>
</tbody>
</table>
Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>Network File System (NFS) must be installed.</td>
</tr>
</tbody>
</table>

**3.2.5.2 Requirements for an Enqueue Replication Server Instance**

The host on which an enqueue replication server instance runs must meet the following requirements:

*Note*

The enqueue replication server instance is only required for high-availability systems. You need one ERS for each Java SCS and one ERS for each ABAP SCS (ASCS) installed in your system.

**Hardware Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk space</td>
<td>- Hard disk drives with sufficient space for the central services instance</td>
</tr>
<tr>
<td></td>
<td>- For more information, see <em>SAP Directories</em> [page 59].</td>
</tr>
<tr>
<td></td>
<td>- 4.3 GB of temporary disk space for every required installation DVD that you</td>
</tr>
<tr>
<td></td>
<td>have to copy to a local hard disk. For more information, see *Preparing the</td>
</tr>
<tr>
<td></td>
<td>Installation DVDs* [page 72].</td>
</tr>
<tr>
<td></td>
<td>- 1.2 GB of temporary disk space for the installation.</td>
</tr>
<tr>
<td>RAM</td>
<td>0.5 GB (minimum), 1 GB (recommended)</td>
</tr>
<tr>
<td>Swap Space</td>
<td>Hard disk drives with sufficient space for swap: 3 to 4 * RAM, at least 20 GB</td>
</tr>
</tbody>
</table>

**Software Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>Network File System (NFS) must be installed.</td>
</tr>
</tbody>
</table>
3.2.5.3 Requirements for the Database Instance

The database host must meet the following requirements:

**Hardware Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Disk space       | - Space requirements of the SAP data file systems, see the following file: 
                  |   `<Export_DVD>/DATA_UNITS/EXPORT_1/DB/ADA/DBSIZE.XML` 
                  |   The XML table in this file contains a field called fDevSize, which 
                  |   contains the size in MB of the element indicated in the previous field, 
                  |   fDevName. This shows you the size of the data (DBDATADEV) and the 
                  |   log (DBLOGDEV) volumes.                                                   |
|                  | ![Note](image)                                                                          |
|                  | The values listed in DBSIZE.XML are only for guidance.                                  |
|                  | For more information about the required disk space per file system, see Setting Up File Systems [page 59]. |
|                  | For security reasons (system failure), the file systems must be 
                  |   distributed physically over at least three (but five are recommended) 
                  |   disks.                                                                   |
|                  | - Database software:                                                                     |
|                  |   - Version 7.6: 500 MB                                                                  |
|                  |   - Version 7.7: 700 MB                                                                  |
|                  | - 4.5 GB of temporary disk space for every required installation DVD 
                  |   you have to copy to a local hard disk.                                          |
|                  |   For more information, see Preparing the Installation DVDs [page 72].                   |
|                  | - 1.2 GB of temporary disk space for the installation.                                   |
| RAM              | 1 GB                                                                                   |
| Swap space       | - Recommended: 3*RAM + 500 MB                                                          |
|                  | - Minimum: 2*RAM                                                                        |

**Software Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Network File System (NFS)    | If application servers are installed decentralized, Network File System (NFS) must be 
                                | installed.                                                                           |
| Required fonts and code pages| Make sure that the required fonts and code pages are installed.                        |
| National Language Support (NLS)| Make sure that National Language Support (NLS) and corresponding 
                                | sapplocales are installed.                                                           |
| Operating systems            | - For supported operating system releases, see SAP Service Marketplace 
|                              | - Contact your operating system vendor for the latest OS patches.                      |
3.2.5.4 Requirements for the Primary Application Server Instance

The host where the primary application server instance runs must meet the following requirements:

Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk space</td>
<td>■ Hard disk drives with sufficient space for the central instance. For more information, see SAP Directories [page 59].</td>
</tr>
<tr>
<td></td>
<td>■ 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. For more information, see Preparing the Installation DVDs [page 72].</td>
</tr>
<tr>
<td></td>
<td>■ 1.2 GB of temporary disk space for the installation.</td>
</tr>
<tr>
<td>RAM</td>
<td>1.0 GB (minimum), 3 GB (recommended)</td>
</tr>
<tr>
<td>Swap Space</td>
<td>Hard disk drives with sufficient space for swap: 3 to 4 * RAM, at least 1 GB. (minimum), 3 GB (recommended)</td>
</tr>
</tbody>
</table>

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>If application servers are installed decentralized, Network File System (NFS) must be installed.</td>
</tr>
<tr>
<td>Required fonts and code pages</td>
<td>Make sure that the required fonts and code pages are installed.</td>
</tr>
<tr>
<td>National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding saplocales are installed.</td>
</tr>
</tbody>
</table>

3.2.6 Requirements for an Additional Application Server Instance

The additional application server host must meet the following requirements:

Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk space</td>
<td>■ Hard disk drives with sufficient space for the dialog instance. For more information, see SAP Directories [page 59].</td>
</tr>
<tr>
<td></td>
<td>■ 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. For more information, see Preparing the Installation DVDs [page 72].</td>
</tr>
<tr>
<td></td>
<td>■ 1.2 GB of temporary disk space for the installation.</td>
</tr>
</tbody>
</table>
3.2 Hardware and Software Requirements

### 3.2.7 Requirements for the Host Agent as a Separate Installation

If you want to install the host agent separately, the installation host has to meet the following requirements:

<table>
<thead>
<tr>
<th>Requirement Type</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>■ DVD drive</td>
</tr>
</tbody>
</table>
|                  | ■ Minimum disk space  
|                  | For information about the required disk space per file system, see Setting Up File Systems [page 59]  |
|                  | ■ 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. For more information, see Preparing the Installation DVDs [page 72].  |
|                  | ■ 1.2 GB of temporary disk space for the installation.  |
|                  | ■ RAM:  
|                  | 40 MB  |
|                  | ■ Hard disk drives with sufficient space for swap:  
|                  | 3 to 4 * RAM, at least 120 MB  |
| Software         | ■ Network File System (NFS) must be installed.  |

### 3.2.8 Checking and Modifying the AIX Kernel

See SAP Note [62813] for more information about kernel parameters with AIX.
3.2.9 Setting up Swap Space for AIX

1. Check the allocated swap space:
   a) To start the System Management Interface Tool (SMIT), enter the following command:
      \texttt{smitty}.
   b) Perform one of the following steps:
      - Choose \texttt{Physical & Logical Storage} \texttt{\rightarrow Logical Volume Manager} \texttt{\rightarrow Paging Space} \texttt{\rightarrow List All Paging Spaces}.
      - Enter this command:
        \texttt{lsps -a}
   2. Check if there is sufficient swap space: 3 to 4 * RAM is recommended, at least 20 GB.
   3. If required, add another paging space using \texttt{smitty}:
      a) Choose \texttt{Physical & Logical Storage} \texttt{\rightarrow Logical Volume Manager} \texttt{\rightarrow Paging Space} \texttt{\rightarrow Add Another Paging Space}.
         A list of volume group names is displayed.
      b) Select a volume group.
      c) Enter the size of paging space in logical partitions.
      d) Set \texttt{Start using this paging space NOW ?} to \texttt{YES}.
      e) Set \texttt{Use this paging space each time the system is RESTARTED} to \texttt{YES}.
      f) To exit \texttt{smitty}, choose \texttt{[F10]}.
      g) To check the results, follow the procedure described above in step 1.

Only valid for: HA (UNIX)

3.3 Performing Switchover Preparations for High Availability

Do the following to prepare the switchover cluster:

\textbf{Procedure}

1. Set up Domain Name System (DNS) on the virtual host.
2. Assign the virtual IP addresses and host names for the SCS and ASCS instances, and (if required) NFS to appropriate failover groups.

\textbf{Note}

For more information on virtual addresses and virtual host names and how to assign resources to failover groups, ask your HA partner.

\textbf{More Information}

For more information about the use of virtual TCP/IP host names, see SAP Note 962955.
3.4 Creating Operating System Users and Groups

During the installation, SAPinst checks all required accounts (users, groups) and services on the local machine. SAPinst checks whether the required users and groups already exist. If not, it creates new users and groups as necessary.

If you do not want SAPinst to create operating systems users, groups and services automatically, you can optionally create them before the installation. This might be the case if you use central user management, for example, Network Information System (NIS).

SAPinst checks if the required services are available on the host and creates them if necessary. See the log messages about the service entries and adapt the network-wide (NIS) entries accordingly.

SAPinst checks the NIS users, groups, and services using NIS commands. However, SAPinst does not change NIS configurations.

↑ Recommendation
For a distributed or a high-availability system, we recommend that you distribute account information (operating system users and groups) over the network, for example by using Network Information Service (NIS).

↑ Caution
All users must have identical environment settings. If you change the environment delivered by SAP, such as variables, paths, and so on, we do not assume responsibility.

If you want to use global accounts that are configured on a separate host, you can do this in one of the following ways:

- You start SAPinst and choose Software Life-Cycle Tasks → Additional Preparation Tasks → Operating System Users and Groups. For more information, see Running SAPinst [page 79].
- You create operating system users and groups manually as described in Creating AIX Groups and Users (Optional) [page 55]

Operating System Users and Groups
SAPinst chooses available operating system user IDs and group IDs unless you are installing an additional application server instance. On an additional application server instance you have to enter the same IDs as on the primary application server instance host.

↑ Caution
Do not delete any shell initialization scripts in the home directory of the OS users, even if you do not intend to use the shells that these scripts are for.
3.4 Creating Operating System Users and Groups

⚠️ Caution
If you create the sdb user manually, make sure that you lock it for the installation. SAPinst normally locks this user after it has been created.

⚠️ Caution
The user ID (UID) and group ID (GID) of each operating system user and group must be identical for all servers belonging to the same SAP system.

This does not mean that all users and groups have to be installed on all SAP servers.

Users and Their Primary Groups

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;sapsid&gt;adm</td>
<td>sapsys</td>
</tr>
<tr>
<td>sqd&lt;dbsid&gt;</td>
<td>sapsys</td>
</tr>
<tr>
<td>sdb</td>
<td>sdba</td>
</tr>
</tbody>
</table>

Operating System User for the Host Agent

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapadm</td>
<td>sapsys, sapinst</td>
</tr>
</tbody>
</table>

⚠️ Caution
If these operating system users already exist, make sure that they are assigned to group sapinst.

⚠️ Caution
If you install a distributed system and you do not use central user management (for example, NIS), and you use local operating system user accounts instead, <sapsid>adm and the database operating system user must have the same password on all hosts.

Groups and Members

<table>
<thead>
<tr>
<th>Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapsys</td>
<td>sqd&lt;dbsid&gt;, &lt;sapsid&gt;adm</td>
</tr>
<tr>
<td>sdba</td>
<td>sdb, &lt;sapsid&gt;adm, sqd&lt;dbsid&gt;</td>
</tr>
</tbody>
</table>

Operating System User for the Host Agent

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapadm</td>
<td>sapsys, sapinst</td>
</tr>
</tbody>
</table>
3.4.1 Creating AIX Groups and Users (Optional)

Creating AIX Groups and Users
To create AIX groups and users, use the System Management Interface Tool (SMIT):

1. Create groups as follows:
   a) Enter the command `smitty`.
   b) Choose | Security and Users | Groups | Add a group |.
   c) Enter a group name – for example, `sapsys` – and set administration group to `true`.

2. To create users, proceed as follows:
   a) Enter a user name, for example `<sapsid>adm`.
   b) Enter all required values.

3. Set the initial password using the following command:
   ```
   passwd <user>
   ```

Checking Created Users
As user `root` check all existing users as follows:

1. Enter the command `smitty`.
3. To get a list of users, choose `[F4]`.
4. For user `root` and each created user `<user>` perform the following steps:
   a) Select `<user>`.
   b) Change field Soft CPU time to `-1` (this is the default value).
   c) Change field Soft CORE file size to `-1` (this is the default value).
   d) Change field Soft FILE size to `-1`.
   e) Change field Soft DATA segment to `-1`.
   f) Change field Soft STACK size to `-1`.

Note

For more information, see SAP Note 628131.

You must make sure that the system-wide default HARD values are not explicitly defined to be lower than the values given above. Check the file `/etc/security/limits` under the default stanza. If they are not explicitly set, then the values are as shown in the table at the top of the file.

Checking the Operating System

1. Enter the command `smitty`.
3. Change `Maximum number of PROCESSES allowed per user` to 500.  
4. To exit SMIT, choose `F10`.  

### 3.5 Preparing User Management for an External ABAP System

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

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

You can take one of the following approaches:

<table>
<thead>
<tr>
<th>Approach</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Java system uses different users</td>
<td>No interdependencies between the connected engines</td>
<td>Initially more administration to create the users in the ABAP system</td>
</tr>
</tbody>
</table>
| All Java systems use the same configuration | You create the users only once and enter the same information for every Java systems that you install. | Interdependencies between the connected engines:  
- If you change the password of any of the users on the ABAP system, this change affects all connected engines.  
- If you change the administrator user’s password, you must also change the password in secure storage on all of the connected Java systems |

**Recommendation**

For security reasons, we recommend the first approach.

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

**Prerequisites**

- The ABAP system is based on at least SAP Web AS ABAP release 6.20 SP25.
- In transaction PFCG, check that the roles `SAP_BC_JSF_COMMUNICATION` and `SAP_BC_JSF_COMMUNICATION_RO` exist and make sure that their profiles are generated.
- In transaction PFCG, check that the roles `SAP_J2EE_ADMIN`, `SAP_J2EE_GUEST` and `SAP_BC_FP_ICF` exist. Neither role contains any ABAP permissions, so you do not need to generate any profiles.
- In transaction PFCG, create a role named `ADSCallers`. You do not need to maintain authorization data or generate any profiles for that role.
- For more information, see:
Administration of the ABAP system

Perform the following administration steps in the ABAP system:

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

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

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

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

   **Recommendation**
   
   We recommend that you name the user `J2EE_ADMIN_<SAPSID_Java_System>`. You can use any password.

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

3. In transaction SU01 create a new dialog user and assign it to role `SAP_J2EE_GUEST`. This is your guest user in AS Java.
Recommendation

We recommend that you name the user J2EE_GST_<SAPSID_Java_System>. You can use any password.

As this user is only used for anonymous access to the system, we recommend you to deactivate the password and, if required, lock it after installation to prevent anyone from using it for explicit named logons.

4. In transaction SU01 create the following dialog users:

Caution

You must have changed the initial passwords [page 104] of these users before you start the installation of the Java system.

- Users for Adobe Document Services (ADS) (optional):
  - ADSUSER:
    In transaction PFCG, assign the role ADSCallers to this user.
  - ADS_AGENT:
    In transaction PFCG, assign the role SAP_BC_FP_ICF to this user.

