

Software Provisioning Manager 1.0
Document Version: 2.5 – 2016-10-07

Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.1 to 7.5 on UNIX : Oracle



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Document History

i Note

Before you start the implementation, make sure you have the latest version of this document, which is available at <https://support.sap.com/sltoolset>   [System Provisioning](#) .

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

Table 1:

Version	Date	Description
2.5	2016-10-07	Updated version for software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18) <ul style="list-style-type: none"> New Features: <ul style="list-style-type: none"> Option to choose installing an integrated SAP Web Dispatcher during the ASCS instance installation, documented in: ASCS Instance with Integrated SAP Web Dispatcher [page 24]. Oracle Multitenant Installation, documented in: Oracle Database 12c Multitenant Database Installation [page 182] Using RMOSSWPM*.SAR instead of SWPM*.SAR for outdated OS versions not supported by SAP kernel 7.40 and higher, documented in:  Introduction  Constraints 
2.4	2016-06-06	Updated version for software provisioning manager 1.0 SP17 (SL Toolset 1.0 SP17): <ul style="list-style-type: none"> New Features: <ul style="list-style-type: none"> " Archive-Based Installation", documented in: <ul style="list-style-type: none"> New Features [page 11] Preparing the Installation Media [page 88]   Downloading Specific Installation Archives (Archive-Based Installation) 
2.3	2016-02-15	Updated version for software provisioning manager 1.0 SP10 (SL Toolset 1.0 SP16)
2.21	2015-10-29	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)
2.2	2015-10-12	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)
2.1	2015-09-14	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)
2.0	2015-04-27	Updated version for software provisioning manager 1.0 SP08 (SL Toolset 1.0 SP13)
1.9	2014-11-24	Updated version for software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
1.8	2014-09-24	Updated version for software provisioning manager 1.0 SP06 (SL Toolset 1.0 SP11) Updates for migration to SAP HANA database added

Version	Date	Description
1.7	2014-07-07	Updated version for software provisioning manager 1.0 SP06 (SL Toolset 1.0 SP11) Instead of a separate installation guide for each UNIX-based operating system, we now deliver a single installation guide for all UNIX-based operating systems. Sections that are only relevant for one or more specific operating systems are highlighted accordingly.
1.6	2014-03-17	Updated version for software provisioning manager 1.0 SP05 (SL Toolset 1.0 SP10)
1.5	2013-10-28	Updated version
1.4	2013-07-15	Updated version
1.3	2013-04-02	Updated version
1.2	2012-11-27	Updated version
1.1	2012-09-25	Updated version
1.0	2012-08-06	Initial version

1 Introduction

1.1 About this Document

This installation guide describes how to install an SAP system based on the application server **ABAP** using the installation tool Software Provisioning Manager 1.0 SP18 (“installer” for short), which is part of SL Toolset 1.0 SP18.

This guide is valid for the operating systems AIX, HP-UX, Linux, and Solaris, and covers the SAP system products and releases listed in SAP Note [1680045](#).

For information about supported operating system and database platforms for the SAP product you want to install, see the Product Availability Matrix at <http://support.sap.com/pam>.

Caution

Make sure you have read [Before You Start \[page 9\]](#) before you continue with this installation guide.

1.2 Naming Conventions

- Software Provisioning Manager is the successor of the product- and release-specific delivery of provisioning tools, such as SAPinst.
Before you perform an installation or system copy, we recommend that you always download the latest version of the Software Provisioning Manager which is part of the Software Logistics Toolset (SL Toolset for short). For more information, see [Preparing the Installation Media \[page 88\]](#).
This way, you automatically get the latest SAPinst version including latest fixes in the tool and supported processes. For more information about Software Provisioning Manager as well as products and releases supported by it, see SAP Note [1680045](#) and <http://scn.sap.com/docs/DOC-30236>.
As a result, SAPinst has been renamed to Software Provisioning Manager (installer for short) in this documentation.
However, the term “SAPinst” is still used in:
 - Texts and screen elements in the Software Provisioning Manager GUI
 - Naming of executables, for example `sapinst`
 - Naming of command line parameters, for example `SAPINST_USE_HOSTNAME`
 - Operating system user groups, for example additional group `sapinst`
- “usage type”, “technical usage”, and “product instance”
As of Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12), the term “product instance” replaces the terms “usage type” and “technical usage” for SAP systems based on SAP NetWeaver 7.3 including enhancement package 1 and higher. For more information, see SAP Note [1970349](#). Note that there is no terminology change for older releases and all mentioned terms can be used as synonyms. As this guide is a

generic document, the currently used terms remain but only "product instance" is going to be used from now on when referring to SAP NetWeaver 7.3 EHP1 and higher.

For more information, see [New Features \[page 11\]](#).

- "installer" refers to "Software Provisioning Manager 1.0".
- "SAP system" refers to SAP system based on the application server of SAP NetWeaver Mobile / Banking 7.1 / 7.1 including Enhancement Package 1 / SAP NetWeaver 7.3 / 7.3 including Enhancement Package 1 / SAP NetWeaver Application Server for ABAP 7.4 / SAP NetWeaver 7.4 / SAP NetWeaver 7.5.
- "ABAP system" refers to SAP system based on the application server ABAP of SAP NetWeaver Mobile / Banking 7.1 / 7.1 including Enhancement Package 1 / SAP NetWeaver 7.3 / 7.3 including Enhancement Package 1 / SAP NetWeaver Application Server for ABAP 7.4 / SAP NetWeaver 7.4 / 7.4 SR1.
- "Diagnostics Agent" refers to the SAP Solution Manager Diagnostics Agent which is the remote component of End-to-End Root Cause Analysis. It allows having a connection between SAP Solution Manager and managed systems, and then to collect information from the managed systems for reporting purposes.

1.3 Constraints

-  **Caution**

SAP is going to restrict maintenance for operating system versions that have been initially released with SAP kernel 7.2<x> but are no longer supported for SAP kernel 7.40 and higher. The following Software Provisioning Manager operating system versions are affected:

- Only valid for 'Platform': Linux
LINUX ON IA32 32BIT
End of 'Platform': Linux
- Only valid for 'Platform': Linux
LINUX ON IA64 64BIT
End of 'Platform': Linux
- Only valid for 'Platform': Linux
LINUX ON X86_64 64BIT: SLES9, SLES10, SLES11 (<SP2), RHEL4, RHEL5, ORACLE5
End of 'Platform': Linux
- Only valid for 'Platform': HP-UX
HP-UX ON PA-RISC 64BIT
End of 'Platform': HP-UX
- Only valid for 'Platform': HP-UX
IHP-UX ON IA64 64BIT: < 11.31
End of 'Platform': HP-UX
- Only valid for 'Platform': AIX
AIX 64BIT: < 6.0
End of 'Platform': AIX
- Only valid for 'Platform': Oracle Solaris
SOLARIS ON SPARC 64BIT: < 10 aka 5.10
End of 'Platform': Oracle Solaris

With the release of Software Provisioning Manager 1.0 SPS 18, the `SWPM*.SAR` archive will stop working on the above listed outdated operating system versions.

Instead of using the `SWPM*.SAR` archive, you must use the `RMOSSWPM*.SAR` archive for these outdated operating system versions.

Keep in mind that the `RMOSSWPM*.SAR` archive will not receive improvements in the future. SAP maintenance for `RMOSSWPM*.SAR` will be finally stopped by the end of 2017.

SAP recommends upgrading the operating system to a more recent version and using `RMOSSWPM*.SAR` to export from existing SAP systems.

- The Dual Stack option, which integrates an AS ABAP and AS Java in a single system (common System ID `<SAPSID>`, common startup framework, common database), is no longer supported in SAP systems based on SAP NetWeaver 7.5. So if you want to install a new SAP NetWeaver 7.5 Process Integration (PI) system which is based on SAP NetWeaver 7.5, do not use the documentation *Installation Guide - SAP Systems Based on the Application Server ABAP+Java of SAP NetWeaver on <OS>: <DB>*. Instead, use the *Installation Guide - SAP Systems Based on the Application Server ABAP of SAP NetWeaver on <OS>: <DB>* to install the ABAP stack with its own `<SAPSID>` and the *Installation Guide - SAP Systems Based on the Application Server Java of SAP NetWeaver on <OS>: <DB>* to install the Java stack with its own `<SAPSID>`. For more information, see the implementation sequence in the *Master Guide - SAP NetWeaver 7.5* at <http://help.sap.com/netweaver> ►► `<Release>` ► *Installation and Upgrade Information* ►.
- Not all SAP NetWeaver releases or SAP Business Suite applications that are available in Software Provisioning Manager 1.0 and are described in this installation guide have already been released. Always check SAP Note [1680045](#) to ensure that the installation options you want to perform are already supported. For information about supported operating system and database platforms, see the Product Availability Matrix at <http://support.sap.com/pam>.
- Note that a complete system installation from scratch is not available for every product. For some products - such as SAP NetWeaver 7.4 - a complete new system installation from scratch is only provided for the highest support release. If there are one or more support releases, then a complete system installation is only available for the highest of these support releases. As for the lower support releases, only options for system copy and additional application server instances are provided.
- Your operating system platform must be **64-bit**.
- The `startsap` and `stopsap` commands have been deprecated. For more information and for information on alternatives, see [Starting and Stopping SAP System Instances Using Commands \[page 196\]](#).
- Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5. For more information, see SAP Note [1749142](#).

1.4 Before You Start

Make sure that you have read the Master Guide for your SAP NetWeaver application and release before you continue with this installation guide.

The Master Guide is the central document leading you through the overall implementation process for your SAP system installation. It contains crucial information about the overall implementation sequence, that is activities you have to perform before and after the installation process described in this installation guide.

You can find a printed version of the Master Guide in your installation package or you can download the latest version from SAP Service Marketplace.

The following table lists the Master Guides of the SAP system applications for which you can use this installation guide, along with the available quick link or path to the appropriate download location:

Table 2:

Document	Internet Address
Master Guide – SAP for Banking Release 5.0 or 6.0	http://help.sap.com/bankingservices ▶▶ <Release> ▶ Installation and Upgrade Information ▶
Master Guide - SAP NetWeaver Mobile 7.1	http://help.sap.com/nwmobile71 ▶▶ Installation and Upgrade Information ▶
Master Guide – SAP NetWeaver 7.3	http://help.sap.com/nw73 ▶▶ Installation and Upgrade Information ▶
Master Guide – SAP Enhancement Package 1 for SAP NetWeaver 7.3	http://help.sap.com/nw731 ▶▶ Installation and Upgrade Information ▶
Master Guide – SAP NetWeaver 7.4	http://help.sap.com/nw74 ▶▶ Installation and Upgrade Information ▶
Master Guide – SAP NetWeaver 7.5	http://help.sap.com/nw75 ▶▶ Installation and Upgrade Information ▶
Master Guide - SAP Enhancement Package <Number> for SAP ERP 6.0	http://help.sap.com/erp ▶▶ <Release> ▶ Installation and Upgrade Information ▶
Master Guide (Including Upgrade Information) - SAP Supplier Relationship Management 7.0 <Including SAP Enhancement Package <Number>	http://help.sap.com/srm ▶▶ <Release> ▶ Installation and Upgrade Information ▶
Master Guide (Including Upgrade Information) - SAP Customer Relationship Management 7.0 <Including SAP Enhancement Package <Number>	http://help.sap.com/crm ▶▶ <Release> ▶ Installation and Upgrade Information ▶
Master Guide SAP Supply Chain Management 7.0 <Including SAP Enhancement Package <Number> Powered by SAP NetWeaver	http://help.sap.com/scm ▶▶ <Release> ▶ Installation and Upgrade Information ▶
Master Guide – SAP Solution Manager 7.2	http://help.sap.com/solutionmanager72 ▶▶ Installation and Upgrade Information ▶







1.5 New Features

The table below provides an overview of the new features in Software Provisioning Manager.

Make sure that you also read the release notes for your SAP product at <http://help.sap.com> >> <Product Area> > <Product> > <Release> > *What's New – Release Notes* >.