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

Recommendation

We recommend that you name this user SLDDUSER

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

Recommendation

We recommend that you name this user SLDAPUSER

Note

For more information on SLD users and security roles, see the SLD User Guide at
NetWeaver Software Life Cycle Management Configuring, Working with and Administering System Landscape Directory Administering the SLD.
Activities for the Java System

Perform the following steps in the Java system:

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

### 3.6 Setting Up File Systems and Raw Devices

The following section(s) describe the directory structures for the SAP system, how to set up SAP file systems for the SAP system and, if required, raw devices on operating system level:

**Note**
The installation of any SAP system does not require a special file system setup or separate partitions.

- SAP Directories [page 59]
- Performing Switchover Preparations for High Availability [page 52]
- MaxDB Directories [page 62]
- Setting Up File Systems for High-Availability [page 63]
- Configuring Network File System for High Availability [page 65]
- Setting Up File Systems and Raw Devices for AIX [page 67]

### 3.6.1 SAP Directories

Here we describe the directories of a typical SAP system. SAPinst creates the following types of directories:

- Physically shared directories, which reside on the global host and are shared by Network File System (NFS)
- Logically shared directories, which reside on the local host(s) with symbolic links to the global host
- Local directories, which reside on the local host(s)

**Features**
The following figure shows the directory structure of the SAP system:
**Figure 12: Directory Structure for a Java System**

<table>
<thead>
<tr>
<th>Physically shared directories</th>
<th>Logically shared directories</th>
<th>Local directories</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/</code> (root)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>&lt;sapmnt&gt;</code></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>&lt;SAPSID&gt;</code></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>trans</code></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>SYS</code></td>
<td><code>log</code></td>
<td><code>log</code></td>
</tr>
<tr>
<td><code>global</code></td>
<td><code>data</code></td>
<td><code>data</code></td>
</tr>
<tr>
<td><code>profile</code></td>
<td><code>work</code></td>
<td><code>work</code></td>
</tr>
<tr>
<td><code>exe</code></td>
<td><code>j2ee</code></td>
<td><code>exe</code></td>
</tr>
<tr>
<td><code>&lt;codepage&gt;</code></td>
<td><code>&lt;codepage&gt;</code></td>
<td><code>&lt;codepage&gt;</code>: Unicode</td>
</tr>
<tr>
<td><code>&lt;platform&gt;</code></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbolic link</td>
<td>Replication by sapcpe</td>
<td></td>
</tr>
<tr>
<td>[ERS&lt;No&gt;]: High availability only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Physically Shared Directories**

SAPinst creates the following directories:

- The directory `/<sapmnt>/<SAPSID>`, which contains SAP kernel and related files, is created on the first installation host. Normally, the first installation host is the host on which the central services instance is to run, but you can also choose another host for `/<sapmnt>/<SAPSID>`.

  You need to manually share this directory with Network File System (NFS) and — for a distributed system — mount it from the other installation hosts.

  SAPinst creates the following shared directories during the SAP system installation:
  
  - `global`
    - Contains globally shared data
  
  - `profile`
    - Contains the profiles of all instances
  
  - `exe`
    - Contains executable kernel programs

- The directory `/usr/sap/trans`, which is the global transport directory.

  If you want to use an existing transport directory, you have to mount it before you install the application server instance in question. Otherwise SAPinst creates `/usr/sap/trans` locally.

  For more information, see *Exporting and Mounting the Global Transport Directory* [page 68].
### Directory Requirements

<table>
<thead>
<tr>
<th>Directory</th>
<th>Required Disk Space</th>
</tr>
</thead>
</table>
| `<sapmnt>/SAPSID>` | - Primary application server instance: 1.5 GB  
- Central services instance: 1.0 GB  
- Additional application server instance: no file system required |
| `/usr/sap/trans` | This value heavily depends on the use of your SAP system. For production systems, we recommend using as much free space as possible (at least 2.0 GB), because the space requirement grows dynamically. For the installation, it is sufficient to use 200 MB for each SAP system instance. You can enlarge the file system afterwards. |

### Logically Shared Directories

SAPinst creates the directory `/usr/sap/<SAPSID>/SYS` on each host. The sub-directories contain symbolic links to the corresponding sub-directories of `/<sapmnt>/<SAPSID>` on the first installation host, as shown in the figure above. Whenever a local instance is started, the sapce program checks the executables against those in the logically shared directories and, if necessary, replicates them to the local instance.

### Local Directories

The directory `/usr/sap/<SAPSID>` contains files for the operation of a local instance as well as symbolic links to the data for one system. This directory is physically located on each host in the SAP system and contains the following subdirectories:

<table>
<thead>
<tr>
<th>Directory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS</td>
<td></td>
</tr>
<tr>
<td><code>&lt;INSTANCE&gt;</code></td>
<td>for each instance installed on the host</td>
</tr>
</tbody>
</table>

The instance-specific directories have the following names:

- The directory both of the primary application server instance and of an additional application server instance is called `<Instance_Number>`.
- The directory of the central services instance is called `SCS<Instance_Number>`.
- The directory of the Enqueue Replication Server instance is called `ERS<Instance_Number>`.

---

**Note**

The subdirectories of `/usr/sap/<SAPSID>/SYS` have symbolic links to the corresponding subdirectories of `/<sapmnt>/<SAPSID>`, as shown in the figure above.
**3.6 Setting Up File Systems and Raw Devices**

### Directory Requirements

<table>
<thead>
<tr>
<th>Directory</th>
<th>Required Disk Space</th>
</tr>
</thead>
</table>
| `/usr/sap/<SAPSID>` | Primary application server instance  
  - AS Java: 1.5 GB  
  - For BI add 2.0 GB.  
  - For EP add 2.0 GB.  
  Additional application server instance:  
  See the space requirements above for the primary application server instance minus one third of the space requirements for Java software units or usage types.  
  Central services instance:  
  - 1.0 GB |

### 3.6.2 MaxDB Directories

These are the directories for the MaxDB database:

**MaxDB Directories**

<table>
<thead>
<tr>
<th>Directory Name</th>
<th>Description</th>
<th>Space Required</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/sapdb/&lt;DBSID&gt;/sapdata</code></td>
<td>MaxDB data</td>
<td>See the table Hardware Requirements in Requirements for the Database Instance [page 45].</td>
</tr>
<tr>
<td><code>/sapdb/&lt;DBSID&gt;/saplog</code></td>
<td>MaxDB redologs</td>
<td>See the table Hardware Requirements in Requirements for the Database Instance [page 45].</td>
</tr>
<tr>
<td><code>/sapdb</code></td>
<td>MaxDB software</td>
<td>See the table Hardware Requirements in Requirements for the Database Instance [page 45].</td>
</tr>
</tbody>
</table>

**Note**

If the database data is installed on raw devices, you do not need to set up `/<sapdata>`.  
If the database redologs is installed on raw devices, you do not need to set up `/<sapdblog>`.  

### 3.6.3 Host Agent Directories

For the host agent, the following directories are required:
### 3.6.4 Setting Up File Systems for a High-Availability System

When you prepare a high-availability (HA) installation with switchover software, you need to set up your file systems as described here. For more information, consult your HA partner.

**Prerequisites**

You have already installed the hardware — that is, hosts, disks, and network — and decided how to distribute the database, SAP instances, and (if required) Network File System (NFS) server over the cluster nodes (that is, over the host machines). For more information, see *Planning the Switchover Cluster* [page 26].

**Procedure**

1. Create the file systems or raw partitions for the central services instance on shared disks. For more information, see *Setting Up File Systems and Raw Devices* [page 59].

   ![Note]

   The file systems `/sapmnt/<SAPSID>` and `/usr/sap/trans` are Network File Systems (NFS). However, `/usr/sap/<SAPSID>/<INSTTYPE><NR>`, which should be part of a cluster, is a file system of the AS instance that is always mounted on the cluster node currently running the instance (not with NFS). Therefore, if the host running the primary application server instance is not the NFS server host, you might have to mount the file systems `/sapmnt/<SAPSID>` and `/usr/sap/trans` on different physical disks from the file system `/usr/sap/<SAPSID>/<INSTTYPE><NR>`.

2. Use the following approach for the `/usr/sap/<SAPSID>/<INSTTYPE><NR>` file system, as described below.
   The file system contains at least two subdirectories:
   - `SYS` contains links to the central directory `/sapmnt/<SAPSID>`
3.6 Setting Up File Systems and Raw Devices

- `<INSTTYPE><NR>` – where the name is defined by the type of services and the application server number, for example `SCS<NR>` – which contains data for the local Java central services instance. Only the latter directory needs to be migrated with the AS instance during the switchover. Since the `SYS` subdirectory contains only links that do not require any space, you can create it locally on each cluster node. Other local instances can also reside locally, such as an Enqueue Replication Server instance in `/usr/sap/<SAPSID>/ERS<NR>`, which should not be affected by a switch over. Therefore, instead of `/usr/sap/<SAPSID>/`, create a file system `/usr/sap/<SAPSID>/<INSTTYPE><NR>` with the usual `<>` substitutions.

The instance-specific directory name for the central services instance is normally `SCS<NR>`. Migrating only this directory avoids mount conflicts when switching over to a node on which another AS instance is already running. The `SCS<NR>` directory can join the `/usr/sap/<SAPSID>` tree instead of mounting on top of it.

![Note]

This approach becomes increasingly important when you want to cluster the central services instances with other local instances running on the cluster hosts outside the control of the switchover software. This applies to the Enqueue Replication Server (ERS) and additional ABAP or Java application server instances. The result is a more efficient use of resources. You must use this approach for integrated installations of the application server with ABAP and Java stacks.

3. You assign the **local** file systems to mount points.
4. You assign the **shared** file systems to mount points in appropriate failover groups.

![Example]

The graphic below shows an example of the file systems and disks in an HA setup

Note that this is only an example. For more information on a setup that meets your needs, consult
your HA partner.

**Figure 13:**

![Diagram showing local and shared disks for Node A and Node B]

End of: HA (UNIX)

Only valid for: HA (UNIX)

### 3.6.5 Configuring Network File System for a High-Availability System

If required, you configure Network File System (NFS), which is a system-wide Single Point-of-Failure (SPOF), for a high-availability (HA) installation with switchover software. For more information consult your HA partner.

We regard NFS as an extension to the operating system. The switchover product protects NFS and makes it transparently available to the SAP system in switchover situations.

You need to decide:

- How to protect NFS
- Which switchover cluster nodes NFS is to run on

The NFS configuration might depend on your database system. The directories need to be available for the SAP system before and after a switchover.
Procedure

1. Check the NFS directories, several of which need to be shared between all instances of a system. These directories are:
   - `/sapmnt/<SID>/profile`
     Contains the different profiles to simplify maintenance
   - `/sapmnt/<SID>/global`
     Contains log files of batch jobs and central SysLog
   - `/usr/sap/trans`
     Contains data and log files for objects transported between different SAP systems (for example, development → integration). This transport directory ought to be accessible by at least one AS instance of each system, but preferably by all.
   - `/sapmnt/<SID>/exe`
     Contains the kernel executables. These executables ought to be accessible on all AS instances locally without having to use NFS. The best solution is to store them locally on all AS instance hosts.

2. Since you can protect NFS by a switchover product, it makes sense to install it on a cluster node. The requirements of your database system might dictate how NFS has to be set up. If required, you can configure the NFS server on the cluster node of the clustered application server instance or the DB.

In both cases the NFS clients use the virtual IP address to mount NFS. If the second node is used as an additional SAP instance during normal operation (for example, as an additional application server instance), it also needs to mount the directories listed above from the primary node.

When exporting the directories with their original names, you might encounter the problem of a “busy NFS mount” on the standby node. You can use the following workaround to solve this problem:

a) On the primary server, mount the disks containing the directories:
   ```
   /export/usr/sap/trans
   /export/sapmnt/<SID>
   ```
b) The primary server creates soft links to the directories with the original SAP names:
   ```
   /usr/sap/trans -> /export/usr/sap/trans
   /sapmnt/<SID> -> /export/sapmnt/<SID>
   ```
   Alternatively the primary server can also mount the directories:
   ```
   /export/usr/sap/trans -> /usr/sap/trans
   /export/sapmnt/SID -> /sapmnt/<SID>
   ```
c) The primary server exports:
   ```
   /export/usr/sap/trans
   /export/sapmnt/<SID>
   ```
d) The standby NFS mounts:
   ```
   from virt.IP:/export/usr/sap/trans to /usr/sap/trans
   from virt.IP:/export/sapmnt/<SID> to /sapmnt/<SID>
   ```
If the primary node goes down and a switchover occurs, the following happens:

- These directories on the standby node become busy:
  - `/usr/sap/trans`
  - `/sapmnt/<SID>`
- The standby node mounts disks to:
  - `/export/usr/sap/trans`
  - `/export/sapmnt/<SID>`
- The standby node configures the virtual IP address `virt.IP`
- The standby node exports:
  - `/export/usr/sap/trans`
  - `/export/sapmnt/<SID>`
- These directories on the standby node are accessible again:
  - `/usr/sap/trans`
  - `/sapmnt/<SID>`

3.6.6 Setting Up File Systems and Raw Devices for AIX

### Setting up File Systems

1. Create one logical volume for each file system listed in the appropriate SAP profile:
   a) Using SMIT, choose "Physical & Logical Storage" ➤ "Logical Volume Manager" ➤ "Logical Volumes" ➤ "Add a Logical Volume".
   b) Enter a volume group name, for example, `sapr3vg`.
   c) Enter a logical volume name, for example, `lvsap01`.
   d) Enter the number of logical partitions.
   e) Press `F3` until the Physical & Logical Storage menu appears.

2. Create the file systems.
      - If you want to use large enabled file systems for files larger than 2 GB, you have to choose "Add a Large File Enabled Journaled File System" instead of "Add a Standard Journaled File System".
      - If you want to use JFS2 file systems, you have to choose "Enhanced Journaled File System" instead of "Journaled File System".
   b) To get a list of logical volumes, choose `F4`.
3.7 Exporting and Mounting the Global Transport Directory

In your SAP system landscape, a global transport directory for all SAP systems is required. During the installation, you can select the check box SAP System will be under NWDDI control on the screen NWDDI Landscape. Then SAPinst copies all SCAs belonging to the software units that you installed to the global transport directory.

- If this global transport directory already exists, make sure that it is exported on the global transport directory host and mount it on the SAP instance installation host.
- If this global transport directory does not exist, proceed as follows:
  - Create the transport directory (either on the host where the primary application server instance is running or on a file server).
  - Export it on the global transport directory host.
  - If you did not create the transport directory on your SAP instance installation host, mount it there.

**Exporting the Transport Directory**

1. Log on as user root to the host where the global transport directory `/usr/sap/trans` resides.
2. Make sure that `/usr/sap/trans` belongs to the group `sapsys` and to the user `root`.
3. If not already done, export the directory using Network File System (NFS).

**Mounting the Transport Directory**

**Note**

If the transport directory resides on your local SAP instance installation host, you do not need to mount it.

1. Log on as user root to the host of the primary or additional application server instance, where `/usr/sap/trans` is to be mounted.
2. Create the mount point `/usr/sap/trans`.

**More Information**

[Mounting Directories via NFS for AIX (Optional)](http://help.sap.com) [page 69]

### 3.8 Exporting and Mounting Directories via NFS for AIX (Optional)

There are two ways of mounting directories via NFS:

- Manually
- Using the System Management Interface Tool (SMIT)
Procedure

To mount directories via NFS from the host on which the directory to be mounted resides:

1. Log on as user root.
2. To start NFS services at the host on which the directory to be mounted resides, use SMIT as follows:
   a) Enter the command `smitty`.
   b) Choose `Communications Applications and Services ▶ NFS ▶ Network File System (NFS) ▶ Configure NFS on this System ▶ Start NFS`.
   c) In the line `Start NFS now, on system restart or both`, enter: `both`.
   d) Choose [ENTER].
3. Export the directory (for example `<sapmnt>/<SAPSID>/exe`) with read or read-write access for the host on which the additional instance runs:
   a) Enter the command `smitty`.
   b) Choose `Communications Applications and Services ▶ NFS ▶ Network File System (NFS) ▶ Add a Directory to Exports List`.
   c) Enter the path of the directory which you want to export (for example, `<sapmnt>/<SAPSID>/exe`).
   d) Choose export mode (use read-write or read-only as required by SAP). In the line `HOSTS allowed root access`, enter the name of the host on which the additional instance runs. For security reasons, this root access should be disabled after the installation.
   e) In the line `Export directory now, system restart or both`, enter: `both`.
   f) Choose [ENTER].
4. Create the mount point at the host on which the additional instance runs: `/usr/bin/mkdir <sapmnt>/<SAPSID>/SYS/exe`
5. Mount the directory on the host on which the additional instance runs.
   a) Enter the command `smitty`.
   b) Choose `Communications Applications and Services ▶ NFS ▶ Network File System (NFS) ▶ Add a File System for Mounting`.
   c) Enter the path name of the mount point.
   d) Enter the path name of the remote directory (the directory of the primary application server instance).
   e) Enter the host where the remote directory resides.
   f) Set `Mount now, add entry to /etc/filesystems or both` to `both`.
   g) Set `/etc/filesystems entry will mount the directory on system RESTART` to `yes`.
   h) Change `Mount file system soft or hard` to `soft` and press [ENTER].
6. If you exported the directory with read-write access, check if the host on which the future additional instance will run has write access to directory `<sapmnt>/<SAPSID>/exe` using the following commands:
   - `cd <sapmnt>/<SAPSID>/SYS/exe`
   - `touch test` (create a file called `test`)
   - `ls -l test` (check if file `test` is created)
3.9 Generating the SAP Solution Manager Key

The SAP Solution Manager is the strategic application management platform for customers and for collaboration between customers and SAP. You need a SAP Solution Manager to upgrade or install all SAP software.

During the installation of the primary application server instance, you are prompted to enter the SAP Solution Manager Key.

You can generate all needed keys for your entire system landscape – development, quality assurance, and production systems – in one SAP Solution Manager system. Even if you plan to install several solution landscapes (for example in different countries), one SAP Solution Manager is still sufficient. For more information about SAP Solution Manager, see http://service.sap.com/solutionmanager.

Prerequisites

- You require at least SAP Solution Manager 4.0 Support Package Stack (SPS) 9.
- If required, you can install SAP Solution Manager:
  - You order SAP Solution Manager as described in SAP Note 628901.
  - You install SAP Solution Manager as described in the documentation Installation Guide – SAP Solution Manager 4.0 on <OS> : <Database> on SAP Service Marketplace at:
    http://service.sap.com/instguides SAP Components SAP Solution Manager Release 4.0

Procedure

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

This section describes how to prepare the installation DVDs, which are available as follows:

- You obtain the installation DVDs as part of the installation package, which is the normal case.
- You download the installation DVDs from SAP Service Marketplace, as described at the end of this section.

The tables below list the installation DVDs that are required for each instance of your SAP system. Depending on your installation type, one or more instances can reside on the same host. You need to keep this in mind when you make the required installation media available on each installation host.

**Recommendation**

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

**Caution**

If you perform a local installation and there is only one DVD drive available on your installation host, you must copy at least the Installation Master DVD to the local file system.

**Note**

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

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

**Caution**

The media names listed in the tables below are abbreviated.

**Note**

You can find the Software Component Archives (SCAs) for the installation of SAP NetWeaver usage types on the NetWeaver Java DVD.
The following table shows the required DVDs for the installation of a productive system of SAP NetWeaver Composition Environment:

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required DVDs</th>
</tr>
</thead>
</table>
| Central services instance, primary application server instance, additional application server instance | - Installation Master DVD  
- NetWeaver Java DVD  
- RDBMS Client DVD  
- RDBMS DVD  
- Kernel DVD                                                                 |

<table>
<thead>
<tr>
<th>Database instance</th>
<th>Required DVDs</th>
</tr>
</thead>
</table>
|                   | - Installation Master DVD  
- NetWeaver Java DVD  
- Kernel DVD  
- RDBMS DVD                                                                 |

Host Agent (Standalone)

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required DVDs</th>
</tr>
</thead>
</table>
| Host Agent                | - Installation Master DVD  
- Kernel DVD                                                                 |

2. Mount the required DVDs for your installation.
   - Mount the DVDs locally. We do not recommend that you use Network File System (NFS), because reading from DVDs mounted with NFS might fail.
   - If you need information about how to mount DVDs on AIX, see Mounting a CD / DVD for AIX [page 120].
   - Use one of the following methods to make DVDs available in parallel:
     - Before the installation:
       - Have sufficient DVD drives
       - Copy DVDs manually to local hard disks
     - During the installation:
       Use the SAPInst Media Browser dialog. You can check the entered location and then copy the entire DVD to the path you entered in the Copy Package to column.

**Downloading Installation DVDs from SAP Service Marketplace (Optional)**

You normally obtain the installation DVDs as part of the installation package from SAP. However, you can also download installation DVDs from SAP Service Marketplace at:

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

**Note**

If you download installation DVDs, note that DVDs might be split into several files. In this case, you have to reassemble the required files after the download.
**Caution**

To extract the downloaded SAR files make sure that you use the latest SAPCAR version, which you can find on SAP Service Marketplace at [http://service.sap.com/swdc](http://service.sap.com/swdc). You need at least SAPCAR 700 or SAPCAR 640 with patch level 4 or higher because older versions of SAPCAR can no longer unpack current SAR files. For more information, see SAP Note **212876**.

1. Create a download directory on the host on which you want to run SAPinst.
2. Identify all download objects that belong to one installation DVD according to one or both of the following:
   - **Material number**
     All download objects that are part of an installation DVD have the same material number and an individual sequence number:
     \(<\text{material\_number}\>_<_\text{sequence\_number}\>
     
     **Example**
     
     51031387_1  
     51031387_2  
     ...

   - **Title**
     All objects that are part of an installation DVD have the same title, such as
     \(<\text{solution}><\text{DVD\_name}><\text{OS}>\text{ or }\text{database}<\text{OS}>\text{ for RDBMS DVDs.}

3. Download the objects to the download directory.
4. Extract the individual download objects using SAPCAR, starting with the lowest sequence number – for example 51031387_1, then 51031387_2, and so on.
   During the download SAPCAR sets up the structure of the installation DVD.

**Note**

SAPCAR asks if you want to replace existing files, for example **LABELIDX.ASC**. Always accept with **Yes**.
4 Installation

Installation Steps for a Standard System

1. You run SAPinst [page 79] to install the SAP system.
2. You can now go to section Post-Installation [page 93] to continue.

Installation Steps for a Distributed System

1. If you want to share the transport directory trans from another system, you have to mount [page 68] it from this system. Otherwise we recommend that you share the trans directory that will be created during the installation of the primary application server instance.
2. On the SAP global host, you do the following:
   a) You export global directories [page 78] in <sapmnt>/<SAPSID> to the database and primary application server instance host.
   b) You run SAPinst [page 79] to install the database instance.
3. On the database instance host, you do the following:
   a) You mount the global directories [page 78] in <sapmnt>/<SAPSID> that you exported from the SAP global host and – optionally – the trans directory that you exported [page 68] from the SAP transport host.
   b) You run SAPinst [page 79] to install the database instance.
4. On the primary application server instance host, you do the following:
   a) You mount the global directories [page 78] in <sapmnt>/<SAPSID> that you exported from the SAP global host.
   b) You run SAPinst [page 79] to install the primary application server instance.
   c) If you want to use the shared transport directory trans from another system, also you also mount [page 68] this directory.
5. If required, you can now install one to n additional application server instance(s) [page 16].
6. You can now go to section Post-Installation [page 93] to continue.

Installation Steps for a High-Availability System

1. If you want to share the transport directory trans from another system, you have to mount [page 68] it from this system. Otherwise we recommend that you share the trans directory that will be created during the installation of the primary application server instance (see below).
2. You set up the switchover cluster infrastructure as follows:
   a) You run SAPinst [page 79] to install the central services instance (SCS) using the virtual host name [page 79] on the primary cluster node, host A.
b) You prepare the standby cluster node, host B, making sure that it meets the **hardware and software requirements** [page 38] and it has all the necessary **file systems** [page 63], mount points, and (if required) Network File System (NFS).

c) You set up the user environment on the standby node, host B.

For more information, see **Creating Operating System Users and Groups** [page 53]. You make sure that you use the same **user and group IDs** [page 53] as on the primary node. You create the home directories of users and copy all files from the home directory of the primary node.

d) You configure the switchover software and test that switchover functions correctly to all standby nodes in the cluster.

e) You perform the switchover to a node where you want to install the enqueue replication server (ERS).

f) You run **SAPinst** [page 79] to install the enqueue replication server (ERS).

g) You repeat the previous two steps for all nodes in the cluster.

3. You export global directories [page 78] in `<sapmnt>/<SAPSID>` to the database host and to the primary application server instance host.

4. On the **database instance host**, you do the following:

   a) You **mount the global directories** [page 78] in `<sapmnt>/<SAPSID>` that you exported from the switchover cluster infrastructure and – optionally – from the SAP transport host.

   b) You run **SAPinst** [page 79] to install the database instance on the **database instance host**.

5. On the **primary application server instance host**, you do the following:

   ![Note](image)

   In a high-availability installation, the primary application server instance does **not** need to be part of the cluster because it is no longer a single point of failure (SPOF). The SPOF is now in the central services instance (SCS), which is protected by the cluster.

   a) You **mount the global directories** [page 78] in `<sapmnt>/<SAPSID>` that you exported from the switchover cluster infrastructure.

   b) You run **SAPinst** [page 79] to install the primary application server instance.

   c) If you want to use the shared transport directory `trans` from another system, you also **mount** [page 68] this directory (see above).

6. We recommend you to install additional application server (AS) instances with SAPinst to create redundancy.

   Since the AS instances are not a SPOF, you do **not** need to include these instances in the cluster.

7. You can now go to section **Post-Installation** [page 93] to continue.

**Installation Steps for an Additional Application Server Instance**

Installation Steps for an Additional Application Server Instance(s) for a Standard System

1. On the **main host** on which your SAP system runs, you do the following:
You export global directories in `<sapmnt>/SAPSID>` to the database and primary application server instance host.

2. On every additional application server instance host, you do the following:
   a) You mount the global directories [page 78] in `<sapmnt>/SAPSID>` that you exported from the SAP global host.
   b) You run SAAPinst [page 79] to install the additional application server instance.
3. You can now go to section *Post-Installation* [page 93] to continue.

**Installation Steps for an Application Server Instance for a Distributed System**

1. If you want to share the transport directory `trans` from another system, you have to *mount* [page 68] it from this system. Otherwise we recommend that you share the `trans` directory that will be created during the installation of the primary application server instance.
2. On the SAP global host, you do the following:
   Export global directories in `<sapmnt>/SAPSID>` to the database and primary application server instance host.
3. On every additional application server instance host, you do the following:
   a) You mount the global directories [page 78] in `<sapmnt>/SAPSID>` that you exported from the SAP global host.
   b) You run SAAPinst [page 79] to install the additional application server instance.
   c) If you want to use the shared transport directory `trans` from another system, also mount [page 68] this directory.
4. You can now go to section *Post-Installation* [page 93] to continue.

**Installation Steps for an Additional Application Server Instance for a High-Availability System**

1. If you want to share the transport directory `trans` from another system, you have to *mount* [page 68] it from this system. Otherwise we recommend that you share the `trans` directory that will be created during the installation of the primary application server instance.
2. On the primary node, host A, of the switchover cluster infrastructure, you do the following:
   You export global directories in `<sapmnt>/SAPSID>` to every additional application server instance host.
3. On every additional application server instance host, you do the following:
   a) You mount the global directories [page 78] in `<sapmnt>/SAPSID>` that you exported from the SAP global host.
   b) You run SAAPinst [page 79] to install the additional application server instance.
   c) If you want to use the shared transport directory `trans` from another system, you also mount [page 68] this directory.
4. You can now go to section *Post-Installation* [page 93] to continue.

**Installation Steps for Additional Components and Tools for SAP NetWeaver CE (Optional)**

- You install additional components [page 88] for SAP NetWeaver Composition Environment, such as.
4.1 Exporting and Mounting Global Directories

If you install a database or an additional application server instance on a host other than the SAP Global host, you must mount global directories from the SAP Global host.

**Prerequisites**

- If you want to install the executables locally instead of sharing them, do not mount the `exe` directory with Network File System (NFS). Instead, create `<sapmnt>/<SAPSID>/exe` as a local directory (not a link) with a minimum of 1100 MB free space.
- If you are installing a heterogeneous SAP system (that is, the instances are installed on different operating-system platforms), do not mount the `exe` directory. For more information, see *Heterogeneous SAP System Installations* [page 127].

**Procedure**

1. Log on to the SAP Global host as user `root` and export the following directories with `root` access to the host on which you want to install the new instance:
   `<sapmnt>/<SAPSID>/exe`
   `<sapmnt>/<SAPSID>/profile`
   `<sapmnt>/<SAPSID>/global`
   For more information, see *Mounting Directories via NFS for AIX* [page 69].
   Make sure that the user `root` of the host on which you want to install the new instance can access the exported directories.
2. Log on to the host of the new instance that you want to install as user `root`.
3. Create the following mount points and mount them from the SAP Global host:
   `<sapmnt>/<SAPSID>/exe`
   `<sapmnt>/<SAPSID>/profile`
   `<sapmnt>/<SAPSID>/global`
4.2 High Availability: Specifying the Virtual Host Name

For a high-availability (HA) system where you want to install the SCS or ASCS instance into a cluster, you can set the environment variable `SAPINST_USE_HOSTNAME` to specify the virtual host name before you start SAPinst.

If you do not set this environment variable now, you can specify an equivalent parameter for the virtual host name when you run `SAPinst` [page 79].

**Procedure**

Set `SAPINST_USE_HOSTNAME` to the virtual host name of the machine on which you are installing an SAP instance.

**More Information**

For more information about the use of virtual TCP/IP host names, see SAP Note 962955.

---

4.3 Running SAPinst

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

This section describes an installation where SAPinst, SAPinst GUI, and the GUI server are running on the same host. If required, you can instead perform a remote installation with `SAPinst` [page 123], where SAPinst GUI is running on a separate host from SAPinst and the GUI server.

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

**Note the following information about SAPinst:**

- SAPinst normally creates the installation directory `sapinstInstdir` directly below the temporary directory. SAPinst finds the temporary directory by checking the value of the environment variables `TEMP`, `TMP`, or `TMPDIR`. If no value is set for these variables, SAPinst uses `/tmp` as default installation directory.

  **Recommendation**

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

- SAPinst creates a subdirectory for each installation option called 
  `<sapinst_instdir>/installation_option_directory>.
- The SAPinst Self-Extractor extracts the SAPinst executables to the temporary directory. These 
  executables are deleted again after SAPinst has stopped running.
  Directories called `sapinst_exe.xxxxx.xxx` sometimes remain in the temporary directory.
  You can safely delete them.
  The temporary directory also contains the SAPinst Self-Extractor log file `dev_selfex.out`, which 
  might be useful if an error occurs.