Table 3:

Feature	Description	Availability
Oracle Multitenant Installation	<p>The multitenant option introduced in Oracle Database 12c allows a single container database (CDB) to host multiple separate pluggable databases (PDB). In the Software Provisioning Manager you can create a CDB, PDB, and also a new pluggable database in an existing container database.</p> <p>For more information, see Oracle Database 12c Multitenant Database Installation [page 182].</p>	Software Provisioning Manager 1.0 SP18 (SL Toolset 1.0 SP18)
Option to install an SAP Web Dispatcher in an ASCS instance	<p>You can now install an SAP Web Dispatcher in an ASCS instance. You can choose this option while running the ASCS instance installation.</p> <p>For more information, see ASCS Instance with Integrated SAP Web Dispatcher [page 24]</p>	Software Provisioning Manager 1.0 SP18 (SL Toolset 1.0 SP18)
Archive-Based Installation	<p>You can now download the specifically required installation archives instead of the complete SAP kernel installation media. For more information, see section <i>Downloading Specific Installation Archives (Archive-Based Installation)</i> in Preparing the Installation Media [page 88] .</p>	Software Provisioning Manager 1.0 SP17 (SL Toolset 1.0 SP17)
Diagnostics Agent	<p>The Diagnostics Agent is no longer installed automatically with the SAP system. The <i>Install Diagnostics Agent</i> check box on the <i>Install Diagnostics Agent</i> screen is no longer available.</p> <p>You now have to install the Diagnostics Agent always separately. We recommend that you install it prior to the installation of your SAP system(s).</p> <p>For more information, see the Diagnostics Agent Installation Strategy attached to SAP Note 1365123 , to SAP Note 1833501 , and to SAP Note 1858920 and the attached <i>Diagnostics Agent Setup Guide</i>.</p>	Software Provisioning Manager 1.0 SP10 (SL Toolset 1.0 SP16)

Feature	Description	Availability
System Provisioning for SAP NetWeaver 7.5 and SAP NetWeaver 7.5-based Products	<p>All system provisioning tasks (installation, system copy, system rename) are available for the new SAP NetWeaver 7.5 release.</p> <p>The Dual Stack option, which integrates an AS ABAP and AS Java in a single system (common System ID <SAPSID>, common startup framework, common database), is no longer supported in SAP systems based on SAP NetWeaver 7.5.</p> <ul style="list-style-type: none"> After upgrading to SAP NetWeaver 7.5 PI, you first have to split the still existing dual stack-system before you can use SAP NetWeaver 7.5 PI productively. For more information, see the <i>Upgrade Master Guide - SAP NetWeaver 7.5</i> at: http://help.sap.com/nw75  <i>Installation and Upgrade Information</i>  SAP NetWeaver 7.5 is Unicode only The primary application server instance directory has been renamed from <code>/usr/sap/<SAPSID>/DVEBMGS<Instance_Number></code> to <code>/usr/sap/<SAPSID>/D<Instance_Number></code>. For more information, see SAP Directories [page 75]. Declustering and depooling of tables during the installation is enabled by default. For more information, see SAP Note 1892354 . 	Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP15)
System Provisioning for SAP Solution Manager 7.2	All system provisioning tasks (installation, system copy, system rename) are available for the new SAP Solution Manager 7.2 release. Compared to previous SAP Solution Manager releases, SAP Solution Manager 7.2 is no longer provided as a classical dual-stack system (ABAP system with Java Add-in), but consists of a separate ABAP and Java stack.	Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP15)
Creating Kernel Archives from existing SAP System	You can reuse the binaries of a dedicated SAP system for a new SAP system installation or target system installation in the context of a system copy by creating <code>*.SAR</code> archives based on the <code>*.lst</code> files from the executable (<code>exe</code>) directories of the source SAP system. For more information, see Creating Kernel Archives from an Existing SAP System [page 95] .	Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP14)
Support of Oracle 12 Database	You can now perform all Software Provisioning Manager 1.0 tasks (installation, system copy, system rename) for SAP systems with the Oracle 12 database. For more information, see http://support.sap.com/pam  .	Software Provisioning Manager 1.0 SP08 (SL Toolset 1.0 SP13)
Usage Type Library Deprecation for SAP Systems Based on SAP NetWeaver 7.3 EHP1 and Higher	Software Provisioning Manager 1.0 no longer uses the "Usage Types" definitions in its business logic for SAP systems based on SAP NetWeaver 7.3 EHP1 and higher. This is done to unify modeling and terminology across all SAP tools used during the planning, installation and maintenance activities. The "Product Instance" definition replaces "Usage Types" regarding product modeling. For more information, see SAP Notes 1970349  and 1877731  .	Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)

Feature	Description	Availability
Installation Using a Stack Configuration File	You can start the installer using a stack configuration file generated by the Maintenance Planner. The configuration parameters in this file can then be used by the installer to improve the integration with SUM and to simplify the process of installation for a new system on target software level. For more information, see Installation Using a Stack Configuration File (Optional) [page 30] .	Software Provisioning Manager 1.0 SPO7 (SL Toolset 1.0 SP12)
Adaptive Installation	You can assign virtual host names to SAP system instances during the input phase of the installation directly on the screens where you define the instance parameters.	Software Provisioning Manager 1.0 SPO7 (SL Toolset 1.0 SP12)
Feedback Evaluation Form	SAP SE's aim is to provide fast and efficient procedures. To evaluate the procedure you just carried out, we need information generated by the tool during process execution and your experience with the tool itself. A new evaluation form contains a simple questionnaire and XML data generated during the procedure. Port 4239 is used for displaying the feedback evaluation form. For more information, see the <i>Prerequisites</i> section in Running the Installer [page 110] .	Software Provisioning Manager 1.0 SPO7 (SL Toolset 1.0 SP12)
Option Verify Signed Media	The digital signature ensures that the signatory of a digital document can be identified unambiguously and signatory's name is documented together with the signed document, the date, and the time. For more information, see SAP Note 1979965 .	Software Provisioning Manager 1.0 SPO6 (SL Toolset 1.0 SP11)



1.6 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 at <http://support.sap.com/notes>.

Table 4: SAP Notes for the Installation

SAP Note Number	Title	Description
1680045	Release Note for Software Provisioning Manager 1.0	Software Provisioning Manager 1.0 with installation and system copy for SAP NetWeaver-based systems
1704753	Inst. Systems Based on SAP NetWeaver on UNIX	UNIX-specific information about the installation for SAP systems and corrections to this documentation

SAP Note Number	Title	Description
2172935 	Installation - SAP Systems based on SAP NetWeaver on UNIX/Windows : Oracle	Oracle-specific information about the SAP system installation and corrections to this documentation
1431800 	Oracle 11.2.0: Central Technical Note	Information about Oracle 11g with multiple links to notes on Oracle 11g
1914631 	Central Technical Note for Oracle Database 12c Release 1 (12.1)	Information about Oracle 12c with multiple links to notes on Oracle 12c.
98252 	Installing two Oracle databases on a host	This SAP Note is only required if you plan to install more than one Oracle database on the same host
73606 	Supported Languages and Code Pages	Information on possible languages and language combinations in SAP systems
1972803 	SAP on AIX: Recommendations	This SAP Note contains recommendations and clarifications for many topics relevant for SAP on AIX.
1075118 	SAP on HP-UX: FAQ	This SAP Note contains information that is specific to the SAP system installation on HP-UX
171356 	171356 - SAP Software on Linux: General information	This SAP Note contains Linux-specific information about the SAP system installation
1669684 	SAP on Oracle Solaris 11	This SAP Note contains information and references to SAP Notes relevant for Solaris 11
1067221 	Composite SAP Note for heterogeneous installation	This SAP Note and its related SAP Notes describe the released operating system and database combinations for heterogeneous SAP systems landscapes.
789220 	Support Package levels for SAP NetWeaver installations/upgrades	Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP NetWeaver release
819722 	Support Package levels for SRM installations/upgrades	Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP SRM release
774615 	Support Package levels of ERP/ECC installations/upgrades	Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP ERP release
837413 	Support Package levels for CRM installations/upgrades	Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP CRM release

SAP Note Number	Title	Description
850038 	Support Package levels for SCM/APO installations/upgrades	Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP SCM release
1990240 	Support of mixed landscapes (Unicode and Non-Unicode)	Temporarily your system landscape is mixed with Unicode and Non-Unicode systems. You have third party software in your system landscape which does not support Unicode at all. You wonder whether such a heterogeneous system landscape is supported without restrictions.

2 Installation Options Covered by this Guide

This section shows the installation options covered by this installation guide. You have to decide what exactly you want to install because the steps you have to perform vary according to the installation option you choose.

- [Standard system \[page 16\]](#) (formerly known as central system)
- [Distributed system \[page 17\]](#)
- Only valid for 'High Availability': HA (UNIX)
[High-availability system \[page 18\]](#)

End of 'High Availability': HA (UNIX)
- You can install one or more [additional application server instances \[page 20\]](#) to an existing standard, distributed, or high-availability system.
- You can [split off an ABAP central services instance from an existing primary application server instance \[page 23\]](#) of an upgraded system.
- You can install an [SAP Host Agent separately \[page 26\]](#).

After you decide on the installation option that you want to use, continue with [Planning \[page 28\]](#).

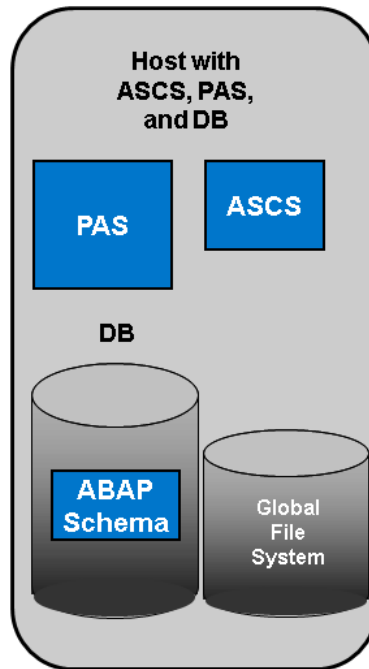
2.1 Standard System

You can install a **standard** system on a **single** host.

In a standard system, all main instances run on a single host.

There are the following instances:

- ABAP Central services instance (ASCS instance)
Optionally you can install the ASCS instance with an integrated SAP Web Dispatcher. For more information, see [ASCS Instance with Integrated SAP Web Dispatcher \[page 24\]](#).
- Database instance (DB)
- Primary application server instance (PAS instance)



ASCS = ABAP Central Services Instance
PAS = Primary Application Server Instance
DB = Database Instance

Figure 1: Standard ABAP System

2.2 Distributed System

You can install a system distributed over several hosts.

An SAP system consists of SAP instances. An SAP instance is a group of processes that are started and stopped at the same time.

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

- ABAP Central services instance (ASCS instance)
Optionally, you can install the ASCS instance with an integrated SAP Web Dispatcher. For more information, see [ASCS Instance with Integrated SAP Web Dispatcher \[page 24\]](#).
- Database instance (DB)
The ABAP stack uses its own database schema in the database.
- Primary application server instance (PAS)

The graphics below assume that you use the global directories of the ASCS instance as global file system. That means that the host with the ASCS instance is the SAP global host. However, you can also separately install the global directories on any host of your SAP system landscape.

You can also use the SAP transport host or the host with the global file system (SAP global host) as your primary application server instance host.

Optionally, you can install one or more additional application server instances. For more information, see [Installation of an Additional Application Server Instance \[page 20\]](#).

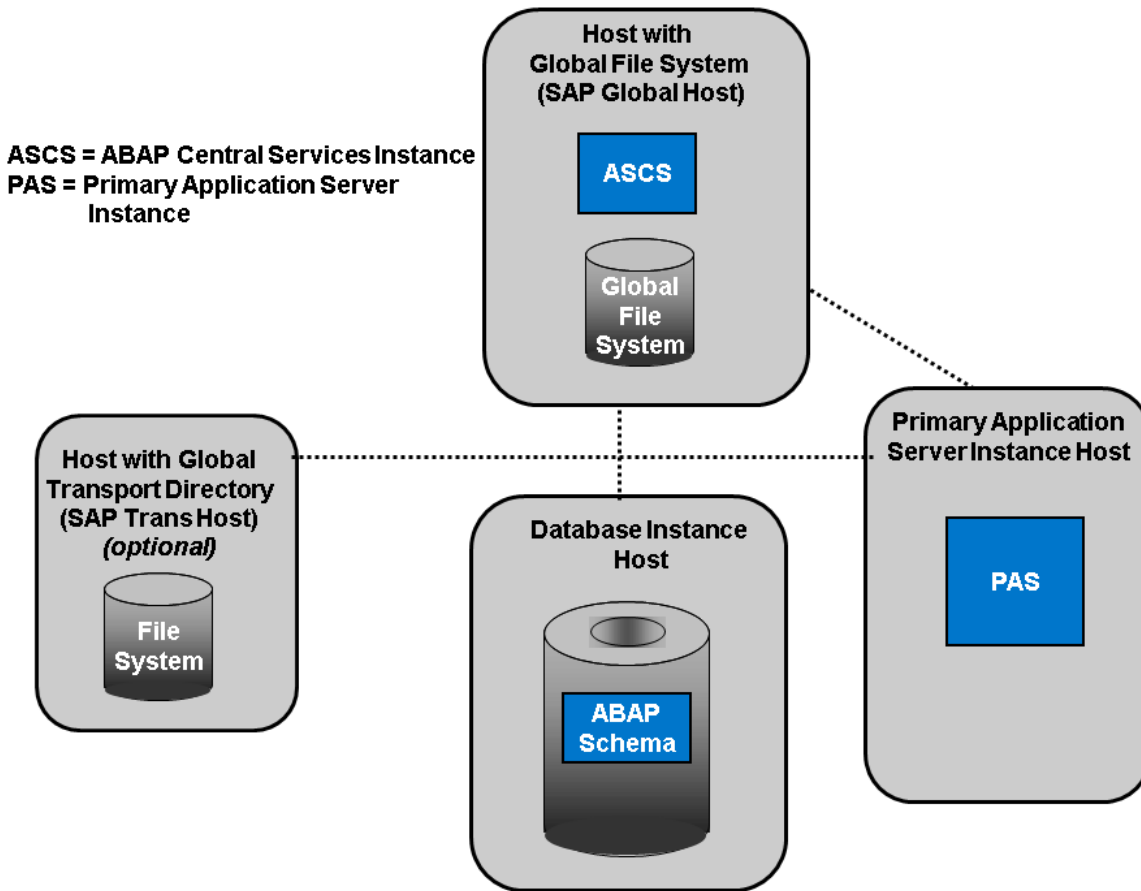


Figure 2: Distributed ABAP System

2.3 High-Availability System

This topic is only valid for 'High Availability': HA (UNIX)

An SAP system consists of SAP instances. An SAP instance is a group of processes that are started and stopped at the same time.

In a **high-availability** system, every instance can run on a separate host.

There are the following instances:

- ABAP Central services instance (ASCS instance)
 Optionally you can install the ASCS instance with an integrated SAP Web Dispatcher. For more information, see [ASCS Instance with Integrated SAP Web Dispatcher \[page 24\]](#).
- Enqueue replication server instance (ERS instance) for the ASCS instance (mandatory)
- Database instance (DB)
- Primary application server instance (PAS)

The graphics below assume that you run the ASCS instance on the switchover cluster infrastructure. However, you can also run other SAP system instances that are a single point of failure (SPOF) on a switchover cluster infrastructure, for example the database instance.