⚠️ Caution

If SAPinst cannot find a temporary directory, the installation terminates with the error `FC0-00058`.

- During the installation, the default ports 21200, 21212, and 4239 are used for communication 
  between SAPinst, GUI server, SAPinst GUI and HTTP server. SAPinst uses port 21200 to 
  communicate with the GUI server. The GUI server uses port 21212 to communicate with SAPinst 
  GUI. 4239 is the port of the HTTP server which is part of the GUI server. You get an error message 
  if one of these ports is already in use by another service.
  In this case, you must execute SAPinst using the following parameters:
  `SAPINST_DIALOG_PORT=<free_port_number_sapinst_to_gui_server>`
  `GUISERVER_DIALOG_PORT=<free_port_number_gui_server_to_sapinst_gui>`
  `GUISERVER_HTTP_PORT=<free_port_number_http_server>`.
- To get a list of all available SAPinst properties, start SAPinst as described above with the option `-p`:
  `./sapinst -p`.
- If required, you can terminate SAPinst and the SAPinst Self-Extractor by pressing `Ctrl` + `C`.

Using SAPinst GUI

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

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function key</td>
<td>F1</td>
<td>Displays detailed information about each input parameter</td>
</tr>
</tbody>
</table>
4.3 Running SAPinst

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu option</td>
<td>File</td>
<td>Exit</td>
</tr>
<tr>
<td></td>
<td>SAPinst</td>
<td>Log Browser</td>
</tr>
<tr>
<td>Menu option</td>
<td>SAPinst</td>
<td>Cancel</td>
</tr>
<tr>
<td>Button</td>
<td>Retry</td>
<td></td>
</tr>
<tr>
<td>Button</td>
<td>Stop</td>
<td></td>
</tr>
<tr>
<td>Button</td>
<td>Continue</td>
<td></td>
</tr>
</tbody>
</table>

**Prerequisites**

- Make sure that your operating system does not delete the contents of the temporary directory /tmp or the contents of the directories to which the variables TEMP, TMP, or TMPDIR point, for example by using a crontab entry.
  Make sure that the temporary directory has the permissions 777.
- Make sure that you have at least 60 MB of free space in the installation directory for each installation option. In addition, you need 200 MB free space for the SAPinst executables. If you cannot 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.

- Make sure that your DISPLAY environment variable is set to `<host_name>:0.0`, where `<host_name>` is the host on which you want to display the SAPinst GUI.

<table>
<thead>
<tr>
<th>Shell Used</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bourne shell (sh)</td>
<td>DISPLAY=&lt;host_name&gt;:0.0</td>
</tr>
<tr>
<td></td>
<td>export DISPLAY</td>
</tr>
<tr>
<td>C shell (csh)</td>
<td>setenv DISPLAY &lt;host_name&gt;:0.0</td>
</tr>
<tr>
<td>Korn shell (ksh)</td>
<td>export DISPLAY=&lt;host_name&gt;:0.0</td>
</tr>
</tbody>
</table>

- Make sure that you have defined the most important SAP system parameters as described in Basic SAP System Parameters [page 32] before you start the installation.

- Check that your installation host(s) meets the requirements for the installation option(s) that you want to install. For more information, see Running the Prerequisite Checker [page 40].

- If you are installing a second or subsequent SAP system in 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 25].

**Procedure**

1. Log on to your host as user root.

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

2. If you want to install a primary application server instance, a central services instance, a database instance, or an additional application server instance, mount the Installation Master DVD. Mount the DVDs **locally**. We do not recommend that you use Network File System (NFS), because reading from DVDs mounted with NFS might fail.

   For more information about mounting DVDs, see Mounting a CD / DVD for AIX [page 120].

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

   - Using the default installation directory (recommended)

     Enter the following commands:

     ```
     cd <Installation Master_DVD>/IM_<OS>
     ./sapinst
     ```
Note

If you are installing a high-availability system and you have not already set the environment parameter SAPINST_USE_HOSTNAME [page 79] to specify the virtual host name, you can start SAPinst as follows:

```
./sapinst SAPINST_USE_HOSTNAME=<virtual host name>
```

End of: HA (UNIX)

Caution

Make sure that your operating system does not delete the contents of the temporary directory /tmp or the contents of the directories to which the variables TEMP, TMP, or TMPDIR point, for example by using a crontab entry.

Caution

Make sure that your current working directory is not an IM_<OS> directory belonging to another operating system.

For example, the following commands are incorrect and cause an error:

```
$ cd /sapcd2/DATA_UNITS/IM_HPUX_IA64
$ /sapinst
```

The following commands are correct:

```
$ cd /sapcd2/DATA_UNITS/IM_HPUX_PARISC
$ /sapinst
```

Using an alternative installation directory

If you want to use an alternative installation directory, set the environment variable TEMP, TMP, or TMPDIR.

4. In the Welcome screen, choose the required SAPinst installation option from the tree structure. For more information, see SAPinst Installation Options [page 84].

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

Note

To find more information on each parameter during the input phase of the installation, position the cursor on the required parameter and press [F1].

After you have entered all requested input parameters, SAPinst displays the Parameter Summary screen. This screen shows both the parameters that you entered and those that SAPinst set by default. If required, you can revise the parameters before starting the installation.

6. To start the installation choose Start.
SAPinst starts the installation and displays the progress of the installation. When the installation has successfully completed, SAPinst shows the dialog *Execution of <option_name> has been completed successfully.*

7. If required, delete directories with the name `sapinst_exe.xxxxx.xxxx` after SAPinst has finished. Sometimes these remain in the temporary directory.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>If there are errors with SAPinst Self-Extractor, you can find the Self-Extractor log file <code>dev_selfex.out</code> in the temporary directory.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>We recommend that you keep all installation directories until you are sure that the system is completely and correctly installed.</td>
</tr>
</tbody>
</table>

8. We recommend you to delete all files in the directory `<user_home>/sdtgui/`.

9. If you have copied installation DVDs to your hard disk, you can delete these files when the installation has successfully completed.

**More Information**

- [Interrupted Installation with SAPinst](#) [page 121]
- [Performing a Remote Installation with SAPinst (Optional)](#) [page 123]
- [Starting SAPinst GUI Separately (Optional)](#) [page 124]
- [Entries in the Services File Created by SAPinst](#) [page 126]
- [Troubleshooting with SAPinst](#) [page 126]

**4.4 SAPinst Installation Options**

This section provides information about the following installation options in SAPinst:

- [Installation Options](#)
- [Software Life-Cycle Options](#)
### Note

- Choose the required installation options from the tree structure **exactly** in the order they appear for each system variant.
- If you want to use global accounts, which are configured on separate hosts, you must run the installation option *Operating System Users and Groups* **before** you start the installation of the SAP system (see table *Software Life-Cycle Options* below).
- If required, install an additional application server instance for a standard system (all instances on one host) or distributed system by choosing **Additional Application Server Instance**.
- If required, install additional CE components by choosing **Additional CE Components**.
- If required, install SAP Memory Analyzer by choosing **SAP Memory Analyzer**.

### Installation Options

You choose *SAP Systems with* `<your database>` to install a SAP system with usage types or software units. You can install the following system variants:

- **Standard System**

### Installation Options for a Standard System

<table>
<thead>
<tr>
<th>Installation Option</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard System</td>
<td>Installs a complete SAP system including the following instances on one host:</td>
</tr>
<tr>
<td></td>
<td>- Central services instance (SCS)</td>
</tr>
<tr>
<td></td>
<td>- Database instance</td>
</tr>
<tr>
<td></td>
<td>- Primary application server instance</td>
</tr>
<tr>
<td></td>
<td>You can install a standard system in the following parameter modes:</td>
</tr>
<tr>
<td></td>
<td>- Typical Mode</td>
</tr>
<tr>
<td></td>
<td>If you choose <em>Typical</em>, automatic default settings will be provided. You only have to respond to a small selection of prompts. However, you can change any of the default settings on the parameter summary screen.</td>
</tr>
<tr>
<td></td>
<td>- Custom Mode</td>
</tr>
<tr>
<td></td>
<td>If you choose <em>Custom</em>, all installation parameter will be prompted. In the end, you can still change any of these parameters on the parameter summary screen.</td>
</tr>
</tbody>
</table>

**Note**

You require at least usage type AS Java or AS ABAP. You can choose the usage types or software units on the next screen.
### Distributed System

**Installation Options for a Distributed System**

<table>
<thead>
<tr>
<th>Installation Options</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Services Instance (SCS)</td>
<td>Installs a central services instance (SCS) and prepares the SAP global host. Mandatory step in installing a distributed SAP system with usage types or software units based on AS Java.</td>
</tr>
<tr>
<td>Database Instance</td>
<td>Installs a database instance. Mandatory step in installing a distributed SAP system. You must have finished the Central Services Instance (SCS) installation, before you can choose this installation option.</td>
</tr>
<tr>
<td>Primary Application Server Instance</td>
<td>Installs a primary application server instance and enables additional software units. Mandatory step in installing a distributed SAP system on several hosts. You must have finished the database instance installation.</td>
</tr>
</tbody>
</table>

[Only valid for: HA (MSCS); HA (UNIX); HA (z/OS)]

### High-Availability System

**Installation Options for a High Availability System**

<table>
<thead>
<tr>
<th>Installation Options</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Services Instance (SCS)</td>
<td>Installs a central services instance (SCS)</td>
</tr>
<tr>
<td>Database Instance</td>
<td>Installs a database instance</td>
</tr>
<tr>
<td>Enqueue Replication Server Instance</td>
<td>Installs an enqueue replication server, which contains a replica of the lock table (replication server)</td>
</tr>
</tbody>
</table>

**Note**
Make sure that you have configured the SCS instance for the switchover cluster before you start this installation option.

| Primary Application Server Instance     | Installs a primary application server instance and enables additional usage types or software units |
| Additional Application Server Instance  | Installs an additional application server instance                      |

[End of: HA (MSCS); HA (UNIX); HA (z/OS)]
## Software Life-Cycle Options

You use the options located in this folder to perform the following tasks or to install the following components:

<table>
<thead>
<tr>
<th>Installation Option</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| Additional Preparations | Host Agent  
Choose Additional Preparations Host Agent to install the host agent with the profiles SAPSystem=99 and SAPSystemName=SAP. The host agent contains all of the required elements for centrally monitoring any host.  
Normally you do not need to install the host agent separately, because it is automatically installed during the installation of all SAP NetWeaver components, except TREX.  
You only need to install the host agent separately in the following cases:  
- You want to centrally monitor a host that does not have an SAP component.  
- You want to perform an upgrade to SAP NetWeaver.  
For more information, see Host Agent as a Separate Installation [page 19].  
- Operating system users and groups  
Allows you to use global accounts that are configured on a separate host. |
| | Caution  
Perform this SAPinst option before you start the installation of your SAP system. |
| Additional Application Server Instances | Prerequisites check  
Choose Additional Application Server Instances Prerequisites Check if you want to check your hardware and software requirements before you start the installation.  
Otherwise, SAPinst automatically checks the hardware and software requirements during the installation with the Prerequisite Checker. If any changes are necessary to the SAP system or operating system settings, SAPinst automatically prompts you. For more information, see Running the Prerequisites Checker in Standalone Mode [page 40]. |
| Additional CE Components | Choose this option to install additional CE components, such as  
- Composition Tools  
- Adobe Document Services  
- Composite Voice  
- IDE Update Site |
| SAP Memory Analyzer | Choose this option to install SAP Memory Analyzer. SAP Memory Analyzer helps you to analyze Java heap dumps, easily find big chunks of memory or complex memory aggregation patterns in your data structures and identify who is keeping this memory alive. |
### 4.5 Installing Additional Components (Optional)

You can install the following additional components:

- Composition Tools
- Adobe Document Services
- Composite Voice
- IDE Update Site

**Prerequisites**

You need to fulfill the same hardware and software requirements as for your already installed production system plus an additional 2 GB RAM.

**Note**

Before installing additional components, you need to stop all application servers manually.

Before installing additional components and in the case that you made changes to the default template settings, see SAP Note [953763](#).

**Prerequisites for MaxDB**

Make sure that the Application Server Java and its corresponding database is running.

You can stop and start the system using the shortcuts under Start > All Programs > SAP NetWeaver Composition Environment 7.1 > Application Server Jxx<SAPSID>.

During the installation of additional components, entries are written into the log area of the database. To avoid that the log is running full during the installation, make sure that your backup strategy is already active and an initial data backup was successful.
When you want to establish your backup strategy after installing additional components, you can turn on the special log mode AutoOverwrite using the Database Manager GUI. This interrupts the existing backup history. You have to run a complete backup to start the history again.

**Procedure**

**Note**
When installing from a network share make sure that everyone has read access to this share. The installation routine creates users such as <sid>adm (for example, ce1adm). During the installation SAPinst does a user switch to this user. If the newly created user does not have permissions to the network share where the installation is running from, the installation will fail.

1. Insert the SAP Installation Master DVD into your DVD drive or mount it locally.
2. In the Welcome screen, choose SAP NetWeaver CE Productive System → Software Life-Cycle Options → Additional CE Components → Install Additional Components.
3. Choose whether you want to run the installation in Typical mode or in Custom mode.
   If you select Typical, the installation wizard provides automatic default settings and you only have to respond to a small selection of prompts. The rest is set by default. If you select Custom, you have to respond to all prompts.

**Note**
If you want to install the offline documentation for SAP NetWeaver CE, you need to choose Custom mode.
After the installation, you can access the offline documentation by choosing Start → All Programs → SAP NetWeaver Composition Environment → <SAPSID>.

4. Follow the screens and enter the required parameters.

**Note**
For more information about the input parameters and information about restrictions for passwords, position the cursor on the required parameter and press F1.

After you have entered all requested input parameters, SAPinst displays the Parameter Summary screen. This screen shows both the parameters that you entered and those that SAPinst set by default. If required, you can revise the parameters before starting the installation.

5. To start the installation, choose Start. SAPinst starts the installation and displays the progress of the installation. When the installation has successfully been completed, SAPinst shows the dialog Execution of <Service_Name> has been completed successfully.
4.6 Installing SAP Memory Analyzer (Optional)

SAP Memory Analyzer helps you to analyze Java heap dumps, easily find big chunks of memory or complex memory aggregation patterns in your data structures and identify who is keeping this memory alive. New and innovative analysis techniques support the user with an extremely fast and powerful feature set.

The tool (Eclipse RCP application) was developed to analyze real productive heap dumps, which tend to get enormous in size with hundreds of millions of objects. Performance, low resource consumption and especially the newly developed innovative analysis techniques make it a helpful tool, even to small application heap dumps.

You can install SAP Memory Analyzer as an additional tool.

Procedure

Note

When installing from a network share make sure that everyone has read access to this share. The installation routine creates users such as <sid>adm (for example, ce1adm). During the installation SAPInst does a user switch to this user. If the newly created user does not have permissions to the network share where the installation is running from, the installation will fail.

1. Insert the SAP Installation Master DVD into your DVD drive or mount it locally.
2. 
3. In the Welcome screen, choose SAP NetWeaver CE Productive System ▶ Software Life-Cycle Options ▶ SAP Memory Analyzer ▶ Install SAP Memory Analyzer.
4. Choose whether you want to run the installation in Typical mode or in Custom mode.
   If you select Typical, the installation wizard provides automatic default settings and you only have to respond to a small selection of prompts. The rest is set by default. If you select Custom, you have to respond to all prompts.

Note

If you want to install the offline documentation for SAP NetWeaver CE, you need to choose Custom mode.

After the installation, you can access the offline documentation by choosing Start ▶ All Programs ▶ SAP NetWeaver Composition Environment ▶ <SAPSID>.
5. Follow the screens and enter the required parameters.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>For more information about the input parameters and information about restrictions for passwords, position the cursor on the required parameter and press [F1].</td>
</tr>
</tbody>
</table>

After you have entered all requested input parameters, SAPinst displays the Parameter Summary screen. This screen shows both the parameters that you entered and those that SAPinst set by default. If required, you can revise the parameters before starting the installation.

6. To start the installation, choose Start. SAPinst starts the installation and displays the progress of the installation. When the installation has successfully been completed, SAPinst shows the dialog Execution of <Service_Name> has been completed successfully.
This page is intentionally left blank.
5 Post-Installation

This section includes the post-installation steps that you have to perform for the:

- Standard, distributed or high-availability system
- Additional application server instance
- Host agent as a separate installation

Post-Installation Steps for a Standard, Distributed, or High-Availability System

**Note**
In a standard system, all mandatory instances are installed on one host. Therefore, if you are installing a standard system, you can ignore references to other hosts.

1. If required, you perform a full installation backup [page 113] immediately after the installation has finished.
2. You check whether you can log on to the SAP system [page 94].

**Note**
In a distributed or high-availability system you check whether your can log on to every instance of the SAP system that you installed.

3. You ensure user security [page 104].
4. You install the SAP license [page 95].
   
   Only valid for: HA (UNIX)

5. You set up the licenses for high availability [page 97].
   
   End of: HA (UNIX)

6. You configure the remote connection to SAP support [page 96].
7. If required, you install MaxDB administration tools [page 98].
8. If required, you install Secure Sockets Layer (SSL) for MaxDB [page 100].
9. You back up the MaxDB database [page 104].
10. You update the database software to the current release [page 104].
11. On the primary application server instance host, you apply the latest kernel and Support Packages [page 96].
12. You check the Java manuals [page 109] for information that is relevant for running your Java system.
13. You perform CE-specific post-installation steps [page 110].
14. You perform a full installation backup [page 113].
Post-Installation Steps for an Additional Application Server Instance

1. If required, you perform a full installation backup [page 113] immediately after the installation has finished.
2. You check whether you can log on to the additional application server instance [page 94].
3. You perform a full installation backup of the [page 113].

Post-Installation Steps for the Host Agent as a Separate Installation

You perform the post-installation steps for the Host Agent [page 108].

5.1 Logging On to the Application Server

You need to check that you can log on to the application server using the following standard users:

Java Standalone Users

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: Database</th>
<th>User Name Storage: External ABAP System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>Administrator</td>
<td>You create this user manually during the installation process.</td>
</tr>
</tbody>
</table>

Recommendation
We recommend that you call the user
J2EEADM_<SAPSID_Java_System>
The maximum length is 12 characters.

Prerequisites

- The SAP system is up and running.

Logging On to the Java Application Server

You access AS Java with a URL using a Web browser from your client machines. To log on to the Java application server, proceed as follows:

1. Start a Web browser and enter the following URL:
   \[http://<hostname_of_Java_EE_Engine_Server>:5<Instance_Number>\]

**Note**
You must always enter a two-digit number for \(<Instance_Number>\). For example, do not enter 1 but instead enter 01.
If you installed the SAP NetWeaver Application Server Java on host saphost06 and the instance number of your SAP NetWeaver Application Server Java is 04, enter the following URL:

http://saphost06:50400

The start page of the SAP NetWeaver Application Server Java appears in the Web browser.

2. Log on by pressing the icon of any of the provided applications, for example the SAP NetWeaver Administrator.

### 5.2 Installing the SAP License

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

**Caution**

Before the temporary license expires, you must apply for a permanent license key from SAP. We recommend that you apply for a permanent license key as soon as possible after installing your system.

**Procedure**

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

- [http://help.sap.com](http://help.sap.com) &gt; &lt;your product&gt; &gt; SAP NetWeaver Library &gt; Administrator’s Guide &gt; Technical Operations Manual for SAP NetWeaver (TOM) &gt; General Administration Tasks &gt; License Administration

**More Information**

For more information about SAP license keys and how to obtain them, see SAP Service Marketplace at [http://service.sap.com/licensekey](http://service.sap.com/licensekey).

### 5.3 Configuring the Transport Management System

You have to perform some steps to be able to use the Transport Management System.

**Procedure**

1. Perform post-installation steps for the transport organizer:
   a) Call transaction SE06.
   b) Select **Standard Installation**.
   c) Choose **Perform Post-Installation Actions**.
2. Call transaction STMS in your SAP Solution Manager system to configure the domain controller in the Transport Management System (TMS).

**Result**

You can now perform Java transports in the TMS of your SAP Solution Manager system.

**More Information**

For more information, see the SAP Library at [http://help.sap.com](http://help.sap.com) <your product> » SAP NetWeaver Library » SAP NetWeaver Library: Function-Oriented View » Application Server ABAP » Administration Tools for AS ABAP » Change and Transport System →

---

### 5.4 Configuring the Remote Connection to SAP Support

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

---

### 5.5 Applying the Latest Kernel and Support Packages

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

⚠️ **Caution**

Before you apply support packages, make sure that you read the release notes for your SAP system. You can find these on SAP Service Marketplace at [http://service.sap.com/releasenotes](http://service.sap.com/releasenotes). The release notes might include information about steps you have to perform after you have applied the support packages.

⚠️ **Caution**

Make sure that the entry `DIR CT_RUN` exists in the instance profile. Otherwise you cannot restart the system after patches have been applied.

**Procedure**

5.6 High Availability: Setting Up Licenses

If your high-availability (HA) installation is running a two-node switchover cluster, you need to order two SAP licenses [page 95]. When we receive confirmation from your vendor that you are implementing a switchover environment, we provide two license keys for your system, one key for each machine. You need to order as many licenses as you plan to have cluster nodes running the central services instance. SAP has implemented a license mechanism for transparent and easy use with switchover solutions and clustered environments. Your customer key is calculated on the basis of local information on the message server host. This is the host machine where the central services instance runs.

A switchover involving the central services instance affects the licensing mechanism, so for this case you must have two licenses, which you can install in parallel. There is no license problem when only the database is switched over.

Procedure

1. Run the central services instance on the primary host, node A.
2. To find the hardware key of the primary host, run the SAP NetWeaver Administrator (NWA) on any application server instance and choose Configuration Management ➔ Infrastructure Management ➔ Licenses ➔. The hardware key is displayed in the NWA.
3. Perform a switchover of the central services instance to another node in the cluster and repeat the previous step.
   Repeat this for all remaining nodes in the cluster.
4. To obtain the license keys, enter the hardware keys for the cluster nodes in SAP Service Marketplace at:
   http://service.sap.com/licensekey

For more information, see SAP Note 669669.
5. Open the NWA on any application server instance and choose
   Configuration Management
   Infrastructure Management
   Licenses to import the file containing the licenses to the primary cluster
   node.
6. Perform a switchover to another node in the cluster and repeat the previous step.
   Repeat this for all remaining nodes in the cluster.

Result
The license is no longer a problem during switchover. This means you do not need to call saplicense
in your switchover scripts.

5.7 Installing Administration Tools for MaxDB

This section describes how to install the following administration tools for MaxDB and SAP liveCache
on Windows front ends:

- Database Manager GUI
  You can use Database Manager GUI to administer databases, including remote ones.
- SQL Studio (GUI)
  You can use SQL Studio (GUI) to send SQL statements to the database and evaluate the results.

For more information on these tools, see the following documentation:

- Database Manager GUI
- SQL Studio (GUI)

You can find this documentation as well as information about additional MaxDB tools at:

http://help.sap.com/nw2904s

Prerequisites

- You can install these administration tools on any Windows PC in your network, even if your
database runs on UNIX. From the PC with the installed administration tool, you can then
administer the database or send queries to it.
- Your PC must meet the following minimum operating system requirements:

### Operating System for MaxDB

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows NT</td>
<td>4.0 SP 4</td>
</tr>
<tr>
<td>Windows 2000</td>
<td>Any</td>
</tr>
<tr>
<td>Windows 2003</td>
<td>Any</td>
</tr>
</tbody>
</table>
5.7 Installing Administration Tools for MaxDB

Your PC must meet the following minimum hardware requirements:

- Pentium II
- 64 MB RAM
- 100 MB disk space

You can get the required files from one of the following:

- The MaxDB RDBMS or SAP liveCache DVD
- By downloading from SAP Service Marketplace at:
  - [http://service.sap.com/patches](http://service.sap.com/patches) ➤ Entry by Application Group ➤ Additional Components ➤ MaxDB ➤ MaxDB GUI COMPONENTS/TOOLS ➪

Caution

If MaxDB or liveCache is installed on the PC, you must **not** install the administration tools in the same directory. You can check the directories used by MaxDB or liveCache as follows:

- `dbmcli -d <DBSID> -u <controluser>,<password> dbm_getpath IndepDataPath`
- `dbmcli -d <DBSID> -u <controluser>,<password> dbm_getpath IndepProgPath`

**Procedure**

1. Start the installation as follows:

   - If you are using the **MaxDB RDBMS DVD**:
     - DBMGUI
       - `<DVD>:\MaxDB_Windows_<Processor>\SETUPS\DBM76.EXE`
     - SQL Studio
       - `<DVD>:\MaxDB_Windows_<Processor>\SETUPS\SQLSTD76.EXE`
   
   - If you are using the **liveCache DVD**:
     - DBMGUI
       - `<DVD>:\LC_Windows_<Processor>\SETUPS\DBM76.EXE`
     - SQL Studio
       - `<DVD>:\LC_Windows_<Processor>\SETUPS\SQLSTD76.EXE`

   - If you are using the files from SAP Service Marketplace, simply execute the downloaded .EXE file.

   An installation shield guides you through the installation.

   **Note**

   If you already have an older version of the administration tools installed on the PC, the installation shield offers to upgrade it for you.

2. If you are prompted to restart the PC after the installation, make sure that you first bring down any databases that are running as follows:
5.8 Secure Sockets Layer Protocol for Database Server Communication

The MaxDB database server supports the Secure Sockets Layer (SSL) protocol. You can use this protocol to communicate between the database server and its client, here the Application Server (AS). SSL guarantees encrypted data transfer between the MaxDB database server and its client applications. In addition, the server authenticates itself to the client.

⚠️ Caution
There is a performance cost for SSL since the data has to be encrypted, which requires time and processing power.

To use SSL you need to:

1. Install the SAP cryptographic library on the client host and on the server host machines
2. Generate the Personal Security Environment (PSE) on the server (SSL Server PSE) and on the client (SSL Client PSE).

5.8.1 Installing the SAP Cryptographic Library

The cryptographic functions required to build a database server-client connection using Secure Sockets Layer (SSL) protocol are supplied by the SAP Cryptographic Library. Therefore, you need to install the SAP Cryptographic Library on the host machine of the MaxDB database server and the SAP Application Server (AS).

The installation package sapcrypto.car consists of the following:

- SAP Cryptographic Library libsapcrypto.so
- License ticket ticket
- Configuration tool sapgenpse.exe
  You use the configuration tool to generate key pairs and PSEs.

⚠️ Caution
The SAP Cryptographic Library is subject to German export regulations and might not be available to some customers. In addition, the library might be subject to the local regulations of your country. These regulations might further restrict import, use, and export or re-export of cryptographic software.

For more information, contact your local SAP representative.
Prerequisites
Download the appropriate SAP Cryptographic Library installation package for your operating system from SAP Service Marketplace at http://service.sap.com/swcenter.

Procedure
1. Unpack the installation package for the SAP Cryptographic Library using sapcar.exe, which you can find for example on your Installation Master DVD, using the following command:
   
   car -xvf SAPCRYPTO.CAR

   Note
   The remainder of the procedure, as described below, does not apply to client applications such as SQL Studio, which do not recognize an “independent” directory. In this case, you must copy the SAPCRYPTO installation package to the installation directory of the application. In this directory you need to create a directory sec, into which you copy the ticket file.

2. Copy the sapcrypto library to the lib subdirectory of the “independent program” directory. You can find the value of the independent program directory by entering the following command:

   dbmcli dbm_getpath IndepProgPath

   Example
   The independent program directory might be called the following:
   
   /sapdb/programs/lib

3. Copy the configuration tool sapgenpse.exe to the directory <independent_program>\lib.
4. Create a subdirectory called sec under the “independent data” directory and copy the ticket file into it.

   Example
   The result might look like the following:
   
   /sapdb/data/sec.ticket

5. Make sure that the directory and the files that the sec directory contains – including the ticket file and the SSL Server PSE – belong to the user 1cwn and the group 1cadm, and that the rights are restricted to 0600.

Result
The SAP Cryptographic Library is copied to the application server and the environment is correctly configured so that the server can find the library at run time.
5.8.2 Generating the Personal Security Environment

The information required by the database server or client application to communicate using Secure Sockets Layer are stored in the Personal Security Environment (PSE). The required information differs according to whether SSL PSE is for the server or client:

■ SSL Server PSE
   This PSE contains the security information from the database server, for example, the public-private cryptographic key pair and certificate chain. To install the SSL Server PSE you need to generate the PSE. You can either do this for a single database server or system-wide. The SSL Server PSE is called SDBSSL.exe.

■ SSL Client PSE
   The client requires an anonymous certificate called SDBSSLA.exe, which contains the list of the public keys of trustworthy database servers.

Procedure
To generate the SSL Server PSE, proceed as follows:

Note
You need to know the naming convention for the distinguished name of the database server. The syntax of the distinguished name, which you enter in the procedure below, depends on the Certification Authority (CA) that you are using.

1. Change to the <independent programs>\lib directory.
2. Set up the following environment variable:
   SECUDIR=<independent data>\sec
3. Create an SSL Server PSE, SDBSSL.pse, and generate a certificate request file, certreq, in the directory defined by SECUDIR (see previous step):
   sappgenpse gen_pse -v -r <SECUDIR>\certreq -p SDBSSL.pse "<your distinguished name>"
   For each database server that uses a server-specific PSE, you must set up a unique certificate request. If you are using a valid system-wide SSL Server PSE, you only need to set up a single certificate request for all servers.
4. Send the certificate request to the CA for signing. You can either send it to the SAP CA or to another CA.
   You must make sure that the CA offers a certificate corresponding to the PKCS#7 certificate chain format. Thawte CA at www.thawte.com offers a suitable certificate, either SSL Chained CA Cert or PKCS#7 certificate chain format.
   The CA validates the information contained in the certificate request, according to its own guidelines, and sends a reply containing the public key certificate.
5. After you have received the reply from the CA, make sure that the contents of the certificate request have not been destroyed during download.
For example, if you requested the certificate on a UNIX system and stored it on a Windows front end, the formatting (that is, line indents and line breaks) is affected.

To check the contents, open the certificate request with a text editor (such as Notepad) and repair the line indents and the line breaks.