You can also use the SAP transport host or the host with the global file system (SAP global host) as your primary application server instance host.

We recommend that you run the ASCS instance in a switchover cluster infrastructure. The ASCS instance must have its own ERS instance.

To increase high availability by creating redundancy, we recommend that you install additional application server instances on hosts different from the primary application server instance host. For more information, see [Installation of an Additional Application Server Instance \[page 20\]](#).

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

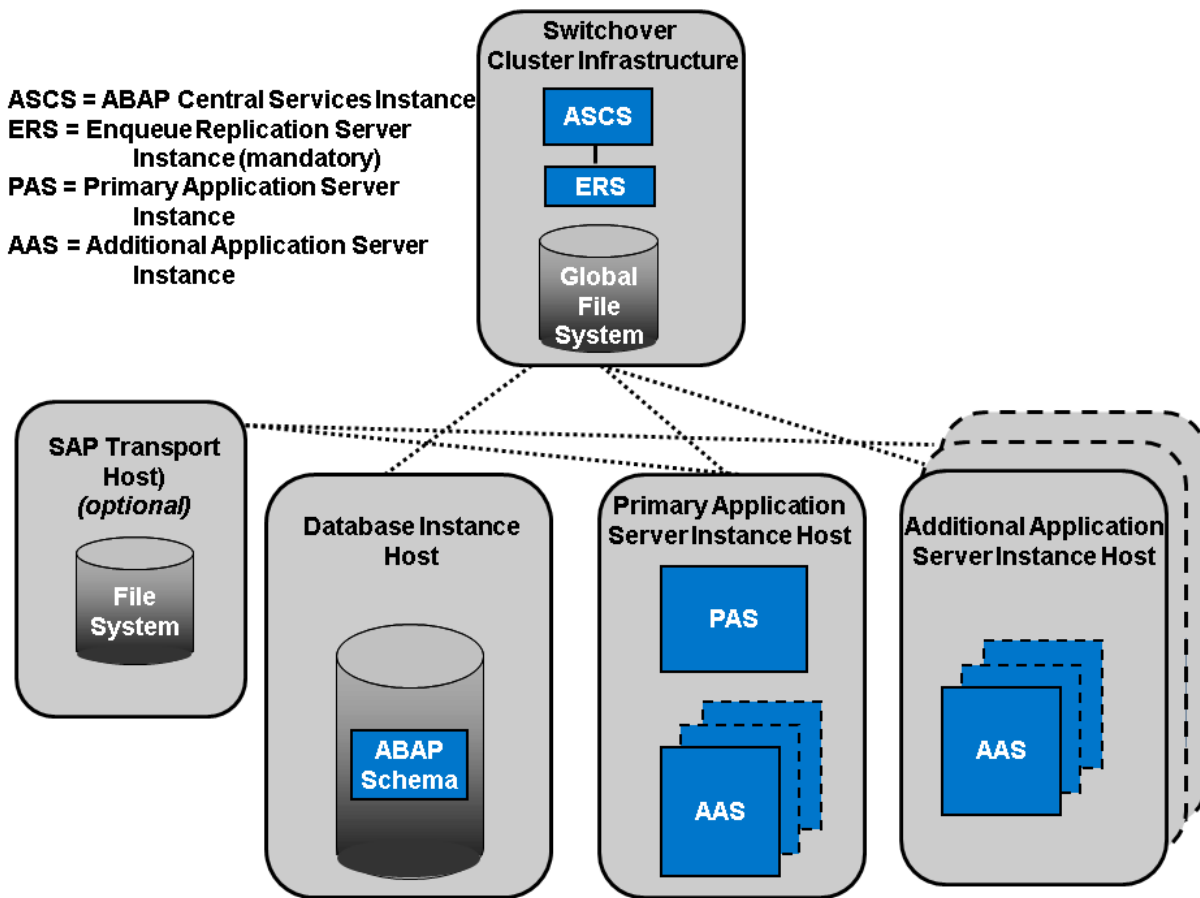


Figure 3: High-Availability System

End of 'High Availability': HA (UNIX)

2.4 Additional Application Server Instance

You can install one or more additional application server instances for an existing SAP system. Additional application server instances are optional and can be installed on separate hosts.

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

i Note

If you want to install additional application server instances running on an operating system other than the primary application server instance, see [Heterogeneous SAP System Installation \[page 177\]](#). For example, you need to do this if your primary application server instance runs on Linux for System z but the additional application server instance is to run on Windows.

Additional Application Server Instance for a Standard System

For example, the following figure shows a standard system with additional application server instances that run:

- 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

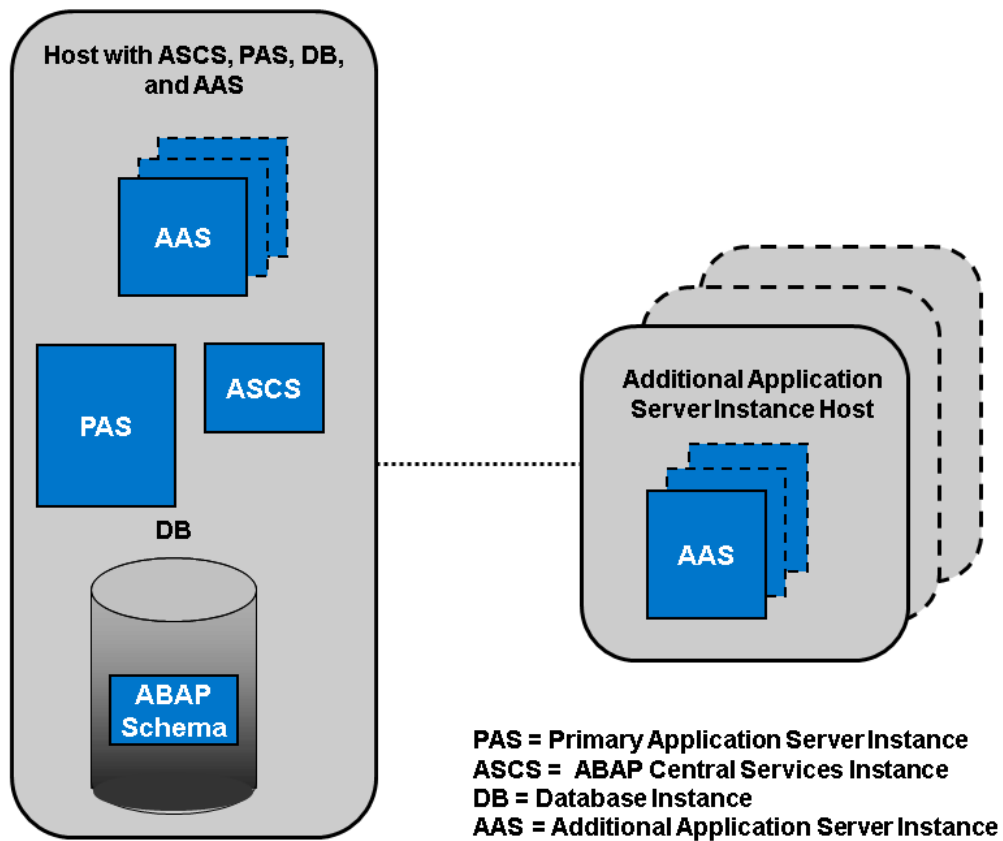


Figure 4: Additional Application Server Instance for a Standard System

For more information, see [Standard System \[page 16\]](#).

Additional Application Server Instance for a Distributed System

The following figure shows a distributed system with additional application server instances that run:

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

We do **not** recommend installing additional application server instances on the SAP global host.

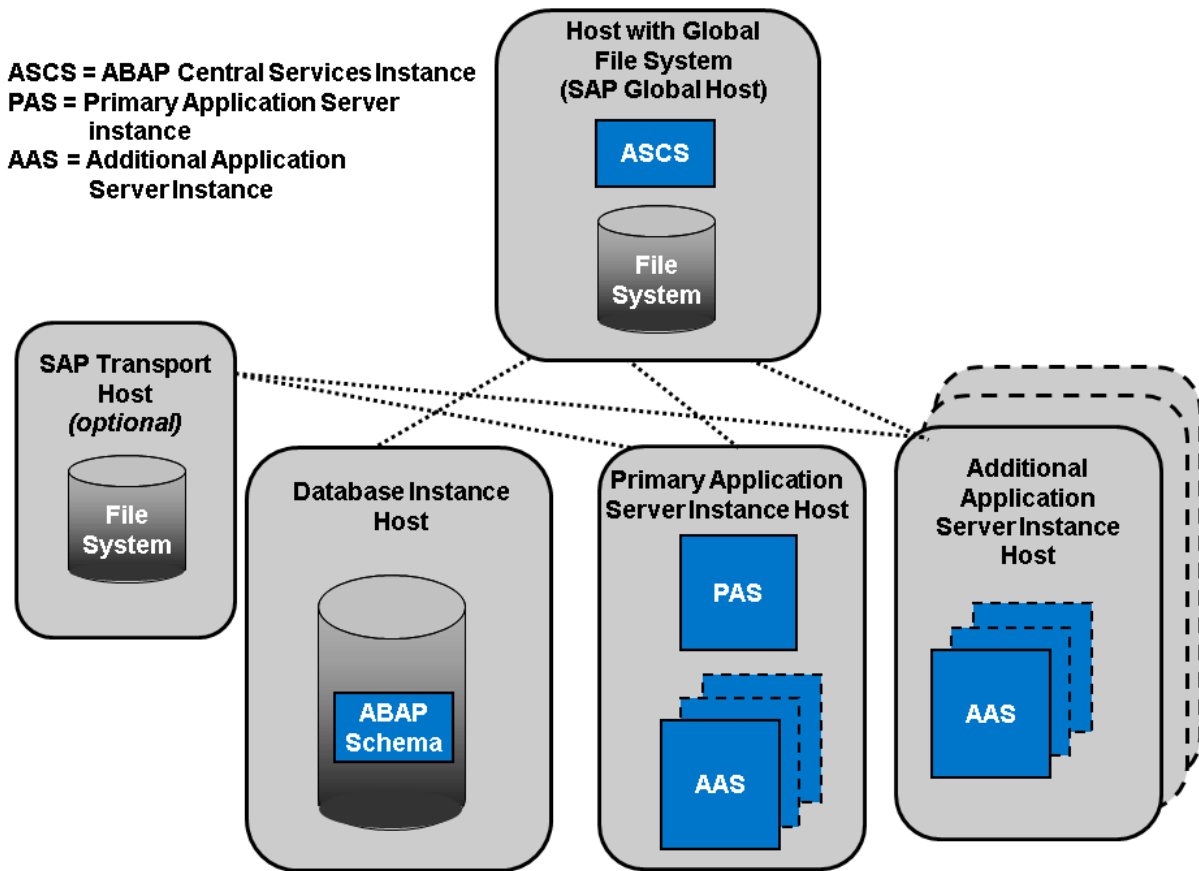


Figure 5: Additional Application Server Instance for a Distributed System

For more information, see [Distributed System \[page 17\]](#).

Only valid for 'High Availability': HA (UNIX)

Additional Application Server Instance for a High-Availability System

The following figure shows a high-availability system with additional application server instances that run:

- On the host of the primary application server instance
- On dedicated hosts

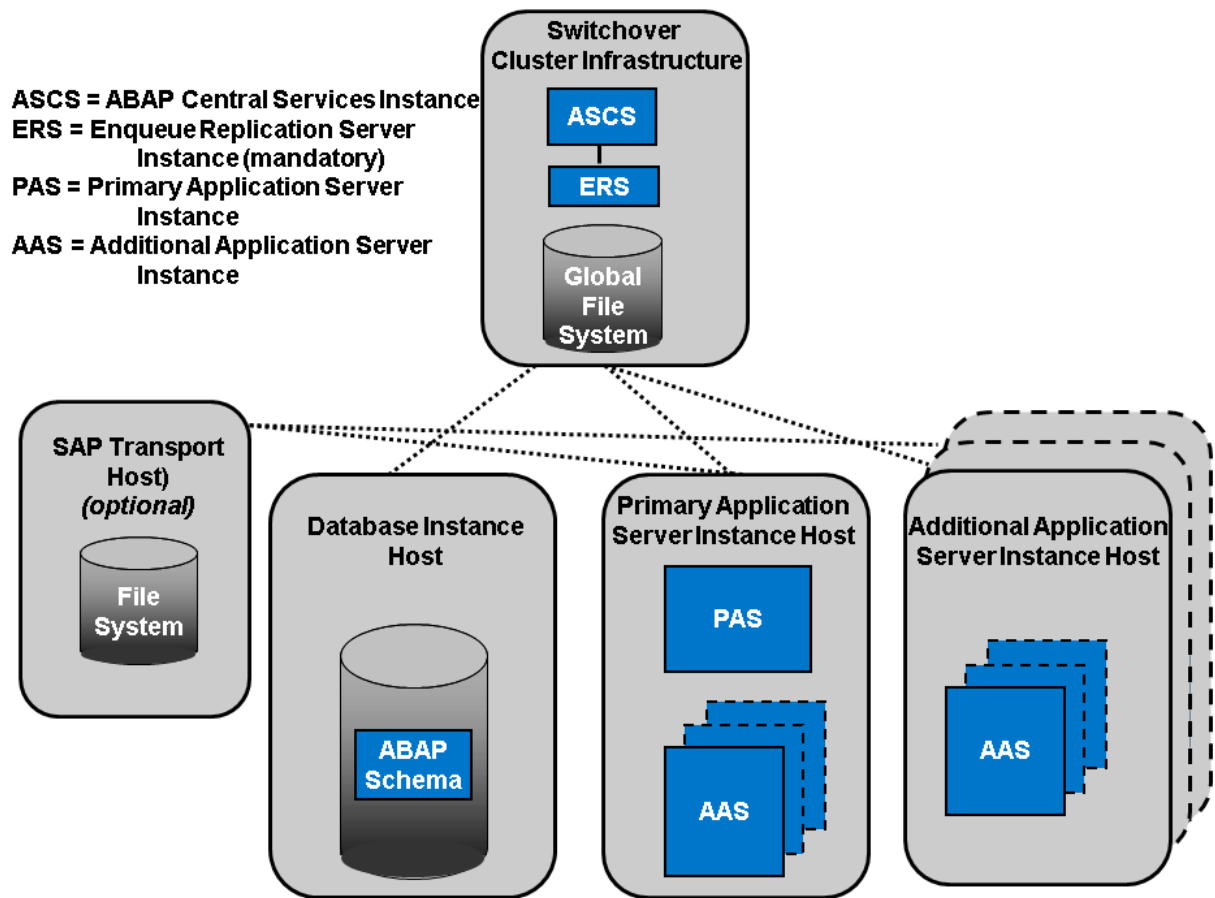


Figure 6: Additional Application Server Instance for a High-Availability System

For more information, see [High-Availability System \[page 18\]](#).