Example

This is an example of a certificate request:

```
-----BEGIN CERTIFICATE-----
REQUEST-----MIIBPzCBBqQIBADAAMIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQD/302IT+/Y
wpignSw7U9FwneyWz3W1i0S18aFCYkRo00wCpD8UwcaC4dds4uGT6h12W1J0/F0tUg+EQxonZbaRrk9sTalkn1mqx3YA
-----END CERTIFICATE REQUEST-----
```

6. Import the reply to the SSL Server PSE:
   a) Copy the text to a temporary file called srcert.
   b) Enter the following command:

```
sapgenpse import_own_cert -c srcert -p SDBSSL.pse
```

You have generated the SSL Server PSE. You can now start the XServer as usual (if it is already running, you must stop and restart it).

7. To check whether the SSL functionality is working correctly, view the trace file $server_<local computer name>.trace in the <independent data>\wrk directory.

To generate the SSL Client PSE, proceed as follows:

1. Change to the <independent programs>\lib directory.
2. Set up the following environment variable:
   
   ```
   SECUDIR=<independent data>\sec
   ```
3. Enter <independent program>/lib in the environment variable LD_LIBRARY_PATH.
4. Create an anonymous client SSL Client PSE, SDBSSLA.pse in the directory defined by SECUDIR (see previous step):

```
sapgenpse gen_pse -v -noreq -p SDBSSLA.pse
```

You can leave the distinguished name empty.

Before you can establish an SSL connection to a database server, the server certificate must be entered in the PK list of the anonymous client certificate.

5. To see the database server certificate, enter the following command:

```
x_ping -n <servermode> -c[apture]
```

You can check whether to trust the database server certificate. The client certificate is not affected by this.

6. Start the import with this command:

```
x_ping -n <servermode> -i[import]
```

7. To administer the PSE, use the configuration tool sapgenpse. For more information enter the following command:

```
sapgenpse -h
```
5.9 Backing Up the MaxDB Database

You need to define backup media and back up the MaxDB database using Database Manager GUI (DBMGUI).

**Prerequisites**

- You have finished client maintenance.
- You have installed Database Manager GUI [page 98].
- You can find more information on backing up the database at:
  - [http://help.sap.com/nw70](http://help.sap.com/nw70) SAP NetWeaver Library SAP NetWeaver by Key Capability Application Platform by Key Capability Platform-Wide Services Databases MaxDB Tools Database Manager GUI Backup

**Procedure**

1. Define the backup medium as described in Managing the Backup Media in the above documentation.
2. Back up the database as described in Backing Procedures in the above documentation.

5.10 Updating the Database Software to the Current Release

After the installation and before you start production operation, we strongly recommend you to update the database software.

**Procedure**

1. Download the latest MaxDB patches as follows:
   - [http://service.sap.com/swdc](http://service.sap.com/swdc) Download Database Patches MaxDB
   - For more information about upgrading to a MaxDB Support Package, see SAP Note 73598.

5.11 Ensuring User Security

You need to ensure the security of the users that SAPinst creates during the installation. For security reasons, you also need to copy the installation directory to a separate, secure location — such as a DVD — and then delete the installation directory.
In all cases, the user ID and password are only encoded when transported across the network. Therefore, we recommend using encryption at the network layer, either by using the Secure Sockets Layer (SSL) protocol for HTTP connections, or Secure Network Communications (SNC) for the SAP protocols dialog and RFC.

For more information, see the SAP Library at:

http://help.sap.com <your product> SAP NetWeaver Library SAP NetWeaver Library:
Function-Oriented View Security Network and Transport Layer Security

⚠️ Caution

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

Prerequisites

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

Procedure

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

<table>
<thead>
<tr>
<th>User Type</th>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system user</td>
<td>sqd&lt;dbsid&gt;</td>
<td>MaxDB database administrator (that is, the owner of the database files)</td>
</tr>
<tr>
<td>MaxDB database users</td>
<td>SAP&lt;SAPSID&gt;DB</td>
<td>MaxDB database owner (that is, the owner of the database tables)</td>
</tr>
<tr>
<td></td>
<td>CONTROL</td>
<td>MaxDB database manager operator</td>
</tr>
<tr>
<td></td>
<td>SUPERDBA</td>
<td>MaxDB database system administrator</td>
</tr>
<tr>
<td>Operating system user</td>
<td>&lt;sapsid&gt;adm</td>
<td>SAP system administrator</td>
</tr>
</tbody>
</table>
Host Agent User

<table>
<thead>
<tr>
<th>User</th>
<th>User Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system user</td>
<td>sapadm</td>
<td>SAP system administrator You do not need to change the password of this user after the installation. This user is for administration purposes only.</td>
</tr>
</tbody>
</table>

**Note**

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

- With the users stored in an external ABAP system – see the first table below
- With the users stored in the database – see the second table below

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

SAP System Users Stored in an External ABAP System

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: External ABAP System</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>You create this user manually in the external ABAP system during the installation process.</td>
<td>This user’s password is stored in secure storage. Therefore, whenever you change the administrator’s password, you must also change the password in secure storage with the Config Tool. For more information, see Checking the SAP Java Documentation [page 109].</td>
</tr>
<tr>
<td>Guest</td>
<td>You create this user manually in the external ABAP system during the installation process.</td>
<td>Lock this user for interactive logon.</td>
</tr>
<tr>
<td>Communication user for Application Server Java</td>
<td>You create this user manually in the external ABAP system during the installation process.</td>
<td>Specify this user as a Communications user and not as a dialog user. This user exists at least in the SAP system client that you specified during the installation.</td>
</tr>
</tbody>
</table>
### User Name Storage: External ABAP System

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: External ABAP System</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users for Adobe Document Services (ADS)</td>
<td>ADSUSER</td>
<td>User exists at least in the clients 000 and 001 of the external ABAP system. You must have created this user manually in the external ABAP system before you started the installation. For more information, see Preparing User Management for an External ABAP System [page 56].</td>
</tr>
<tr>
<td></td>
<td>ADS_AGENT</td>
<td>User exists at least in the clients 000 and 001 of the external ABAP system. You must have created this user manually in the external ABAP system before you started the installation. For more information, see Preparing User Management for an External ABAP System [page 56].</td>
</tr>
<tr>
<td>Data supplier user for System Landscape Directory (SLD) (optional)</td>
<td>The name that you gave this user when you created it manually [page 56]. The recommended name is SLDDSUSER.</td>
<td>User exists at least in the clients 000 and 001 of the external ABAP system</td>
</tr>
<tr>
<td>ABAP API user for System Landscape Directory (SLD) (optional)</td>
<td>The name that you gave this user when you created it manually [page 56]. The recommended name is SLDAPIUSER.</td>
<td>User exists at least in the clients 000 and 001 of the external ABAP system</td>
</tr>
</tbody>
</table>

### SAP System Users Stored in the Database

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: Database</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>The name that you gave this user during the installation or the default name Administrator</td>
<td>This user’s password is stored in secure storage. Therefore, whenever you change the administrator’s password, you must also change the password in secure storage with the AS Java Config Tool. For more information, see Checking the SAP Java Documentation [page 109].</td>
</tr>
<tr>
<td>Guest</td>
<td>The name that you gave this user during the installation or the default name Guest</td>
<td>Lock this user for interactive logon.</td>
</tr>
</tbody>
</table>
5.12 Post-Installation Steps for the Host Agent

You have to perform the following steps on each host where the host agent is installed. This applies whether the host agent is installed on a host within the SAP system or separately on another host.

**Procedure**

1. You check whether the installed services are available as follows:
   a) Log on as user `sapadm`.
   b) Check whether the following services are available:
      - The control program `saphostexec`
      - The operating system collector `saposcol`
      - The SAP NetWeaver Management agent `SAPHostControl` (`sapstartsrv` in host mode)

   ![Note]
   When the host is booted, the startup script `sapinit` automatically starts the required executables.

2. You configure the host agent according to your requirements.

**More Information**

For more information, see the SAP Library at:
5.13 Checking the SAP Java Documentation

Here you can find information in the SAP Library about the configuration of Application Server Java (AS Java) and about SAP Java technology.

Procedure

1. Go to the following place in the documentation:

2. Check the following documentation for information relevant to running your Java system:

<table>
<thead>
<tr>
<th>Manual</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture Manual</td>
<td>This manual describes the architecture of a Java or ABAP+Java system. It contains information on:</td>
</tr>
<tr>
<td></td>
<td>- Java cluster architecture including central services, <strong>load balancing</strong>, and <strong>high availability</strong>.</td>
</tr>
<tr>
<td></td>
<td>- Application Server Java (AS Java) system architecture</td>
</tr>
<tr>
<td></td>
<td>- SAP NetWeaver <strong>Java development infrastructure</strong>, including <strong>SAP NetWeaver Developer Studio</strong></td>
</tr>
</tbody>
</table>

**Note**

The SAP NetWeaver Developer Studio is the SAP development infrastructure for Java. The Architecture Manual describes the integration of the SAP NetWeaver Developer Studio into the SAP development infrastructure.

<table>
<thead>
<tr>
<th>Administration Manual</th>
<th>This manual describes how to administer the SAP system, focusing on AS Java. It contains information on:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- System landscape administration</td>
</tr>
<tr>
<td></td>
<td>- Software life-cycle management</td>
</tr>
</tbody>
</table>

**Note**

This part of the manual contains important information about:                                                                 |
- Installation information                                                                                                 |
- System Landscape Directory (SLD)                                                                                         |
- Software Lifecycle Manager (SLM)                                                                                         |
- Java Support Package Manager                                                                                             |
- Administration of SAP NetWeaver Java Development Infrastructure (JDI)                                                     |
- AS Java and AS Java security
### More Information

For troubleshooting AS Java, see the J2EE Engine Problem Analysis Guide at:


### 5.14 CE-Specific Post-Installation Activities

This section describes the steps that you have to perform after the installation has finished successfully.

#### Running the Configuration Wizard (Optional)

**Note**

You can run the configuration wizard only once and only directly after installing and patching your SAP system.

After SAPinst has finished, run the configuration wizard to apply automated configuration tasks to your system.

For SAP NetWeaver CE, you need to run the following configuration tasks, depending on the installed components:

- **Configuration of Services Registry Webservice Destinations**
- **Configuration and Mirroring of local NWDS Update Site**
- **Initial setup ADS in CE**

For more information about how to start the configuration wizard, see the configuration documentation in the SAP Solution Manager.
Enabling Adobe Document Services

If you have installed SAP NetWeaver Composition Environment with the Adobe Document Services add-on a Windows platform, you must complete the following post-installation steps to enable the add-on. In case you have installed an AS Java cluster, apply the procedure to the central host, as well as to all hosts where additional application server instances are running.

1. Using the SAP Management Console, stop the AS Java system.
2. From the Start menu, open Control Panel  Administrative Tools  Computer Management  Services and Applications  Services.
3. Select SAP<SID>_<Instance_Number> (for example, SAPCE1_00) and open Properties from the context menu.
4. On the Log On tab page, enable the Local System account indicator.
5. Repeat the above steps for the second SAP<SID>_<Instance_Number> service that you see in the list.
6. Start the AS Java system.

Adobe LiveCycle Designer

For more information about how to install and configure the Adobe LiveCycle Designer see SAP Note 962763.

Enabling Services Registry

You must apply additional configuration steps to enable Services Registry after you have installed an SAP NetWeaver Composition Environment system containing the following components:

- Java Application Server and Composition Platform
- Java Application Server and Adobe Document Services

To enable Services Registry, you must apply the following configuration template to your system:

CE_Complete_Stack_production_full

Note

For more information about what configuration templates are available, see Configuration Templates [page 119].

See also
Developing and Composing Applications Consuming Enterprise Services Searching for Services Services Registry Tasks Searching & Browsing Service Definitions Configuring the Services Registry

Configuring the Portal in SAP NetWeaver CE
After installing the portal in SAP NetWeaver CE, a number of deactivated or irrelevant tools are displayed in the UI. To display the correct portals tools for CE, proceed as follows:

1. Open a browser and log on to your portal as an administrator.
2. In the same browser session, enter the following URL:
   where <host> is the host name of your server and <httpport> is the port number of your server.
3. In the Portal Mode Configuration Tool, choose Activate Development Mode to restore the portal tools and content that are assigned to the development mode.
4. Restart or refresh your browser.
5. In the SAP Management Console, restart the server.

You may then continue with the mandatory and optional configuration steps as described in
Configuration of SAP NetWeaver Composition Environment Configuration for CE Additional Components Configuring the Portal.

Changing the Password for the Internet Communication Manager (ICM)
You can monitor and manage the Internet Communication Manager (ICM) from the command line program.
After the installation of your SAP NetWeaver CE system has successfully finished, you need to change the ICM password manually. To do so, proceed as follows:

1. Log on at operating system level to the computer where the ICM is running.
2. Start the program icmon with icmon -a profile=<instance_profile> to maintain the authentication file (default: authfile.txt).
3. Choose a to add a user.
4. Choose c to change the password of the existing user.
5. Choose s to save your settings.

Further Configuration Steps
After installing your SAP NetWeaver CE system and performing the post-installation steps to get the system up & running, you may need to perform further configuration steps.
Refer to the following documentation to proceed with your tasks:
If you are a system administrator, refer to [http://help.sap.com/nwce](http://help.sap.com/nwce) Administrator's Guide. It contains information about how to configure and administer your system.

If you are a developer, refer to [http://help.sap.com/nwce](http://help.sap.com/nwce) Developer's Guide. It provides guidelines for developing applications using the SAP NetWeaver CE.

Note
The SAP NetWeaver CE documentation is also available offline as a part of your installation. To access it, choose Start ➤ All Programs ➤ SAP NetWeaver ➤ Composition Environment 1.0 ➤ Documentation.

5.15 Performing a Full Installation Backup

You must perform a full offline backup after the configuration of your SAP system. If required, you can also perform a full offline backup after the installation (recommended). In addition, we recommend you to regularly back up your database.

Caution
Make sure that you fully back up your database so that you can recover it later if necessary.

You need to back up the following directories and files:

- All SAP-specific directories:
  - `/usr/sap/<SAPSID>`
  - `<sapmnt>/<SAPSID>`
  - Home directory of the user `<sapid>adm`

- All database-specific directories

- The root file system
  This saves the structure of the system and all configuration files, such as file system size, logical volume manager configuration, and database configuration data.

Note
This list is only valid for a standard installation.

Prerequisites

- You have logged on [page 94](#) as user `<sapid>adm` and stopped the SAP system and database [page 128].

This procedure works on all hardware platforms. For more information on operating system-specific backup procedures, see your operating system documentation.
Back Up the Installation

1. Log on as user root.
2. Manually create a compressed tar archive that contains all installed files:
   - Saving to tape:
     ```
     tar -cf <file_system> | compress -c > <tape_device>
     ```
   - Saving to the file system:
     ```
     tar -cf <file_system> | compress -c > ARCHIVENAME.tar.Z
     ```

Restoring Your Backup

If required, you can restore the data that you previously backed up.

⚠️ Caution

Check for modifications in the existing parameter files before you overwrite them when restoring the backup.

1. Log on as user root.
2. Execute the following commands to
   - restore the data from tape:
     ```
     cat <tape_device> | compress -cd | tar -xf -
     ```
   - restore the data from the file system:
     ```
     cat ARCHIVENAME.tar.Z | compress -cd | tar -xf -
     ```
6 Updating SAP NetWeaver Composition Environment

If you want to apply the latest support packages and patches to your SAP NetWeaver CE system or update your applications, use the update management service of SAP NetWeaver CE.