End of 'High Availability': HA (UNIX)

2.5 ABAP Central Services Instance Separate from Existing Primary Application Server Instance of an Upgraded System

The ABAP central services instance (ASCS instance) consists of the essential enqueue and message system services only. With a separate ASCS instance, it is easier for you to later turn your SAP system into a high-availability system.

The benefit of having a separate ASCS instance is mainly in the area of high-availability. This approach concentrates the possible single points of failure of a system into a single instance and, therefore, restricts failure to a single instance.

Every newly installed SAP system based on SAP NetWeaver 7.3 and higher is automatically installed with an ASCS instance, even if you install all SAP system instances on one host (standard system).

However, if you upgraded your SAP system from a release based on a SAP NetWeaver release lower than 7.3, your SAP system might not yet have a separate ASCS instance.

The section [Splitting Off an ABAP Central Services Instance from an Existing Primary Application Server Instance \[page 189\]](#) describes how you can move the message server and the enqueue work process from an existing primary application server instance to a newly installed ABAP central services instance (ASCS instance).

2.6 ASCS Instance with Integrated SAP Web Dispatcher

You can install an SAP Web Dispatcher integrated in the ASCS instance.

If you select this option, an SAP Web Dispatcher is installed running within the ASCS instance. No separate SAP Web Dispatcher instance and no dedicated `<SAPSID>` are created for the SAP Web Dispatcher. We recommend this if you want to use the SAP Web Dispatcher for the system to which the ASCS instance belongs.

Note

We only recommend this option for special scenarios. For more information, see SAP Note [908097](#). For an SAP Web Dispatcher installation, a standalone installation (see below) continues to be the default scenario.

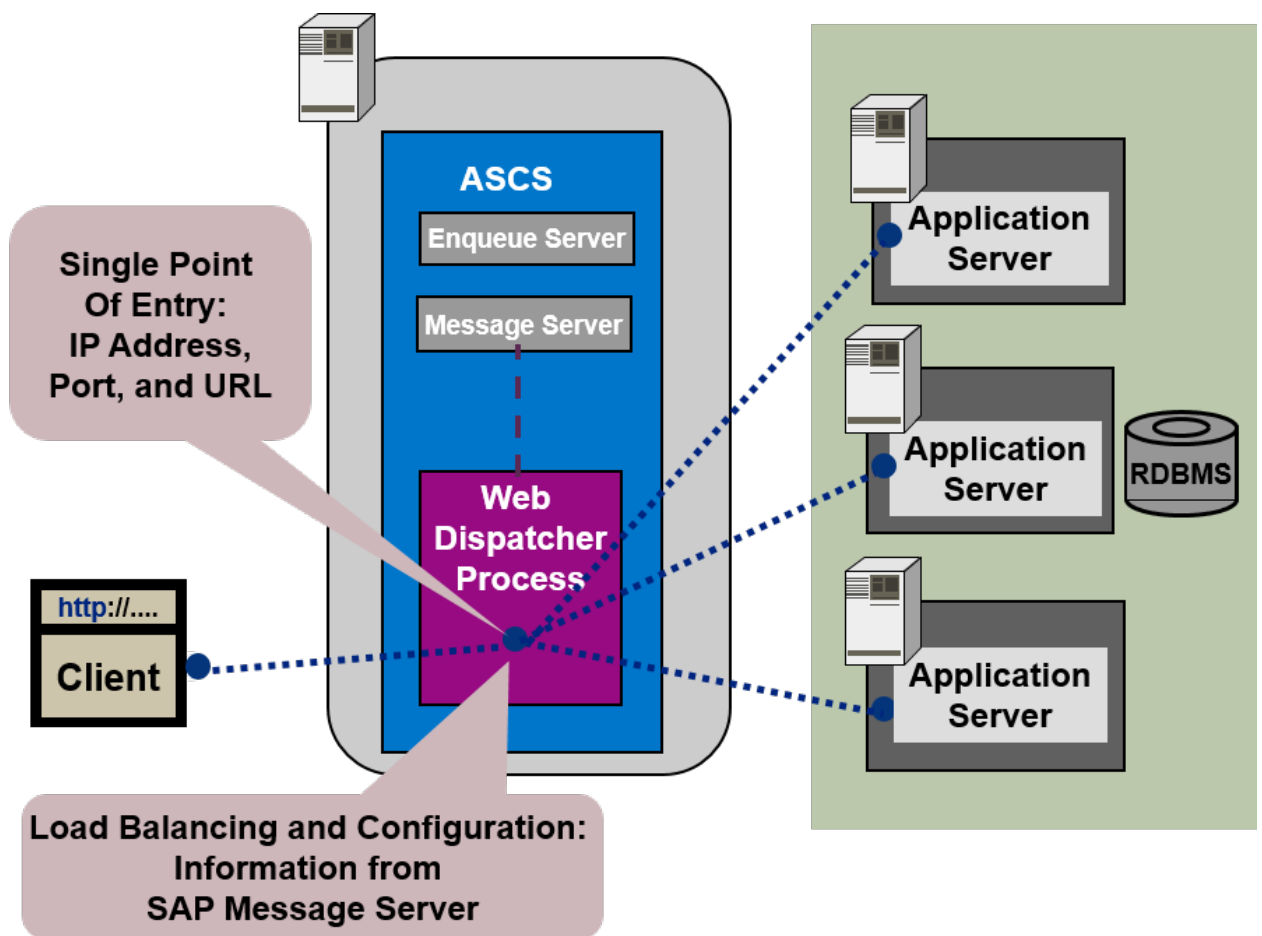


Figure 7: ASCS Instance with Integrated SAP Web Dispatcher

The SAP Web Dispatcher is located between the Web client (browser) and your SAP system that is running the Web application.

It acts as single point of entry for incoming requests (HTTP, HTTPS), defined by the IP address, port, and URL, and forwards them in turn to the application server (AS) of the SAP system.

The SAP Web Dispatcher receives information about the SAP system that it needs for load distribution (load balancing) from the message server and application server via HTTP.

Installation of “Standalone” SAP Web Dispatcher with its own <SAPSID> and Instance

If you want to install an SAP Web Dispatcher for another system - that is not for the system for which you use the ASCS instance and with its own SAP system ID and instance number - you have to install SAP Web Dispatcher separately as described in the documentation *Installation Guide – Installation of SAP Web Dispatcher for SAP Systems Based on SAP NetWeaver 7.1 to 7.5* at <http://help.sap.com/slttoolset> > > > *System Provisioning* > *Installation Option* > *Guide for SAP Web Dispatcher for SAP NetWeaver 7.1 and Higher* >

More Information

For more information about the architecture and the functions of SAP Web Dispatcher, see the Web Dispatcher documentation in the SAP Library at:

Table 5:

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library.</p> <div style="background-color: #fff9c4; padding: 10px;"> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> SAP NetWeaver Process Integration 7.1 http://help.sap.com/nwpi71 SAP NetWeaver Process Integration 7.1 Including Enhancement Package 1 http://help.sap.com/nwpi711 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.3 http://help.sap.com/nw73 SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶</p>

2.7 SAP Host Agent as a Separate Installation

The SAP Host Agent is installed automatically during the installation of new SAP instances with SAP kernel 7.20 or higher (integrated installation). This procedure is only for hosts with no SAP Host Agent running on them.

SAP Host Agent is an agent that can accomplish several life-cycle management tasks, such as operating system monitoring, database monitoring, system instance control and provisioning.

The SAP Host Agent is installed automatically during the installation of new SAP instances with SAP kernel 7.20 or higher (integrated installation).

If you have an SAP system or instance run SAP kernel 7.20 or higher on the host. You do not need to apply the procedure described in the section. This procedure is only for hosts with no SAP Host Agent running on them, due to the following reasons:

- There is no SAP system or instance on the host.
- The SAP system or instance running on the host has a kernel release lower than SAP kernel 7.20 and the host does not yet have an SAP Host Agent.
- You have upgraded your SAP system to a release with a kernel release lower than SAP kernel 7.20 and the host of the upgraded system or instance does not yet have an SAP Host Agent.

The section [Installing the SAP Host Agent Separately \[page 185\]](#) describes how to perform the installation.

3 Planning

3.1 Planning Checklist

This section includes the planning steps that you have to complete for the following installation options.

- Standard, distributed, or high-availability system
- Additional application server instance

Detailed information about the steps is available in the relevant chapter.

Prerequisites

1. You have planned your SAP system landscape according to the Master Guide available at the appropriate download location as described in [Before You Start \[page 9\]](#).
2. You have decided on your installation option (see [Installation Options Covered by this Guide \[page 16\]](#)).

Standard, Distributed, or High-Availability System

i 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. Make yourself familiar with the changed file system structure and profiles for SAP systems based on SAP NetWeaver 7.1 and higher compared to SAP systems based on lower SAP NetWeaver releases. For more information, see [Changed File System Structure and Profiles for SAP Systems Based on SAP NetWeaver 7.1 and Higher \[page 29\]](#).
2. If you want to install an SAP ABAP system along with the required Support Package stack and ABAP Add-Ons in one implementation run, you need to plan the desired installation target using the maintenance planner at <https://apps.support.sap.com/sap/support/mp>.

In the maintenance planner, a stack XML file with the desired Support Package stack and Add-On information is generated, which you then hand over to Software Provisioning Manager (the “installer” for short) by calling it with parameter `SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>`. Included constraints and defaults defined in the stack XML file are then used for the initial installation by Software Provisioning Manager and for the application of Support Package stacks and Add-Ons by the Software Update Manager (SUM).

For more information, see [Installation Using a Stack Configuration File \(Optional\) \[page 30\]](#).

➔ Recommendation

We recommend that you perform the installation using a stack configuration file for all new products such as SAP S/4 HANA on Premise.

3. You [check the hardware and software requirements \[page 32\]](#) on every installation host.
4. You [plan how to set up user and access management \[page 46\]](#).
5. You identify [Basic SAP System Installation Parameters \[page 47\]](#).
6. For the database installation, we recommend that you check the information available in the *SAP on Oracle Knowledge Center* at <http://www.sdn.sap.com/irj/sdn/ora>.
7. For the database installation, you [decide on how to distribute your database components to disk \[page 61\]](#).
8. If your database release is Oracle 12c and you want to install it as a pluggable database in a container database (multitenant database installation), mind the additional steps described in [Oracle Database 12c Multitenant Database Installation \[page 182\]](#).
9. You [decide on the transport host to use \[page 64\]](#).
10. You decide whether you want to [integrate LDAP Directory Services in your SAP system \[page 170\]](#).
11. Only valid for 'High Availability': HA (UNIX)
To install a high-availability system, you read [Planning the Switchover Cluster for High Availability \[page 65\]](#).
End of 'High Availability': HA (UNIX)
12. Optionally, you decide whether you want to [install multiple components in one database \(MCOB\) \[page 175\]](#).
13. Continue with [Preparation \[page 69\]](#).

Additional Application Server Instance

1. You check the [hardware and software requirements \[page 32\]](#) for every installation host on which you want to install one or more additional application server instances.
2. You identify [Basic SAP System Installation Parameters \[page 47\]](#).
3. Continue with [Preparation \[page 69\]](#).

3.2 Changed File System Structure and Profiles for SAP Systems Based on SAP NetWeaver 7.1 and Higher

File system structure

- For SAP system releases based on SAP NetWeaver 7.1 and higher, the directory structure was changed compared to SAP NetWeaver 7.0, in order to support heterogeneous system installations and updates more efficiently.
For more information about how to configure upgraded SAP systems for the new directory structure, see SAP Note [1104735](#).

Caution

The directory structure of systems based on SAP NetWeaver 7.1 or higher is not supported on systems based on SAP NetWeaver 7.0 including Enhancement Packages.

- For a manual switch, see the details about targeted file system structure in this documentation and adjust your file system accordingly to avoid later issues for system transformation such as system copy and system rename.

Profiles

- As of SAP NetWeaver 7.3, the start profile as separate file has been removed. In earlier versions of SAP NetWeaver there was one default profile per SAP system, one start profile per Instance and one Instance profile per instance. Now the start profile contents are merged with the instance profile. With the help of the new instance profile, SAP processes are started and at the same time instance-specific parameters are read. This reduces the total number of profile files to one default profile per SAP System, and one instance profile per instance.

For more information, see the SCN blog *What's new in SAP NetWeaver 7.3 - A Basis perspective* at: <http://scn.sap.com/community/netweaver-administrator/blog/2012/05/22/whats-new-in-sap-netweaver-73--a-basis-perspective>.

Caution

The merged profiles are not supported for SAP NetWeaver 7.0 including Enhancement Packages because this could lead to issues for SAP system copy. If you are not sure which SAP NetWeaver product version you have, see SAP Note [1877731](#) for more information.

- Concatenate instance profile and start profile entries and remove the start profile from the profile directory. For more information, see SAP Note [1898687](#).
- Adjust the `/usr/sap/sapservices` profile file by replacing the start profile with the instance profiles for starting the `sapstartsrv` process, and then restart the SAP start service.
- **Additional application server instances:** Double-check the values with the profile values from the primary application server - for example for parameters `DIR_CT_RUN`, `DIR_EXECUTABLE`, `DIR_SAPJVM` - to avoid startup issues.

3.3 Installation Using a Stack Configuration File

By offering the option to perform an installation using a stack configuration file (also called “up-to-date installation”), SAP has improved the process of provisioning an up-to-date SAP system by creating a unified consumption experience and a direct close collaboration between the involved tools, namely:

- Maintenance Planner, accessible at <https://apps.support.sap.com/sap/support/mp>
- Maintenance Optimizer and LMDB in SAP Solution Manager
- Software Provisioning Manager (the “installer” for short)

- Software Update Manager (“SUM”)

The installer then can take over more default settings that are already predefined in the Maintenance Planner.

➔ Recommendation

To perform the installation using a stack configuration file is above all recommended for new products, such as *SAP S/4HANA, on-premise edition 1511* or *SAP Solution Manager 7.2*.

Restrictions

If you run the installation on an operating system no longer supported for the `SWPM*.SAR` archive, the `RMOSSWPM*.SAR` archive (see [Constraints \[page 8\]](#)) is not downloaded by the Maintenance Planner.

Prerequisites

- To be able to use the Maintenance Planner at <https://apps.support.sap.com/sap/support/mp>, your SAP Solution Manager system must have at least the following release and Support Package (SP) level:
 - Release 7.1 SP06 or higher
 - Release 7.0 SP 23 and you must have the following SAP Notes applied: [1646604](#), [1783371](#), [1743695](#)
- You need to have SAP Note [1940845](#) implemented in your SAP Solution Manager system.
- Check SAP Note [2277574](#) for additional information about involved tools and supported SAP system releases.

Features

You can use a stack configuration file generated by the Maintenance Planner at <https://apps.support.sap.com/sap/support/mp>. The stack configuration can then be consumed by the installer to get better integrated with SUM and to simplify the process of installation for a new system on a target software level. Processing that way eases the task of IT administrators by reducing the efforts in Total Cost of Ownership (TCO). For more information, see the *Best Practice Guide to Planning Landscape Changes* at <http://scn.sap.com/docs/DOC-55363>.

When consuming a stack configuration file, the installer can take over more default settings that are already predefined in the Maintenance Planner and offers more possibilities for automation as compared to when running without it. For more information about the benefits by comparing the existing process with the new improved process, see *Up-To-Date Installation* at <http://scn.sap.com/docs/DOC-56626>.

Integration

For the additional input parameters that you need to specify, see *Additional Parameters When Using a Stack Configuration File (Optional)*. You can find the link to this section in *Related Information* below.

In addition, each section in this guide describing steps that are completely or at least partially automatized when using a stack configuration files is therefore specified with an appropriate notification.

These are the following sections as listed in *Related Information* below.

Related Information

[Additional Parameters When Using a Stack Configuration File \(Optional\) \[page 59\]](#)

[Preparing the Installation Media \[page 88\]](#)

[Running the Installer \[page 110\]](#)

[Configuring the Change and Transport System \[page 146\]](#)

[Applying the Latest Kernel and Support Package Stacks \[page 148\]](#)

[Installing Additional Languages and Performing Language Transport \[page 152\]](#)

3.4 Hardware and Software Requirements

Ensure that your hosts meet the hardware and software requirements for your operating system and the SAP instances. Otherwise you might experience problems when working with the SAP system.

Prerequisites

-  **Caution**

SAP is going to restrict maintenance for operating system versions that have been initially released with SAP kernel 7.2<x> but are no longer supported for SAP kernel 7.40 and higher. The following Software Provisioning Manager operating system versions are affected:

- Only valid for 'Platform': Linux
LINUX ON IA32 32BIT
End of 'Platform': Linux
- Only valid for 'Platform': Linux
LINUX ON IA64 64BIT
End of 'Platform': Linux
- Only valid for 'Platform': Linux
LINUX ON X86_64 64BIT: SLES9, SLES10, SLES11 (<SP2), RHEL4, RHEL5, ORACLE5
End of 'Platform': Linux

- Only valid for 'Platform': HP-UX
HP-UX ON PA-RISC 64BIT
End of 'Platform': HP-UX
- Only valid for 'Platform': HP-UX
IHP-UX ON IA64 64BIT: < 11.31
End of 'Platform': HP-UX
- Only valid for 'Platform': AIX
AIX 64BIT: < 6.0
End of 'Platform': AIX
- Only valid for 'Platform': Oracle Solaris
SOLARIS ON SPARC 64BIT: < 10 aka 5.10
End of 'Platform': Oracle Solaris

With the release of Software Provisioning Manager 1.0 SPS 18, the `SWPM*.SAR` archive will stop working on the above listed outdated operating system versions.

Instead of using the `SWPM*.SAR` archive, you must use the `RMOSSWPM*.SAR` archive for these outdated operating system versions.

Keep in mind that the `RMOSSWPM*.SAR` archive will not receive improvements in the future. SAP maintenance for `RMOSSWPM*.SAR` will be finally stopped by the end of 2017.

SAP recommends upgrading the operating system to a more recent version and using `RMOSSWPM*.SAR` to export from existing SAP systems.

- Make sure that the host name meets the requirements listed in SAP Note [611361](#).
- Contact your OS vendor for the latest OS patches.
- Check your keyboard definitions.
- If you want to install a printer on a host other than the primary application server instance host (for example, on a separate database instance host), check whether the printer can be accessed under UNIX.

Procedure

1. Check the *Product Availability Matrix* at <http://support.sap.com/pam> for supported operating system releases.
2. Check the hardware and software requirements using:
 - The **Prerequisite Checker**:
 - Standalone (optional) before the installation process
For more information, see [Running the Prerequisites Check Standalone \[page 34\]](#).
 - Integrated in the installation tool (mandatory) as part of the installation process
For more information, see [Running the Installer \[page 110\]](#).
 - The hardware and software requirements tables in [Requirements for the SAP System Hosts \[page 35\]](#).
3. If you want to install a **production** system, the values provided by the Prerequisite Checker and the hardware and software requirements checklists are not sufficient. In addition, do the following:
 - You use the `Quick Sizer` tool available at <http://sap.com/sizing>.

- 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

3.4.1 Running the Prerequisites Check in Standalone Mode (Optional)

When you install an SAP system, the installer automatically starts the prerequisites check and checks the hardware and software requirements in the background. As an optional step during planning, you can also run the prerequisites check in standalone mode to check the hardware and software requirements for your operating system and the SAP instances before the actual installation.

Context

➔ Recommendation

We recommend that you use **both** the prerequisites check and the requirements tables for reference.

Procedure

1. Download and unpack the Software Provisioning Manager archive to a local directory as described in [Downloading the Software Provisioning Manager Archive \[page 90\]](#).
2. Make the `SAPPEXE<Version>.SAR` archive available as described in [Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 93\]](#).
3. Start the installer as described in [Running the Installer \[page 110\]](#).
4. On the *Welcome* screen, choose **► <SAP_Product> ► <Database> ► Preparations ► Prerequisites Check ►**.
5. Follow the instructions in the installer dialogs and enter the required parameters.

i Note

For more information about each parameter, position the cursor on the parameter field and choose **F1** in the installer.

After you have finished, the *Parameter Summary* screen appears. This screen summarizes all parameters that you have entered and that you want to have checked. If you want to make a change, select the relevant parameters and choose *Revise*.

6. To start the prerequisites check, choose *Next*.

Results

The *Prerequisite Checker 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.

3.4.2 Requirements for the SAP System Hosts

Every installation host must meet at least the requirements listed in the following tables. Most of the requirements are valid for every installation host whereas some requirements are instance-specific and are marked accordingly.

i Note

The information here and in the following sections is **not** intended to replace the operating system documentation. For more information, see your operating system documentation.

Related Information

[General Installation Information for Your Operating System \[page 35\]](#)

[Hardware Requirements \[page 36\]](#)

[Software Requirements \[page 41\]](#)

[Other Requirements \[page 44\]](#)

3.4.2.1 General Installation Information for Your Operating System

Before checking the hardware and software requirements, we recommend that you make yourself familiar with some general information about installation of SAP systems on your operating system platform.

Table 6: General Installation Information for Your Operating System

Operating System	Information
AIX	Before you start the installation, make sure that you have read SAP Note 1972803 . In addition, we also recommend that you check the information available in the <i>SAP on AIX</i> space on the SAP Community Network at http://scn.sap.com/community/aix .
HP-UX	Before you start the installation, make sure that you have read SAP Note 1075118 . In addition, we also recommend that you check the information available in the <i>SAP on HP-UX Best Practices</i> space on the SAP Community Network at http://scn.sap.com/community/hp-ux .

Operating System	Information
Linux	<p>Before you start the installation, make sure that you have read the SAP Notes for your Linux distribution listed in the central SAP Note 171356.</p> <p>In addition, we also recommend that you check the information available in the <i>SAP on Linux</i> space on the SAP Community Network at http://scn.sap.com/community/linux.</p>
Solaris	<p>Before you start the installation, make sure that you have read SAP Note 1669684.</p> <p>In addition, we also recommend that you check the information available in the <i>SAP on Oracle Solaris</i> space on the SAP Community Network at http://scn.sap.com/community/oracle-solaris.</p>

3.4.2.2 Hardware Requirements

Every installation host must meet at least the hardware requirements listed in the following tables. Most of the requirements are valid for every installation host whereas some requirements are instance-specific and are marked accordingly.

Table 7: Hardware Requirements

Requirement	Values and Activities
Distribution of the Oracle database	<p>We recommend using a redundant storage solution such as RAID5 for data security reasons.</p> <p>To calculate how much storage is required for your Oracle database, see section <i>Database System Configuration</i> in the SAP Library at:</p> <ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 / 7.1 including Enhancement Package 1 and SAP NetWeaver for Banking Services from SAP 5.0 and 6.0: http://help.sap.com/nwmobile71 / http://help.sap.com/nwmobile71 >> <i>Configuration and Deployment Information</i> > <i>Configuration Guide</i> > <i>Configuration of Databases</i> > <i>Database Configuration for Oracle</i> SAP NetWeaver 7.3 / 7.3 including Enhancement Package 1 / 7.4 / 7.5: http://help.sap.com/nw73 / http://help.sap.com/nw731 / http://help.sap.com/nw74 / http://help.sap.com/nw75 >>> <i>Application Help</i> > <i>Function-Oriented View</i> > <i>Database Administration</i> > <i>Database Administration for Oracle</i> > <i>SAP Database Guide: Oracle</i> > <i>Getting Started with Oracle and the SAP System</i>
Hardware requirements	Your hardware must be 64-bit capable.

Requirement	Values and Activities
Processing units	<p>For application server instances and database instances: The number of physical or virtual processing units usable by the operating system image must be equal to or greater than 2.</p> <p>For an ASCS instance running on a separate host: One physical or virtual processing unit usable by the operating system image might be sufficient.</p> <p>Examples of processing units are processor cores or hardware threads (multithreading).</p> <p>In a virtualized environment, ensure that adequate processor resources are available to support the workloads of the running SAP systems.</p>
Optical media drive	ISO 9660 compatible

Requirement	Values and Activities
Hard disk space	<ul style="list-style-type: none"> • General Requirements: <ul style="list-style-type: none"> ◦ 2 GB of temporary disk space for each required physical installation media - or alternatively the downloaded SAP kernel archives - that you have to copy to a local hard disk. For more information, see Preparing the Installation Media [page 88]. ◦ If you prefer downloading the SAP kernel archives instead of using the physical SAP kernel media, you require 2 GB of temporary disk space for the SAP kernel archives that you have to copy to a local hard disk. For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 93]. ◦ 2 GB of temporary disk space for the installation. ◦ 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. • Instance-Specific Requirements: <p>If you install several instances on one host, you have to add up the requirements accordingly.</p> <p>For more information about space requirements for the file systems and directories of the instances, see SAP Directories [page 75] and the appropriate database-specific information listed below.</p> <ul style="list-style-type: none"> ◦ ABAP central services instance (ASCS): <ul style="list-style-type: none"> Minimum 2 GB If you install the ASCS instance with an integrated SAP Web Dispatcher, you require 2 GB of hard disk space in addition. ◦ Enqueue replication server instance for the ASCS (if required): <ul style="list-style-type: none"> Minimum 2 GB If you install the ASCS instance with an integrated SAP Web Dispatcher, you require 2 GB of hard disk space in addition. ◦ Database Instance: <ul style="list-style-type: none"> ◦ SAP ERP: Minimum 75 GB ◦ SAP CRM: Minimum 50 GB ◦ SAP SRM: Minimum 55 GB ◦ SAP SCM: Minimum 50 GB ◦ SAP NetWeaver: Minimum 40 GB <p>For more information about space requirements for the separate file systems and directories, see Oracle Directories [page 80].</p> ◦ Primary application server instance: <ul style="list-style-type: none"> Minimum 2 GB (SAP NetWeaver BW server: Minimum 30 GB) ◦ Additional application server instance: <ul style="list-style-type: none"> Minimum 2 GB (SAP NetWeaver BW server: Minimum 30 GB) ◦ SAP Host Agent: <ul style="list-style-type: none"> Minimum 0.5 GB