**Before You Start the Update**

- During the update process, entries are written to the log areas of the database. To avoid that the log is running full during the update, make sure that you backup scenario is working well or the *Automatic LogOverwrite* is enabled.
- Before you start the update, apply SAP Note 1088002. You need to perform this once on each system.

**Updating Your SAP NetWeaver CE System Manually**

If you have a system that was installed with SP0 or SP1, proceed as follows:

   
   Search for `SERVERCORE01_0-10004571.SCA SP01` for *J2EE ENGINE SERVERCORE 7.05*.
   
   Before deploying the SCA using telnet, change the permissions using the following command:
   ```
   chmod 777 SERVERCORE01_0-10004571.SCA
   ```
   
   For more information, see SAP Note 1073329.

2. Manually deploy the three XI third-party SDAs using telnet.
   
   For more information, see SAP Note 1088386.

3. Exchange the engine template.

   **Note**

   Before changing the current template, note down the name of the currently active template. You will need it at the end of the update procedure to reactivate the original template again.

   a) Navigate to the `configtool` subdirectory of your installation directory, for example
   ```
   C:\usr\sap\CE1\J01\j2ee\configtool
   ```
   b) Run the file `configtool.bat`.
   c) Highlight the file and choose `File > Change System Template`.
   d) Switch from the current template to the `instance_development` template.
   e) Save your settings and restart the server.

   To do this, open SAP Management Console, select the node and choose the restart option.
Caution
If you are running a cluster system, you need to check that all instances are running the correct template before proceeding to update the main instance.

4. Download the update files from \http://service.sap.com/swdc\ Download \Support Packages and Patches\ Entry by Application Group \SAP NetWeaver\ SAP NETWEAVER \SAP NETWEAVER CE 7.1 \Support Package Stacks\.
5. Stop the SAP Management Console.
6. Log on to your system as user root and, from the download folder from SAP Service Marketplace, run the update tool update<ID>.sh to apply patches and updates to your SAP NetWeaver CE system.
   After running the update tool wait until the engine is fully started.
7. To complete the update process, change back the system template to the original one.

Caution
If you are running a cluster system, make sure that you change back to the original template on all dialog instances.

8. Restart the system.

Update Management Service
Update Management Service is intended to help automate the process of downloading and installing the latest Support Package Stack from SAP Service Marketplace. The Update Management tool will connect to SAP Service Marketplace and look for the latest support package stack available for your system. For example, if your system is on SP3 and the latest support package available is SP5, the Update Management Service will download and apply SP5 to your system. If, however, you want to go to an intermediate support package stack, you have to download the stack manually.

Procedure
1. Start the Update Management tool as user <sid>adm from the following path:
   /usr/sap/<SID>/SYS/exe/uc/<PLATFORM>/ceupdatemangement
2. Follow the on-screen instructions and enter the required logon information.
3. The Update Management tool checks the system for installed components and support package stack level.
4. The Update Management tool checks for updates and new support package stacks on SAP Service Marketplace and applies them automatically.

When the update has successfully completed, SAPinst shows the dialog The system is up-to-date.
7 Additional Information

The following section provides additional information about the installation of SAP NetWeaver Composition Environment.

7.1 Transporting Self-Developed Software Component Archives (SCA) into the System

Prerequisites
You have developed your own Software Component Archives (SCA) and want to transport them into your SAP NetWeaver CE system.

Procedure
To transport your SCAs to the SAP NetWeaver CE system, proceed as follows:

1. Run the update tool as described in Updating the SAP NetWeaver CE system [page 115].

   ![Note]
   If the tool displays descriptions such as Applying Support Packages, you can ignore them.

2. In the dialog screens, specify the directory where your SCAs are located.
3. Follow the on-screen instructions.

7.2 Troubleshooting – Repairing an Inconsistent MaxDB Installation

Prerequisites
During the preinstallation phase, the installation tools checks the Microsoft Windows registry for already installed MaxDB software. If the registry key is found but there is no software on the hard drive, you receive the following message:

The existing MaxDB software is not consistent. Check the file system and registry. The most common reason for this inconsistency is the manual deletion of the software from the file system without using the specified tools.
Procedure
To repair this inconsistency, proceed as follows:

2. Make sure the services SAPDBWWW, SAPDB: *, and XServer are stopped.
3. Choose Start Run and run the command regedit.
4. Go to My Computer\HKEY_LOCAL_MACHINE\SOFTWARE\SAP\SAP DBTech Key IndepPrograms.
   The key contains a path to a folder.
   a) Check if this folder exists on the file system.
   b) Note down the value of Key IndepPrograms for later usage (see step 7).
      If the path does not exist in the file system, delete the key SAP DBTech.
5. Delete the following keys:
   - My Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\SAP DBTech-*
   - My Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\SAPDBWWW
   - My Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\XServer
7. Delete the following paths from the variable:
   - <IndepPrograms>/bin
   - <IndepPrograms>/pgm
8. Reboot your computer.

7.3 Restarting the MaxDB Server Manually
If, after a reboot, the database server is not running automatically, you need to restart the MaxDB server manually.

Production Systems
To restart the MaxDB server manually, proceed as follows:

1. Open a command prompt and enter the following command: net start sapdbwww
   OR
   Choose Start All Programs Administrative Tools Services. Double-click on SAP DB WWW and choose Start.
2. Open the SAP Management Console and choose SAP Systems SAPSID machine name.
3. Enter the master password and choose Logon.
4. Choose Online. When the database server is online, you can restart the engine.

Development Systems
To restart the MaxDB server manually, choose Start All Programs SAP NetWeaver Composition Environment CE Application Server SAPSID Start Application Server.
7.4 Restarting the MS SQL Server Manually

If, after a reboot, the database server is not running automatically, you need to restart the MS SQL Server manually.

Procedure
1. Choose [Start] [All Programs] [Administrative Tools] [Services].
2. Look for the service named SQL Server <name>, where <name> is MSSQLSERVER for the default instance or <instance name> for a named instance.
3. If the service status is not started, right-click the service and choose Start in the context menu.
4. To insure the service is started automatically after each system restart, right-click it and choose Properties. Select Automatic as the startup type.

7.5 Configuration Templates

Configuration templates contain the predefined instance configuration for specific scenarios. They are automatically applied according to the installation option you have selected. The templates are designed to optimize system performance by applying certain configuration to the Java Virtual Machine and the application server, as well as by applying startup filters to AS Java services and applications to start only those relevant for the selected installation options. The following table provides information about the available templates with SAP NetWeaver Composition Environment. In the template name, replace the <system_mode> parameter by development (for the templates relevant to systems installed in development mode) or production (for the templates relevant to systems installed in productive mode).

<table>
<thead>
<tr>
<th>Configuration Template</th>
<th>Selected Installation Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE_Java EE &lt;system_mode&gt;._full</td>
<td>Java Application Server Installation</td>
</tr>
<tr>
<td>CE_Composition_Environment_&lt;system_mode&gt;._full</td>
<td>Java Application Server Installation + Composition Platform Installation</td>
</tr>
<tr>
<td>CE_Adobe_Document_Service_&lt;system_mode&gt;._full</td>
<td>Java Application Server Installation + Adobe Document Services Add-on Installation</td>
</tr>
<tr>
<td>CE_Composite_Voice_&lt;system_mode&gt;._full</td>
<td>Java Application Server Installation + Voice Add-on Installation</td>
</tr>
<tr>
<td>CE_Complete_Stack_&lt;system_mode&gt;._full</td>
<td>Java Application Server Installation + Composition Platform Installation + Adobe Document Services Add-on Installation + Voice Add-on Installation</td>
</tr>
</tbody>
</table>
If your selection cannot be mapped to one of the combinations in the above table, the template `CE_Complete_Stack_<system_mode>_full` is applied. It starts all applications and services needed to run the complete stack.

You can manually apply a different configuration template if you want to switch to another installation option. For example, by changing from template `CE_Complete_Stack_<system_mode>_full` to `CE_Java EE_<system_mode>_full`, you achieve shorter startup times and less memory consumption, but also less functionality since not all applications and services are running.


Make sure that you do not apply a development template to a productive system or vice versa.

### 7.6 Mounting a CD / DVD for AIX

You can use this procedure to mount a CD or DVD.

**Note**

`<medium-mountdir>` refers to either `<cd-mountdir>` or `<dvd-mountdir>`.

#### Procedure

1. Log on as user `root`.
2. Add a CD / DVD file system.
   a) Enter the command `smitty`.
   c) To get a list of device names, choose `[F4]`. Select a device name.
   d) Enter the mount point `<medium-mountdir>`.
      
      **Example**
      
      `<medium-mountdir>` is `/sapcd`
      
   e) Choose `ENTER`.
   f) To exit `smitty`, choose `[F10]`.
3. Mount the CD / DVD as follows:
Note
Alternatively, you can mount the CD / DVD manually with the following command: `mount -v cdrfs -r /dev/cd0 /sapcd`.

a) Enter the command `smitty`.
b) Choose ▶️ Physical & Logical Storage ▶️ File Systems ▶️ Mount a File System ▶️.
c) Place the cursor on File System Name and choose [F4].
d) Select the CD / DVD device `/dev/cd0`.
e) Place the cursor on field Directory over which to mount and choose [F4].
f) Select `/sapcd`.
g) Place the cursor on field Type of File System and choose [F4].
h) Select `cdrfs`.
i) Change Mount as Read Only system to YES
j) Choose [ENTER].
k) To exit `smitty`, choose [F10].

### 7.7 Additional Information About SAPinst

The following sections provide additional information about SAPinst [page 79]:

- [Interrupted Installation with SAPinst](#)
- [Performing a Remote Installation with SAPinst (Optional)](#)
- [Starting SAPinst GUI Separately (Optional)](#)
- [Entries in the Services File Created by SAPinst](#)
- [Troubleshooting with SAPinst](#)

### 7.7.1 Interrupted Installation with SAPinst

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

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

The following table describes the options in the dialog box:
### Option Definitions

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

### Note
You can also terminate SAPinst by choosing `Ctrl` + `C`. However, we do not recommend that you use `Ctrl` + `C` because this kills the process immediately.

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

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

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

2. Mount your Installation Master DVD.

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

3. Enter the following commands:
   ```
   cd <Installation_Master_DVD>/IM_<OS>
   ./sapinst
   ```

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

4. GUI

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

The What do you want to do? screen appears.

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

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run a new Installation</td>
<td>SAPInst does not continue the interrupted installation. Instead, it moves</td>
</tr>
<tr>
<td></td>
<td>the content of the old installation directory and all installation-specific</td>
</tr>
<tr>
<td></td>
<td>files to the backup directory. Afterwards, you can no longer continue the</td>
</tr>
<tr>
<td></td>
<td>old installation. For the backup directory, the following naming convention</td>
</tr>
<tr>
<td></td>
<td>is used: &lt;log_day_month_year_hours_minutes_seconds&gt; (for example,</td>
</tr>
<tr>
<td>Continue old installation</td>
<td>SAPInst continues the interrupted installation from the point of failure.</td>
</tr>
</tbody>
</table>

7.7.2 Performing a Remote Installation with SAPInst (Optional)

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

Prerequisites

- The remote host meets the prerequisites before starting SAPInst [page 79].
- Both computers are in the same network and can "ping" each other.
  To test this:
  - Log on to your remote host and enter the command ping <local host>.
  - Log on to the local host and enter the command ping <remote host>.

Procedure

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

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

2. Mount the Installation Master DVD.
3. Enter the following commands:
   cd <Installation_Master_DVD>/IM_<OS>
.sapinst -nogui
For more information, see Running SAPinst [page 79].
SAPinst now starts and waits for the connection to the SAPinst GUI. You see the following at
the command prompt:
guiengine: No GUI connected; waiting for a connection on host <host_name>, port
<port_number> to continue with the installation.
4. Start SAPinst GUI on your local host, as described in Starting SAPinst GUI Separately [page 124].
5. Log on to your remote host as user root.

Caution
Make sure that the root user has not set any environment variables for a different SAP system or
database.
6. Mount the Installation Master DVD.
7. Enter the following commands:
cd <Installation_Master_DVD>/IM_<OS>
./sapinst -nogui
For more information, see Running SAPinst [page 79].
SAPinst now starts and waits for the connection to the SAPinst GUI. You see the following at
the command prompt:
guiengine: No GUI connected; waiting for a connection on host <host_name>, port
<port_number> to continue with the installation.
8. Start SAPinst GUI on your local host, as described in Starting SAPinst GUI Separately [page 124].

7.7.3 Starting SAPinst GUI Separately (Optional)

You use this procedure to start SAPinst GUI separately. You might need to start SAPinst GUI
separately in the following cases:
- You have logged off from SAPinst.
  If you logged off during the installation and you later want to reconnect to the installation while it
  is still running, you can start SAPinst GUI separately.
- You want to perform a remote installation [page 123].
  If SAPinst GUI runs on a different host from SAPinst and the GUI server, you have to start SAPinst
  GUI separately.

Starting SAPinst GUI on a Windows Platform

1. Log on as a member of the local administrators group.
2. Insert the SAP Installation Master DVD into your DVD drive.
3. Change to the directory of the sapinst executables:
4. Start SAPinst GUI by double-clicking `sapinstgui.exe`

SAPinst GUI starts and tries to connect to the GUI server and SAPinst, using the local host as default.

If SAPinst and the GUI server are running on another host, SAPinst GUI cannot connect and the *SAP Installation GUI Connection* dialog appears.

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

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

- **Note**
  Optionally you can start `sapinstgui.exe` with the following parameters:
  - `host=<host name>`, where `<host name>` is the host name of the installation host
  - `port=<nr>`, where `<nr>` is the port number for the connection to the GUI server
  - `-accessible` enables the Accessibility mode

Example:

```
./sapinstgui.exe host=lsi1209 port=3000 -accessible
```

### Starting SAPinst GUI on a UNIX Platform

1. Log on as user root.

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

2. Mount your Installation Master DVD.

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

3. Change to the directory of the `sапinst` executables:

```
<Installation_Master_DVD>/DATA_UNITS/IM_<OS>_<DB>
```

7.7 Additional Information About SAPinst

**Note**
If you want to start SAPinst GUI on a Linux 32–bit platform, change to the following directory:
<Installation_Master_DVD>/DATA_UNITS/SAPINSTGUI_710_LINUX_I386

4. Start SAPinst GUI by executing `/sapinstgui`
SAPinst GUI starts and tries to connect to the GUI server and SAPinst, using the local host as default.
If SAPinst and the GUI server are running on another host, SAPinst GUI cannot connect and the SAP Installation GUI Connection dialog appears.
In this case, enter the name of the host on which SAPinst is running and choose Log on.
The first dialog of the installation appears and you can perform the remote installation from your local host.

**Note**
Optionally you can start `sapinstgui` with the following parameters:
- `host=<host name>`, where `<host name>` is the host name of the installation host
- `port=<nr>`, where `<nr>` is the port number for the connection to the GUI server
- `- accessible` enables accessibility mode
Example:
`./sapinstgui host=lsi1209 port=3000 -accessible`

### 7.7.4 Entries in the Services File Created by SAPinst

After the installation has finished successfully, SAPinst has created the following entries in `/etc/services`:
- `sapdpXX = 32XX/tcp`
- `sapdbXXs = 47XX/tcp`
- `sapgwXX = 33XX/tcp`
- `sapgwXXs = 48XX/tcp`
where `XX` is set from 00 to 99.