Requirement	Values and Activities
RAM	<p>Only valid for 'Platform': AIX</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>Keep in mind that the operating system itself requires about 10% of the available RAM.</p> </div> <p>End of 'Platform': AIX</p> <p>The following lists the RAM requirements for each SAP instance.</p> <p>If you install several instances on one host, you have to add up the requirements accordingly.</p> <ul style="list-style-type: none"> <li>• ABAP Central services instance (ASCS instance) Minimum 1 GB If you install the ASCS instance with an integrated SAP Web Dispatcher, you require 2 GB RAM in addition. <li>• Enqueue replication server instance for the ASCS instance (if required) Minimum 1 GB <li>• Database Instance: Minimum 2 GB <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>The default value used by the installer is 50 percent of the entire RAM.</p> </div> <ul style="list-style-type: none"> <li>• Primary application server instance: Minimum 3 GB (BW server: Minimum 2 GB) <li>• Additional application server instance: Minimum 3 GB <li>• SAP Host Agent: Minimum 1 GB <p>Only valid for 'Platform': HP-UX</p> <p>Refer to SAP Note 1112627 for the commands to display the RAM size on HP-UX.</p> <p>End of 'Platform': HP-UX</p> <p>Only valid for 'Platform': Linux</p> <p>Refer to SAP Note 1382721 for the commands to display the RAM size on Linux.</p> <p>End of 'Platform': Linux</p>

Requirement	Values and Activities
AIX: Paging space	<p>You need hard disk drives with sufficient paging space. You can calculate the required paging space as follows:</p> <ul style="list-style-type: none"> • Optimistic strategy: You need at least 20 GB for the primary application server instance and at least another 10 GB for every additional application server instance. • Defensive strategy: 3 * RAM, at least 20 GB <p>In addition, for the database instance you need:</p> <ul style="list-style-type: none"> • 0.75 * RAM, if RAM is greater than 8 GB • 1 * RAM, if RAM is less than 8 GB <p>For the latest information about recommended paging space, see SAP Note 1121904.</p>
HP-UX: Swap space	<p>You need hard disk drives with sufficient space for swap. You can calculate the required swap space as follows:</p> <p>2 * RAM, at least 20 GB</p> <p>SAP NetWeaver Process Integration 7.5 or higher: 2 * RAM or 80 GB, whichever is higher</p> <p>For more information about HP-UX swap space recommendations and about how to set up swap space, see SAP Note 1112627.</p>
Linux: Swap space	<p>You need hard disk drives with sufficient space for swap. We recommend that you use the amount of swap space as described in SAP Note 1597355. You might decide to use more or less swap space based on your individual system configuration and your own experience during daily usage of the SAP system.</p>
Solaris: Swap space	<p>You need hard disk drives with sufficient space for swap. You can calculate the required swap space as follows:</p> <p>At least 20 GB are required. For more information, see SAP Note 570375.</p>
Verifying paging space size and kernel settings using <code>memlimits</code>	<p>To verify paging space size and kernel settings, you can execute <code>memlimits</code> as follows:</p> <ol style="list-style-type: none"> 1. Make sure that the <code>SAPCAR</code> program is available on the installation host. If <code>SAPCAR</code> is not available, you can download it from https://support.sap.com/swdc. 2. Make the <code>SAPEXE.SAR</code> archive available on the installation host. This archive is contained in the folder <code>K_<Kernel_Version>_<U/N>_<OS>/DBINDEP</code> of the installation media. 3. To unpack the file <code>memlimits</code>, enter the following command: <code>SAPCAR -xvfg SAPEXE.SAR memlimits</code> 4. Start <code>memlimits</code> using the following command: <code>./memlimits -l 20000</code> <p>In case of error messages, increase the paging space and rerun <code>memlimits</code> until there are no more errors.</p>

3.4.2.3 Software Requirements

Every installation host must meet at least the software requirements listed in the following tables. Most of the requirements are valid for every installation host whereas some requirements are instance-specific and are marked accordingly.

Table 8: Software Requirements

Requirement	Values and Activities
Database software	Check the Product Availability Matrix (PAM) at http://support.sap.com/pam for supported database platforms.
AIX: Operating system version	<p>Your operating system platform must be 64-bit.</p> <p>Check the Product Availability Matrix (PAM) at http://support.sap.com/pam for supported operating system versions.</p> <p>Contact your OS vendor for the latest OS patches.</p> <p>Minimal OS requirements for the specific SAP Kernel releases are listed in SAP Note 1780629.</p>
HP-UX: Operating system version	<p>Your operating system platform must be 64-bit.</p> <p>Check the Product Availability Matrix (PAM) at http://support.sap.com/pam for supported operating system versions.</p> <p>To check the operating system version on your installation hosts, use the following command:</p> <pre>uname -r</pre> <p>See SAP Note 939891 for information about support time frames of HP-UX.</p>
Linux: Operating system version	<p>Your operating system platform must be 64-bit.</p> <p>Check the Product Availability Matrix (PAM) at http://support.sap.com/pam for supported operating system versions.</p> <p>Contact your OS vendor for the latest OS patches.</p> <p>To check the operating system version on your installation hosts, use the following command:</p> <pre>cat /etc/*-release</pre>
Solaris: Operating system version	<p>Your operating system platform must be 64-bit.</p> <p>Check the Product Availability Matrix (PAM) at http://support.sap.com/pam for supported operating system versions.</p> <p>To check the operating system version on your installation hosts, use the following command:</p> <pre>/bin/uname -r</pre>

Requirement	Values and Activities
SAP Kernel Releases and Versions	<p>For more information about release and roadmap information for the kernel versions and how this relates to SAP NetWeaver support packages, including important notes on downward compatibility and release dates, see the document <i>Understanding Kernel Releases for the SAP NetWeaver AS ABAP</i> at http://scn.sap.com/docs/DOC-54170.</p>
AIX: Kernel parameters	<p>To adjust AIX Virtual Memory Management settings, see SAP Note 973227.</p>
HP-UX: Kernel parameters	<p>To run an SAP system, make sure that you check and, if necessary, modify the HP-UX kernel.</p> <div style="background-color: #fff9c4; padding: 10px;"> <p>⚠ Caution</p> <p>We recommend that a UNIX system administrator performs all kernel modifications.</p> </div> <p>Proceed as follows:</p> <ol style="list-style-type: none"> 1. Check SAP Note 172747 for recommendations on current HP-UX kernel parameters. <div style="background-color: #fff9c4; padding: 10px;"> <p>⚠ Caution</p> <p>If a kernel value is already larger than the one suggested in the SAP Note, do not automatically reduce it to match the SAP requirement.</p> <p>You have to analyze the exact meaning of such a parameter and, if required, to reduce the parameter value. In some cases this might improve the performance of your SAP applications.</p> </div> <ol style="list-style-type: none"> 2. If necessary, modify the kernel parameters in one of the following ways: <ul style="list-style-type: none"> ○ Manually, as described in SAP Note 172747. ○ Interactively, using the HP-UX System Administrator Manager (SAM) or System Management Homepage (SMH).

Requirement	Values and Activities
Linux: Kernel parameters	<p>Check SAP Note 171356 for Linux kernel versions certified by SAP.</p> <p>To check the Linux kernel parameters for your Linux distribution, see one of the following SAP Notes:</p> <ul style="list-style-type: none"> • Oracle Linux: SAP Note 1565179 • RHEL4: SAP Note 722273 • RHEL5: SAP Note 1048303 • RHEL6: SAP Note 1496410 • RHEL7: SAP Note 2002167 • SLES9: SAP Note 797084 • SLES10: SAP Note 958253 • SLES 11: SAP Note 1310037 • SLES 12: SAP Note 1984787
Solaris: Kernel parameters	<p>To run an SAP system, you must check and, if necessary, modify the Solaris kernel parameters or resource controls.</p> <ul style="list-style-type: none"> • Solaris 9: SAP Note 395438 • Solaris 10: SAP Note 724713 • Solaris 11: SAP Note 1797712
HP-UX: OS patches	<p>To check the minimum required OS patches, see SAP Note 837670.</p>
Solaris: OS patches	<p>Check the relevant SAP Note for required Solaris patches:</p> <ul style="list-style-type: none"> • Sun Solaris 9 on SPARC: SAP Note 550585 • Sun Solaris 10 on SPARC: SAP Note 832871 • Solaris 10 on x64: SAP Note 908334 • Solaris 11: SAP Note 1797712
AIX: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding <code>locales</code> are installed.</p>
HP-UX: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding <code>locales</code> are installed.</p> <p>You can check this as follows:</p> <ul style="list-style-type: none"> • Enter the following commands to check whether National Language Support (NLS) is installed: <code>swlist -v grep -i nls</code> The output should contain the string <code>NLS-AUX . . .</code> • Enter the following commands to check which locales are available: <code>locale -a</code> The following files must be available: <code>de_DE.iso88591</code>, <code>en_US.iso88591</code>.

Requirement	Values and Activities
Linux: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding <code>locales</code> are installed.</p> <p>You can check this as follows:</p> <ul style="list-style-type: none"> • Ensure that the required <code>locales</code> such as the following are available: <code>de_DE</code>, <code>en_US</code> • Check SAP Note 187864 for information about corrected operating system <code>locales</code> and SAP <code>blended Code Pages</code>.
Solaris: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding <code>locales</code> are installed.</p> <p>Enter the following command to check which <code>locales</code> are available:</p> <pre>locale -a</pre> <p>The following locale must be available: <code>en_US.ISO8859-1</code></p>
System language	For the installation, you must choose English as the operating system language on all hosts that run SAP software.
HP-UX: Language libraries	<p>To make sure that the file set <code>LANG-MIN</code> is installed, enter the following command:</p> <pre>swlist -v grep -i lang-min</pre> <p>If nothing is displayed, the file set is not available, and needs to be installed.</p>
SAP Kernel 7.40 and Higher: IP Multicast Configuration	Make sure that you have applied the operating system patches required for IP Multicast Configuration. For more information, see SAP Note 1931675 .

3.4.2.4 Other Requirements

Every installation host must meet at least the requirements listed in the following tables. Most of the requirements are valid for every installation host whereas some requirements are instance-specific and are marked accordingly.

Table 9: Other Requirements

Requirement	Values and Activities
Minimum Web Browser	<p>Make sure that you have at least one of the following web browsers installed on the host where you run the installer GUI:</p> <ul style="list-style-type: none"> • Internet Explorer 9.0 or higher • Mozilla Firefox • Google Chrome <p>You need this to be able to display the Evaluation Form and send it to SAP.</p>

Requirement	Values and Activities
AIX: Additional software	<p>Make sure that the following additional file sets are installed:</p> <ul style="list-style-type: none"> • <code>bos.adt</code> – Base Application Development • <code>bos.perf</code> – performance and diagnostics tools • <code>perfagent.tools</code> – performance monitoring tools • <code>bos.perf.libperfstat</code> – Performance Statistics Library
Host name	<p>To find out physical host names, open a command prompt and enter <code>hostname</code>.</p> <p>For more information about the allowed host name length and characters allowed for SAP system instance hosts, see SAP Note 611361.</p> <p>Only valid for 'Platform': HP-UX</p> <p>For HP-UX, see SAP Note 1503149 in addition.</p> <p>End of 'Platform': HP-UX</p> <p>If you want to use virtual host names, see SAP Note 962955.</p>
Login shell	<p>The installer only prompts you for this parameter if you use a login shell other than the recommended C shell (csh).</p> <p>For more information, see SAP Note 202227.</p> <p>Only valid for 'Platform': HP-UX</p> <p>For HP-UX, see SAP Note 1038842 in addition.</p> <p>End of 'Platform': HP-UX</p> <p>SAP Host Agent installation:</p> <ul style="list-style-type: none"> • Make sure that <code>/bin/false</code> can be used as a login shell. • Only valid for 'Platform': AIX AIX only: Add <code>/bin/false</code> to the list of valid login shells (attribute <code>shells</code>) in <code>/etc/security/login.cfg</code>. <p>End of 'Platform': AIX</p>
HP-UX: Mount and file system configuration	<p>For recommendations about block size and mount option configuration, see SAP Note 1077887.</p>
Shared file systems for decentralized systems	<p>If application servers are installed decentralized, a "shared" file system must be installed, for example Network File System (NFS).</p>
AIX: C++ Runtime environment	<p>Minimal C++ runtime requirements for the specific SAP Kernel releases are listed in SAP Note 1780629.</p>
Linux: C compiler	<p>Make sure that the C compiler <code>gcc</code> is installed.</p>

3.5 Planning User and Access Management

You have to plan how to configure user and access management for the SAP system to be installed.

Before you add a newly installed SAP system to your system landscape, you must decide which kind of user management you want to use:

- Central User Administration (CUA)
- An LDAP directory as the data source for user data

For more information about configuring the user management of your SAP system to be installed, see the SAP Library at:

Table 10:

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none"> • SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 • SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>Identity Management of the Application Server ABAP</i> ▶</p>
<ul style="list-style-type: none"> • SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 • SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library.</p> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p>
<ul style="list-style-type: none"> • SAP NetWeaver Process Integration 7.1 http://help.sap.com/nwpi71 • SAP NetWeaver Process Integration 7.1 Including Enhancement Package 1 http://help.sap.com/nwpi711 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>Identity Management of the Application Server ABAP</i> ▶</p>
<ul style="list-style-type: none"> • SAP NetWeaver 7.3 http://help.sap.com/nw73 • SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 • SAP NetWeaver 7.4 http://help.sap.com/nw74 • SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>User and Role Administration of Application Server ABAP</i> ▶ <i>Configuration of User and Role Administration</i> ▶ <i>Directory Services</i> ▶ <i>LDAP Connector</i> ▶</p>

Procedure

To specify the initial data source of the User Management Engine (UME), proceed as described in [Specifying the Initial Data Source of the User Management Engine \[page 108\]](#).

3.6 Basic Installation Parameters

The installer prompts for input parameters during the *Define Parameters* phase of the installation.

You can install your SAP system either in *Typical* or *Custom* mode:

- *Typical*

If you choose *Typical*, the installation is performed with default settings. This means that the installer prompts you only for a small selection of installation parameters. These parameters include at least the following:

- SAP system ID and database connectivity parameters
- Master password
- SAP system profile directory – only for systems with instances on separate hosts
- **SAP systems based on SAP NetWeaver 7.40 and higher:** Individual encryption key for the secure storage

For more information about the installation parameters, see the corresponding tables below in this document. If you want to change any of the default settings, you can do so on the *Parameter Summary* screen.

- *Custom*

If you choose *Custom*, you are prompted for all parameters. At the end, you can still change any of these parameters on the *Parameter Summary* screen.

i Note

You cannot change from *Custom* to *Typical* mode or from *Typical* to *Custom* mode on the *Parameter Summary* screen.

i Note

If you want to [install an ASCS instance with an integrated SAP Web Dispatcher instance \[page 24\]](#), you must choose *Custom*. Otherwise, you are not prompted for the [SAP Web Dispatcher installation parameters \[page 61\]](#) during the *Define Parameters* phase.

The tables in the sections below list the basic SAP system installation parameters that you need to specify before installing your SAP system. For all other installation parameters, use the **F1** help on the installer screens.

Related Information



[SAP System Parameters \[page 48\]](#)

[SAP System Database Parameters \[page 57\]](#)

[Additional Parameters When Using a Stack Configuration File \(Optional\) \[page 59\]](#)

3.6.1 SAP System Parameters

Table 11: General Parameters

Parameter	Description
Unicode System	<p>Every new installation of an SAP system is Unicode.</p> <p>SAP systems based on SAP NetWeaver 7.1 to 7.4:</p> <p>You can only deselect this option if you perform the target system installation in the context of a system copy for a non-Unicode SAP system that has been upgraded to the current release.</p> <p>SAP NetWeaver 7.5 is Unicode only.</p> <p>If you install an additional application server instance in an existing non-Unicode system (that has been upgraded to the current release), the additional application server instance is installed automatically as a non-Unicode instance. The installer checks whether a non-Unicode system exists and chooses the right executables for the system type.</p>
SAP System ID <SAPSID>	<p>The SAP system ID <SAPSID> identifies the entire SAP system.</p> <p>The installer prompts you for the <SAPSID> when you execute the first installation option to install a new SAP system.</p> <p>If there are further installation options to be executed, the installer prompts you for the <code>profile</code> directory. For more information, see the description of the parameter <i>SAP System Profile Directory</i>.</p> <div style="background-color: #fff9c4; padding: 10px; margin: 10px 0;"> <p> Example</p> <p>This prompt appears when you install the primary application server instance, which is the first instance to be installed in a distributed system.</p> </div> <div style="background-color: #fff9c4; padding: 10px; margin: 10px 0;"> <p> Caution</p> <p>Choose your SAP system ID carefully since renaming requires considerable effort.</p> </div> <p>Make sure that your SAP system ID:</p> <ul style="list-style-type: none"> • Is unique throughout your organization. Do not use an existing <SAPSID> when installing a new SAP system. • Consists of exactly three alphanumeric characters • Contains only uppercase letters • Has a letter for the first character • Does not include any of the reserved IDs listed in SAP Note 1979280. • If you want to install an additional application server instance, make sure that no Gateway instance with the same SAP System ID (SAPSID) exists in your SAP system landscape.

Parameter	Description
Instance Number of the SAP System	<p>Technical identifier for internal processes. It consists of a two-digit number from 00 to 97.</p> <p>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.</p> <p>If you do not enter a specific value, the instance number is set automatically to the next free and valid instance number that has not yet been assigned to the SAP system to be installed or to SAP systems that already exist on the installation host.</p> <p>To find out the instance numbers of SAP systems that already exist on the installation host, look for subdirectories ending with <code><Instance_Number></code> of local (not mounted) <code>/usr/sap/<SAPSID></code> directories.</p> <p>For more information about the naming of SAP system instances, see SAP Directories [page 75].</p> <p>Only valid for 'Platform': AIX</p> <div style="background-color: #fff9c4; border: 1px solid #ccc; padding: 10px;"> <p>⚠ Caution</p> <p>If you are using NIM Service Handler (NIMSH), do not use 01 or 02 for the instance number. The installer uses the instance number for the internal message server port <code>39<Instance_Number></code> (see row "Message Server Port" in this table below). The NIM client daemon uses reserved ports 3901 and 3902.</p> </div> <p>End of 'Platform': AIX</p> <p>Only valid for 'Platform': HP-UX</p> <div style="background-color: #fff9c4; border: 1px solid #ccc; padding: 10px;"> <p>⚠ Caution</p> <p>Do not use:</p> <ul style="list-style-type: none"> <li>• 75 for the instance number because this number is already used by the operating system. For more information, see SAP Note 29972. <li>• 02 as the instance number because this number is used to determine the port number for report RSLGCOLL, which is <code>14<Instance_Number></code> by default. However, port 1402 is already used by the OS process <code>rstlisten</code>. If you still decide to use 02 as the instance number, the instance fails to start during the installation process. You then have to manually change the port number for report RSLGCOLL to continue with the installation. For more information, see Running the Installer [page 110]. </div> <p>End of 'Platform': HP-UX</p>

Parameter	Description
Virtual Host Name	<p>Virtual host name (network name) of the <code>SAP<SAPSID></code> cluster group</p> <p>You can assign a virtual host name to an SAP instance in one of the following ways:</p> <ul style="list-style-type: none"> You can provide a virtual host name in the <code><Instance_Name> Virtual Host</code> field on the installer screen of the relevant instance. Then this instance is installed with the given virtual host name. Alternatively you can assign virtual host names also by starting the installer with the <code>SAPINST_USE_HOSTNAME</code> property. For more information, see Running the Installer [page 110]. <p>After the installation has completed, all application servers can use this virtual host name to connect to the instance. The virtual host name is also a global host name. If you do not provide the virtual host name, the instance is installed automatically using its physical host name.</p> <p>You must have already reserved the virtual host name (network name) and its IP address on a DNS server before you run the installer. For more information, see Using Virtual Host Names [page 87].</p> <div style="background-color: #fff9c4; padding: 10px;"> <p>i Note</p> <p>Fully qualified host names, <code>IPv4</code>, <code>IPv6</code> are not accepted as virtual host names.</p> </div>
SAP Process Integration (PI) 7.5 and Higher: Application Server Gateway Communication Setup	<p>When installing the primary application server for the SAP Process Integration ABAP system, you have to define the host for the primary application server of the SAP Process Integration Java system. You can specify a host different from the host of the SAP Process Integration ABAP system.</p> <p>The connection between the SAP Process Integration ABAP and SAP Process Integration Java system is set up</p>
<code>/<sapmnt>/<SAPSID>/profile</code> or <code>/usr/sap/<SAPSID>/SYS/profile</code>	<p>The installer retrieves parameters from the SAP system profile directory of an existing SAP system.</p> <p>SAP profiles are operating system files that contain instance configuration information.</p> <p>The installer prompts you to enter the location of the <code>profile</code> directory when the installation option that you execute is not the first one belonging to your SAP system installation, for example if you are installing a distributed system or an additional application server instance to an existing SAP system. See also the description of the parameters <i>SAP System ID</i> and <i>Database ID</i>.</p> <p><code>/usr/sap/<SAPSID>/SYS/profile</code> is the soft link referring to <code>/<sapmnt>/<SAPSID>/profile</code>.</p>

Parameter	Description
Master Password	<p>Common password for all users that are created during the installation:</p> <ul style="list-style-type: none"> Operating system users (for example <code><sapsid>adm</code>) <div style="background-color: #fff9c4; padding: 10px; margin: 10px 0;"> <p>i Note</p> <p>The Master Password is not used as password for the Database Users such as Database Administrator User or DB Connect User.</p> </div> <div style="background-color: #fff9c4; padding: 10px; margin: 10px 0;"> <p>⚠ Caution</p> <p>If you did not create the operating system users manually before the installation, the installer creates them with the common master password (see <i>Operating System Users</i>). In this case, make sure that the master password meets the requirements of your operating system.</p> </div> <ul style="list-style-type: none"> ABAP users: <code>SAP*</code>, <code>DDIC</code>, and <code>EARLYWATCH</code>. Secure Store key phrase SAP systems based on SAP NetWeaver 7.40 and Higher: For more information, see line <i>Key Phrase for Secure Store Settings</i> and line <i>Individual Encryption Key for the Secure Storage</i> in this table. <p>Password policy</p> <p>The master password must meet the following requirements:</p> <ul style="list-style-type: none"> It must be 8 to 14 characters long It must contain at least one digit (0-9) It must not contain \ (backslash) and " (double quote) It must contain at least one letter (a-z, A-Z) It must not begin with a digit nor an underscore It can contain the following characters: <code>_</code>, <code>#</code>, <code>\$</code>, <code>a-z</code>, <code>A-Z</code>, <code>0-9</code> Depending on the installation option, additional restrictions may apply.
Message Server Access Control List	<p>You can specify if you want to have a message server Access Control List (ACL) created.</p> <p>The ACL is created as a file in the <code>/<sapmnt>/<SAPSID>/global</code> directory. If it exists, it defines the hosts from which the message server accepts requests.</p> <div style="background-color: #fff9c4; padding: 10px; margin: 10px 0;"> <p>⚠ Caution</p> <p>Only trigger the creation of this file if you do not plan to install any additional instances for this system. With the creation of this ACL, you overwrite existing settings and prevent instances from being installed on additional hosts. If you decide to install an additional instance later, you need to remove this file manually before the installation and create it again after the installation of the additional instance.</p> </div> <p>For more information, see the information about <code>ms/acl_info</code> in SAP Notes 1495075 and 826779.</p>


Parameter	Description
<p>SAP systems based on SAP NetWeaver 7.40 and Higher only:</p> <p>Individual Encryption Key for the Secure Storage</p>	<p>You can set a randomly generated individual encryption key for the secure storage in the file system and the secure storage in the database. If you skip this step, the system is installed with a default key which provides obfuscation only, but it can be changed later.</p> <ul style="list-style-type: none"> For more information on the secure storage in the file system, see the SAP Library at: http://help.sap.com ► Technology Platform ► SAP NetWeaver ► SAP NetWeaver <Release> ► Application Help ► Function-Oriented View: English ► Security ► System Security ► System Security for SAP NetWeaver AS ABAP Only ► Secure Storage in the File System (AS ABAP) ► For more information on the secure storage in the database, see the SAP Library at: http://help.sap.com ► Technology Platform ► SAP NetWeaver ► SAP NetWeaver <Release> ► Application Help ► Function-Oriented View: English ► Security ► System Security ► System Security for SAP NetWeaver AS ABAP Only ► Secure Storage (ABAP) ► Key Management ► Using Individual Encryption Keys ► Generating Encryption Keys ►
<p>DNS Domain Name for SAP System</p>	<p>If you want to use HTTP-based URL frameworks such as Web Dynpro applications, you have to specify the DNS domain name for the SAP system.</p> <p>The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter <code>SAPLOCALHOSTFULL</code>. FQDN is the fully qualified domain name for an IP address. It consists of the host name and the domain name:</p> <p><code><Host_Name>.<Domain_Name></code></p> <p>The DNS Domain Name is needed to define the URLs for the ABAP and Java application servers. It is appended to the server name to calculate the FQDN.</p> <div style="background-color: #fff9c4; padding: 10px; margin-top: 10px;"> <p> Example</p> <p>If your application server host is called <code>kirk.wdf.sap.com</code>, the DNS Domain Name is <code>wdf.sap.com</code>.</p> </div>

Table 12: Ports



Parameter	Description
<p>ABAP Message Server Port</p>	<div style="background-color: #fff9c4; padding: 5px;"> <p> Caution</p> <p>The message server port number must be unique on the host where the message server for the SAP system is running. If there are several message servers running on one host, the message server ports must all be unique.</p> </div> <p>If you do not specify a value, the default port number is used.</p> <p>ABAP Message Server Port</p> <p>There is an external message server port and an internal message server port.</p> <p>The ABAP message server uses both the internal and the external message server ports. The default profile contains the configuration for both message server ports.</p> <p>The external message server port uses the parameter <code>rdisp/msserv</code> with default value <code>36<ABAP_Message_Server_Instance_Number></code>.</p> <p>The internal message server port uses the parameter <code>rdisp/msserv_internal</code> with default value <code>39<ABAP_Message_Server_Instance_Number></code>.</p>
<p>SAP NetWeaver 7.5 and Higher only:</p> <p>Communication Port for ABAP</p>	<p>For a secure communication of connected SAP systems to the ABAP stack you have to define the HTTPS port that is to be configured in the application server instance profile. Further post-installation steps are required to fully enable HTTPS communication. For more information about HTTPS enablement, see SAP Note 1527879.</p> <p>In addition you can configure an HTTP port. However, this is not recommended for productive SAP systems due to security reasons.</p> <div style="background-color: #fff9c4; padding: 5px;"> <p> Recommendation</p> <p>If you are about to install an SAP NetWeaver 7.5 Process Integration system and you intend to run automated configuration using the Central Technical Configuration (CTC) Wizard after the installation, it is strongly recommended that you configure the ABAP communication port for ABAP already during the installation process, because you can only run the CTC Wizard if the ABAP port is either completely configured for HTTPS or optionally for HTTP (see also PI: Configuring the Process Integration System After the Install [page 154]).</p> </div>