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

### 7.7.5 Troubleshooting with SAPinst

This section tells you how to proceed when errors occur during the installation with SAPinst.
If an error occurs, SAPinst:
7.8 Heterogeneous SAP System Installation

This section provides information on how to install an SAP system in a heterogeneous system landscape. “Heterogeneous system landscape” means that application servers run on different operating systems and / or database systems.

**Note**

See SAP Note [1067221](#) for information on

- supported combinations of operating systems and database systems
- installing an application server on Windows in a heterogeneous (UNIX) SAP system environment (ABAP, Java, or ABAP+Java) with SAPinst.
- Java EE engine installation on heterogeneous architectures
- heterogeneous Unix - Unix Systems

The following procedure describes how to install SAP instances in a heterogeneous UNIX environment, which is where you run instances on different UNIX platforms.

**Procedure**

1. Install the central services instance, the primary application server instance, and the database as described in this installation guide.
2. Log on as user **root** on the additional application server instance host.
3. On the SAP Global host (High Availability: Switchover Cluster Infrastructure), export the following directories:
   - `<sapmnt>/<SAPSID>/exe`
   - `<sapmnt>/<SAPSID>/global`
   - `<sapmnt>/<SAPSID>/profile`

4. Mount the directories listed in the previous step on each additional application server instance host as described in *Preparing the installation DVDs* [page 72].

5. Mount the CD or DVD drive using NFS and insert the CD / DVD with the SAP executables on the additional application server instance host.

6. Install the additional application server instance as described in this installation guide.

### 7.9 Starting and Stopping the SAP System

You want to check that you can start and stop your SAP system using one of the following:

- *The SAP Management Console (SAP MC)* [page 128]
- *The startsap and stopsap scripts* [page 131]

#### 7.9.1 Starting and Stopping the SAP System Using the SAP Management Console

You can start and stop all instances of your SAP system using the SAP Management Console (SAP MC).

**Note**

If your newly installed SAP system is part of a heterogeneous SAP system landscape that comprises systems or instances on Windows platforms, you can also start and stop it from a Windows system or instance using the Microsoft Management Console (MMC). For more information about handling the MMC, see:


**Prerequisites**

- Make sure that the host on which you start SAP MC meets the following requirements:
  - Java Runtime Environment (JRE) 5.0 is installed.
  - The browser supports Java.
  - The browser’s Java plug-in is installed and activated.
- You have logged on to the host as user `<sapid>adm`. 
Starting the Web-Based SAP Management Console

1. Start a Web browser and enter the following URL:
   \[http://<hostname>:5<instance_number>13\]

   **Example**

   If the instance number is 53 and the host name is saphost06, you enter the following URL:
   \[http://saphost06:55313\]

   This starts the SAP MC Java applet.

   **Note**

   If your browser displays a security warning message, choose the option that indicates that you trust the applet.

2. Choose **Start**.

   The SAP Management Console appears.

   By default, the instances installed on the host you have connected to are already added in the SAP Management Console. If you want to change the configuration to display systems and instances on other hosts, see *Registering Systems and Instances* below.

Starting and Stopping Systems and Instances

Starting an SAP System or Instance

1. In the navigation pane, open the tree structure and navigate to the system node that you want to start.
2. Select the system or instance and then, from the context menu, choose **Start**.
3. In the Start SAP System(s) dialog box, choose the required options.
4. Choose **OK**. The SAP MC starts the specified system or system instances.

   **Note**

   The system may prompt you for the SAP system administrator credentials. To complete the operation, you must have administration permissions. Log in as user \(<\text{sapsid}>\text{adm}\)."
Stopping an SAP System or Instance

1. Select the system or instance you want to stop and choose *Stop* from the context menu.
2. In the *Stop SAP System(s)* dialog box, choose the required options.
3. Choose *OK*. The SAP MC stops the specified system or system instances.

**Note**
The system may prompt you for the SAP system administrator credentials. To complete the operation, you must have administration permissions. Log in as user `<sapsid>adm`.

Similarly, you can start, stop or restart all SAP systems and individual instances registered in the SAP MC.

Stopping Instances Separately

If you need to stop the instances of an SAP system separately, for example when you want to start a distributed or a high-availability system, proceed in the following sequence:

1. Stop application server instance(s) J<Instance_Number>.
2. Stop the central services instance SCS<Instance_Number>.
3. Stop the database instance.

**Registering Systems and Instances in the SAP Management Console**

You can extend the list of systems and instances displayed in the SAP MC, so that you can monitor and administer all systems and instances from a single console. You can configure the SAP MC startup view to display the set of systems and instances you want to manage.

**Prerequisites**
The SAP MC is started.

**Registering SAP Systems**

1. In the SAP MC, choose **File ➤ New**.
2. In the *New System* dialog box, enter the required data.

**Note**
If you have already registered systems in the SAP MC, they are stored in the history. To open the *System’s History* dialog box, choose the browsing button next to the *Instance Nr.* field. Select an instance of the system that you want to add and choose *OK*.

3. Choose *Finish*.

**Registering Individual Instances**

1. In the SAP MC, choose **File ➤ New**.
2. In the New System dialog box, enter the required data and deselect Always show all SAP Instances.
3. The SAP MC displays the SAP system node, the instance node and the relevant database node in a tree view in the navigation pane.

**Note**

To view all instances of the respective SAP system, select the relevant system node and choose *Add Application Server* from the context menu.

### Configuring the SAP MC View

- You can choose the instances that the SAP MC displays automatically on startup:
  1. In the Settings dialog box, select *History*.
  2. In the right-hand side pane, choose the instance you want the SAP MC to display on startup.
  3. Choose the << button.
  4. Choose *Apply* and then choose *OK*.

Similarly, you can remove instances from the startup configuration.

- You can save the current configuration in a file:
  1. Choose [File] > *Save Landscape*.
  2. In the *Save dialog* box, enter the required data.
  3. Choose *Save*.

- You can load a configuration from a file:
  2. In the *Open* dialog box, select the configuration you want to load.
  3. Choose *Open*.

### More Information

For more information about how to handle the SAP MC, see the SAP Library at:


### 7.9.2 Starting and Stopping the SAP System Using Scripts

You can start and stop the SAP system by running the *startsap* and *stop.sap* scripts.

**Prerequisites**

- You have checked the default profile `/<sapmnt>/<SAPSID>/profile/DEFAULT.PFL` for parameter *login/system_client* and set the value to the correct productive system client. For example, the entry must be *login/system_client = 001* if your productive client is 001.
- You have logged on to the SAP system hosts as user `<sapid>adm`. 

11/05/2007
For more information about how to start or stop database-specific tools, see the database-specific information in this documentation and the documentation from the database manufacturer.

If you want to use \texttt{startsap} or \texttt{stopsap} (for example, in a script) and require the fully qualified name of these SAP scripts, create a link to \texttt{startsap} or \texttt{stopsap} in the home directory of the corresponding user.

\section*{Caution}

If there are multiple SAP instances on one host — for example, a primary application server instance and an additional application server instance — you must add an extra parameter to the scripts:

\begin{itemize}
  \item \texttt{startsap <instanceID>}
  \item \texttt{stopsap <instanceID>}
\end{itemize}

For example, enter:

\begin{itemize}
  \item \texttt{startsap J00}
\end{itemize}

\section*{Note}

The instance name (instance ID) of the primary application server instance is \texttt{J<Instance	extunderscore Number>}, the instance name of the central services instance is \texttt{SCS<Instance	extunderscore Number>}, and the instance name of a Java additional application server instance is \texttt{J<Instance	extunderscore Number>}.

\begin{itemize}
  \item Only valid for: HA (UNIX)
\end{itemize}

In a high-availability system you must use the failover cluster software of your hardware vendor to start or stop all instances that are running on the switchover cluster.

You can only use \texttt{startsap} and \texttt{stopsap} scripts for instances that are not running on the switchover cluster.

\section*{Procedure}

Starting the SAP system

\begin{itemize}
  \item To start all instances on the standard system host, enter the following command:
    \begin{itemize}
      \item \texttt{startsap}
    \end{itemize}

   This checks if the database is already running. If not, it starts the database first.
Note
You can start the database and SAP system separately by entering the following commands:

```
startdb
startsap DB
startsap R3 <instance ID of central services instance>
startsap R3 <instance ID of primary application server instance>
startsap R3 <instance ID of additional application server instance>
```

Make sure that you always start the database first because otherwise the other instances cannot start.

Note
You can also use the parameter J2EE, which is a synonym for the parameter R3.
For ABAP+Java systems, you can enter either the command `startsap R3` or `startsap J2EE` to start the SAP instance comprising both ABAP and Java.

- **In a distributed system**, proceed as follows:
  1. On the host running the database instance, enter:
     ```
     startdb
     ```
  2. On the host running the central services instance, enter:
     ```
     startsap
     ```
  3. On the host running the primary application server instance, enter:
     ```
     startsap
     ```
  4. For additional application server instance(s), enter the following on the relevant host:
     ```
     startsap R3 <instance ID of additional application server instance>
     ```

Note
Make sure that the SAP system is up and running before you start or restart additional application server instances.

- **In a high-availability system**, proceed as follows:

  Note
  In the following example, only the central services instance is running on the switchover cluster.

  1. On the database host, enter:
     ```
     startdb
     ```
  2. On the switchover cluster infrastructure, use the failover cluster software to start the central services instance.
  3. On the host of the primary application server instance, enter:
     ```
     startsap
     ```
  4. For additional application server instance(s), enter the following on the relevant host:
     ```
     startsap R3 <instance ID of additional application server instance>
     ```
Note
Make sure that the SAP system is up and running before you start or restart additional application server instances.

For an additional application server instance, enter the following on the relevant host:

```
startsap R3 <instance ID of additional application server instance>
```

Note
Make sure that the SAP system is up and running before you start or restart additional application server instances.

Stopping the SAP System

Note
When you use `stopsap` in a Multiple Components in One Database (MCOD) system with two primary application server instances, only one primary application server 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.

For more information, see Installation of Multiple Components in one Database [page 25].

If you have a standard system, enter the following to stop all instances on the standard system host:

```
stopsap
```
This stops the primary application server instance, central services instance, and database.

Note
You can stop the database and SAP system separately by entering the following commands:

```
stopsap R3 <instance ID of additional application server instance>
stopsap R3 <instance ID of primary application server instance>
stopsap R3 <instance ID of central services instance>
stopsap DB
```
Make sure that you always stop the primary application server instance first and the central services instance second because otherwise the database cannot be stopped.

Note
You can also use the parameter J2EE, which is a synonym for the parameter R3. For ABAP+Java systems, you can enter either the command `stopsap R3` or `stopsap J2EE` to stop the SAP instance comprising both ABAP and Java.

In a distributed system, proceed as follows:
1. On the host(s) running the additional application server instance(s), enter the following command:
   ```bash
   stopsap <instance ID of additional application server instance>
   ```
2. On the host running the primary application server instance, enter:
   ```bash
   stopsap
   ```
3. On the host running the central services instance, enter:
   ```bash
   stopsap
   ```
4. On the host running the database instance, enter:
   ```bash
   stopdb
   ```

   In a **high-availability system**, proceed as follows:

   ![Note]
   In the following example, only the central services instance is running on the switchover cluster.

   1. On the host(s) running the additional application server instance(s), enter the following command:
      ```bash
      stopsap <instance ID of additional application server instance>
      ```
   2. On the host running the primary application server instance, enter:
      ```bash
      stopsap
      ```
   3. On the switchover cluster infrastructure, use the failover cluster software to start the central services instance.
   4. On the host running the database instance, enter:
      ```bash
      stopdb
      ```

   ![For an additional application server instance]
   For an **additional application server instance**, enter the following on the relevant host:
   ```bash
   stopsap R3 <instance ID of additional application server instance>
   ```

   ![Note]
   Make sure that the SAP system is up and running before you start or restart additional application server instances.

   ![Caution]
   Make sure that no SAP instance is running before you enter **stopdb** on a standalone database server. No automatic check is made.
7.10 High Availability: Finalizing the Enqueue Replication Server

You have to perform this procedure only if you have installed the enqueue replication server (ERS) into an existing system. This is necessary to ensure correct functioning of the ERS, which depends on the switchover software you are using.

Procedure

1. Restart the central services instance associated with the ERS. This requires you to restart the primary application server (PAS) and additional application server instance (AAS).
2. Contact your hardware partner to configure and test the ERS.

More Information

help.sap.com > SAP NetWeaver Library > SAP NetWeaver: Function-Oriented Overview > Application Server Infrastructure > Standalone Enqueue Server > Installing the Standalone Enqueue Server

7.11 Uninstalling SAP NetWeaver Composition Environment

You have to uninstall all components of the SAP NetWeaver Composition Environment separately. You can uninstall your SAP NetWeaver CE system in different ways.

Uninstalling SAP NetWeaver CE

Start the uninstallation from the directory `/usr/sap/SID/SYS/exe/uc/<platform>/uninstall`.

Uninstalling SAP NetWeaver CE Using SAPinst

1. Insert the SAP Installation Master DVD into your DVD drive or mount it locally.
2. Start SAPinst from the SAP Installation Master DVD as described in the section `Installing SAP NetWeaver Composition Environment`.
3. In the `Welcome` screen, choose `Uninstall SAP System or Single Instances` from the tree structure.
4. Follow the on-screen instructions.
7.12 Deleting an SAP System

This section describes how to delete a single instance, a standalone engine or a complete SAP system with the Uninstall option of SAPinst.

Caution

- You cannot delete an SAP system remotely.
- 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.

Prerequisites

- This description assumes that you have installed your SAP system with standard SAP tools according to the installation documentation.
- You are logged on as user root.
- If the saposco1 process on the host where you are working has been started from the SAP system that you want to delete, stop the process using the command saposco1 -k.
  If there are other SAP systems on the host, log on as user <sapsid>adm of the other SAP system and start saposco1 from there using the command saposco1 -1.

Procedure

1. Start SAPinst and on the Welcome screen, choose:
   - <SAP System> > Software Life-Cycle Options > Uninstall > Uninstall – SAP systems or single instances.
2. Follow the instructions in the SAPinst input dialogs.

Note

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

SAPinst first asks you which SAP instances you want to delete. Make sure that you delete the SAP instances in the order as described hereinafter.

- If you want to delete a standard system (all instances reside on the same host), you can do this in one SAPinst run.
- If you want to delete a distributed system, you have to run SAPinst to delete the required instances locally on each of the hosts belonging to the SAP system in the following sequence:
  a) Additional application server instance(s), if there are any
b) Database instance

**Caution**

SAPinst only stops local instances automatically. Before you delete the database instance of a distributed system make sure that you stop all remaining instances. You must stop the instance with the message server only after having entered all SAPinst parameters for the deletion of the database instance.

Choose whether you want to drop the entire database or only one or more database schemas. If you drop the entire database, SAPinst also asks whether you want to remove the database software.

c) Primary application server instance
d) Central services instance

**Note**

To delete system directories mounted from an NFS server, make sure that you run SAPinst on the NFS server.

3. If required, you can delete the directory `/usr/sap/trans` and its content manually.

SAPinst does not delete `/usr/sap/trans` because it might be shared.
# Typographic Conventions

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