Table 13: Operating System Users


Parameter	Definition
Operating System Users and Groups	<p>The installer processes the operating system users as follows:</p> <ul style="list-style-type: none"> • If the operating system users do not exist, the installer creates the following users: <ul style="list-style-type: none"> ◦ The SAP system administrator user <sapsid>adm ◦ Database administrator users <p>The installer sets the master password for these users by default. You can overwrite and change the passwords either by using the parameter mode Custom or by changing them on the parameter summary screen.</p> • If the operating system users already exist, the installer prompts you for the existing password, except if the password of these users is the same as the master password. • Make sure that the user ID and group ID of these operating system users are unique and the same on each relevant application server instance host. <p>For more information, see Creating Operating System Users and Groups [page 70].</p>

Table 14: User Management Engine Parameters

Parameter	Definition
Java Administrator User	<p>The installer creates this user in the ABAP system.</p> <p>After the installation, this user is available both in the ABAP and in the Java system.</p> <p>The installer sets the user name J2EE_ADMIN and the master password by default.</p> <p>If required, you can choose another user name and password according to your requirements.</p> <div style="background-color: #fff9c4; padding: 10px; margin-top: 10px;"> <p>i Note</p> <p>This user is only created during the installation the application server ABAP for an SAP NetWeaver 7.5 Process Integration (PI) system or for an SAP Solution Manager 7.2 system.</p> </div>

Parameter	Definition
Java Guest User	<p>This user is for employees who do not belong to a company or who have registered as company users and who are waiting for approval. Guest users belong to the default group <code>Authenticated Users</code>.</p> <p>The installer creates this user in the ABAP system.</p> <p>After the installation, it is available both in the ABAP and in the Java system.</p> <p>The installer sets the user name <code>J2EE_GUEST</code> and the master password by default.</p> <p>If required, you can choose another user name and password according to your requirements.</p> <p>For more information about supported UME data sources and change options, see SAP Note 718383.</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>This user is only created during the installation the application server ABAP for an SAP NetWeaver 7.5 Process Integration (PI) system or for an SAP Solution Manager 7.2 system.</p> </div>
Communication User	<p>The installer creates this user in the ABAP system.</p> <p>After the installation, it is available both in the ABAP and in the Java system</p> <p>This user is used for the communication between the ABAP system and the Java system.</p> <p>The installer sets the user name <code>SAPJSF</code> and the master password by default.</p> <p>If required, you can choose another user name and password according to your requirements.</p> <p>For more information about supported UME data sources and change options, see SAP Note 718383.</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>This user is only created during the installation the application server ABAP for an SAP NetWeaver 7.5 Process Integration (PI) system or for an SAP Solution Manager 7.2 system.</p> </div>

Table 15: System Landscape Directory

Parameter	Definition
SLD Destination for the System	<p>The System Landscape Directory (SLD) registers the systems and the installed software of your entire system landscape.</p> <p>You can choose between the following options:</p> <ul style="list-style-type: none"> • <i>Register in existing SLD</i> Choose this option to register the SAP system you are installing in an existing SAP System Landscape Directory (SLD) by specifying the SLD connection parameters listed below in this table. • <i>No SLD destination</i> Choose this option if you do not want to register the SAP system you are installing in an existing SAP System Landscape Directory (SLD). You then have to configure the SLD destination manually after the installation has finished.
SLD Host	The host name of the existing SLD.
SLD HTTP(S) Port	<p>The HTTP or HTTPS port of the existing SLD. The following naming convention applies: 5<Instance_Number>00.</p> <div style="background-color: #fff9c4; padding: 10px; border: 1px solid #ccc;"> <p> Example</p> <p>If the instance number of your Java system is 01, the SLD HTTPS Port is 50100.</p> </div>
SLD Data Supplier User and password	The existing SLD Data Supplier user and password of the existing SLD

3.6.2 SAP System Database Parameters

Table 16:

Parameters	Description
Database ID <DBSID>	<p>The <DBSID> identifies the database instance. The installer prompts you for the <DBSID> when you are installing the database instance.</p> <p>The <DBSID> can be the same as the <SAPSID>.</p> <div style="background-color: #fff9c4; padding: 10px; border: 1px solid #ccc;"> <p>⚠ Caution</p> <p>Choose your database ID carefully. Renaming is difficult and requires you to reinstall the SAP system.</p> </div> <ul style="list-style-type: none"> • If you want to install a new database: Make sure that your database ID: <ul style="list-style-type: none"> ○ Is unique throughout your organization ○ Consists of exactly three alphanumeric characters ○ Contains only uppercase letters ○ Has a letter for the first character ○ Does not include any of the reserved IDs listed in SAP Note 1979280. • MCOD only: 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. For more information, see Installation of Multiple Components in One Database [page 175]. • If you want to perform a Multitenant Database installation, you have to specify one database system ID (<DBSID>) for the container database (CDB) and one <PDBSID> for each pluggable database (PDB). SAP A <PDBSID> cannot be equal to the assigned <DBSID>. The <DBSID> must be different from the <SAPSID>, because the default and recommended value for the <PDBSID> is the <SAPSID> of the SAP system running with the PDB. For more information, see Oracle Database 12c Multitenant Database Installation [page 182].
Database schema, Password	<p>The ABAP database schema is named SAP<SCHEMA_ID>.</p> <p>Default name is SAPSR3.</p> <div style="background-color: #fff9c4; padding: 10px; border: 1px solid #ccc;"> <p>➔ Recommendation</p> <p>Choose a <SCHEMA_ID> that is different from your <SAPSID>.</p> <p>It might cause problems when you copy a system where <SCHEMA_ID> is the same as <SAPSID>, and the database-specific method used for the copy does not allow you to rename the database schemas. In certain situations, you might create a system copy with a new <SAPSID>, but where the database schema has the old <SAPSID>. This is not a technical problem but it might confuse the system administrator.</p> </div>

Parameters	Description
Oracle Listener Name, Oracle Listener Port, Oracle Listener Domain	<ul style="list-style-type: none"> • If you install the database instance on a host where no other Oracle database is installed, you normally do not have to change the default values for Listener Name and Listener Port. • If there is already an Oracle database installed on your installation host, you can either use one listener for both databases or you have to specify an unused Listener Name and an unused Listener Port for the new listener. For more information if you use one listener for both databases, see SAP Note 98252. • All additional application server instances of an SAP system must use the same Listener Port than the database instance. • The default domain in the network configuration files is <code>WORLD</code>.
Tablespaces, Datafiles	<p>An Oracle database consists of one or more logical storage units called <code>tablespaces</code>, which collectively store all of the database's data.</p> <p>Each <code>tablespace</code> in an Oracle database consists of one or more files called <code>datafiles</code>, which are physical structures that conform to the operating system in which Oracle is running.</p> <p><code>MaxDatafileSize</code> is the initial size of the <code>tablespace</code> datafile and its mapping to the new <code>tablespace</code> layout while importing the external file <code>DBSIZE.XML</code>.</p> <p>The installer prompts you to enter <code>MaxDatafileSize</code> in MB:</p> <ul style="list-style-type: none"> • 0: Datafile size defined in <code>DBSIZE.XML</code> is not changed. • 2000: Default datafile size. • 10000: Maximum datafile size. <p>For more information about space requirements of the SAP datafiles (<code>sapdata 1 - 4</code>), see Hardware and Software Requirements Tables [page 35].</p>

3.6.3 Additional Parameters When Using a Stack Configuration File (Optional)

The parameters in this section are only required if you use a stack configuration file generated from the Maintenance Planner.

Table 17:

Parameter	Description
Transport Domain	<p>The ABAP Transport Management System (TMS) must be configured before ABAP correction packages can be applied. You can also run the configuration or even reconfigure the TMS after the installation has finished.</p> <p>To be able to transport changes between the SAP systems in your system landscape, you need to configure the Transport Management System (TMS) for all SAP systems in your system landscape and configure one transport domain controller. To start the TMS in your ABAP system for later reconfiguration, call transaction STMS. At least one transport landscape with this system as transport domain controller is required before you can apply corrections, support packages, or upgrades to the SAP system.</p> <p>The name of the Transport Domain must not contain blank characters. You cannot change the name afterwards without reconfiguring the transport domain controller and thereby the entire Transport Domain.</p> <p>By default use <code>DOMAIN_<SAPSID></code> for the Transport Domain of a single transport landscape with this system as transport domain controller.</p>
Directory with Transport Files	<p>Location of the ABAP transport files that are to be included after the ABAP load during the installation. All transport files in this directory are imported with the transport control program (<code>tp</code>).</p>
Location of SPAM/SAINT Update Archive	<p>A SPAM/SAINT update contains updates and improvements to the Support Package Manager (SPAM) and the Add-On Installation Tool (SAINT). Provide the full path to the SPAM/SAINT update archive.</p> <p>SPAM/SAINT is delivered with the ABAP load. SAP recommends that you always use the latest version of SPAM/SAINT before applying Support Packages.</p>

Parameter	Description
Decide whether you want to prepare for the Software Update Manager run at the end of the installation	<p>With the Software Update Manager 1.0 (SUM), you can apply support packages stacks at the end of the installation.</p> <ul style="list-style-type: none"> Do not start SUM automatically Start SUM automatically at the end of the installation <p>Choose to start SUM automatically, if you want to have the SUM STARTUP script called in the default <code><Update Directory>/SUM/</code> directory at the end of the installation.</p> <p>To successfully start SUM with a version higher than SUM 1.0 SP11, the SAP Host Agent patch level must be at least 189. Revise the SA-PHOSTAGENT.SAR archive location on screen Unpack Archives if you have downloaded the required version from https://support.sap.com/swdc.</p>
Extract the SUM* .SAR Archive	<p>If you choose to extract the SUM* .SAR archive, the provided archive is extracted to the default update directory:</p> <p>UNIX and IBM i: <code>/usr/sap/<SAPSID>/</code></p>
SUM HTTP port	<p>If you are running several SAP system updates on the same host, you have to use different port numbers for each update. You can adjust the default SUM HTTP port by entering the required port number in the SUM HTTP Port field. When doing so you set the SUM GUI Port number to <code>(=<HTTP port number+2>)</code>. Dependencies See also the Software Update Manager documentation at: http://help.sap.com/sltoolset</p> <p>► <i>Software Logistics Toolset 1.0</i> ► <i>Documentation</i> ► <i>System Maintenance</i> ►</p>
SUM Batch Input File	<p>You can specify a batch file with some default values for the update. SUM then starts with parameter <code>batchfile=<XML file with input parameters></code>.</p> <p>Enter the full path to the existing batch file.</p> <p>Placeholders like <code>@PARAMETER_VALUE@</code> inside the file are replaced by values known from the installation.</p>
Install Additional Languages	<p>A set of default languages is delivered with the ABAP load. From the language media delivered with your product version, you can select additional languages that you want to have installed during SAP system installation.</p> <p>If you want to install additional languages you must provide the directory with the additional language packages for the ABAP installation load, for example with subdirectories like <code>DATA_UNITS/ES</code>.</p>

For more information, see [Installation Using a Stack Configuration File \(Optional\) \[page 30\]](#).

Related Information

[Installation Using a Stack Configuration File \[page 30\]](#)

3.6.4 Additional Parameters for an SAP Web Dispatcher Installation Integrated in the ASCS Instance (Optional)

You only need to specify the following parameters during the ASCS instance installation if you perform an integrated installation of a SAP Web Dispatcher instance.

i Note

You must choose *Custom* parameter mode. Otherwise you are not prompted for the SAP Web Dispatcher installation parameters during the *Define Parameters* phase.

Table 18:

Parameters	Description
Message Server Host	The name of the host on which the message server is located (profile parameter <code>rdisp/mshost</code>)
Message Server HTTP Port	HTTP port of the message server (profile parameter <code>ms/server_port_<xx></code>)
Password for the Internet Communication Management (ICM) user	In order to use the web administration interface for the Internet Communication Manager (ICM) and SAP Web Dispatcher, an administration user <code>webadm</code> is created by the installer. You have to assign a password for this user.

Related Information

[ASCS Instance with Integrated SAP Web Dispatcher \[page 24\]](#)

3.7 Distribution of SAP System Components to Disks

When you install the SAP system, the main directories required for the system are automatically created. However, during the installation procedure, the installer prompts you to enter drive letters for the main components of the system. This gives you the opportunity to distribute components to disks in the system as you wish. How you do this significantly affects system throughput and data security, and must therefore be carefully planned. The best distribution depends on your specific environment and must take into consideration factors such as the size of the components involved, security requirements, and the expected workload.

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

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

Minimal Configuration

The following figure illustrates an example for a disk configuration for a small test or demo system. Since security and performance play a less crucial role in this type of system, many different configurations are feasible.

⚠ Caution

Use the illustrated configuration exclusively for test or demo systems. It is unsuitable for production systems because it only minimally satisfies security and performance requirements.

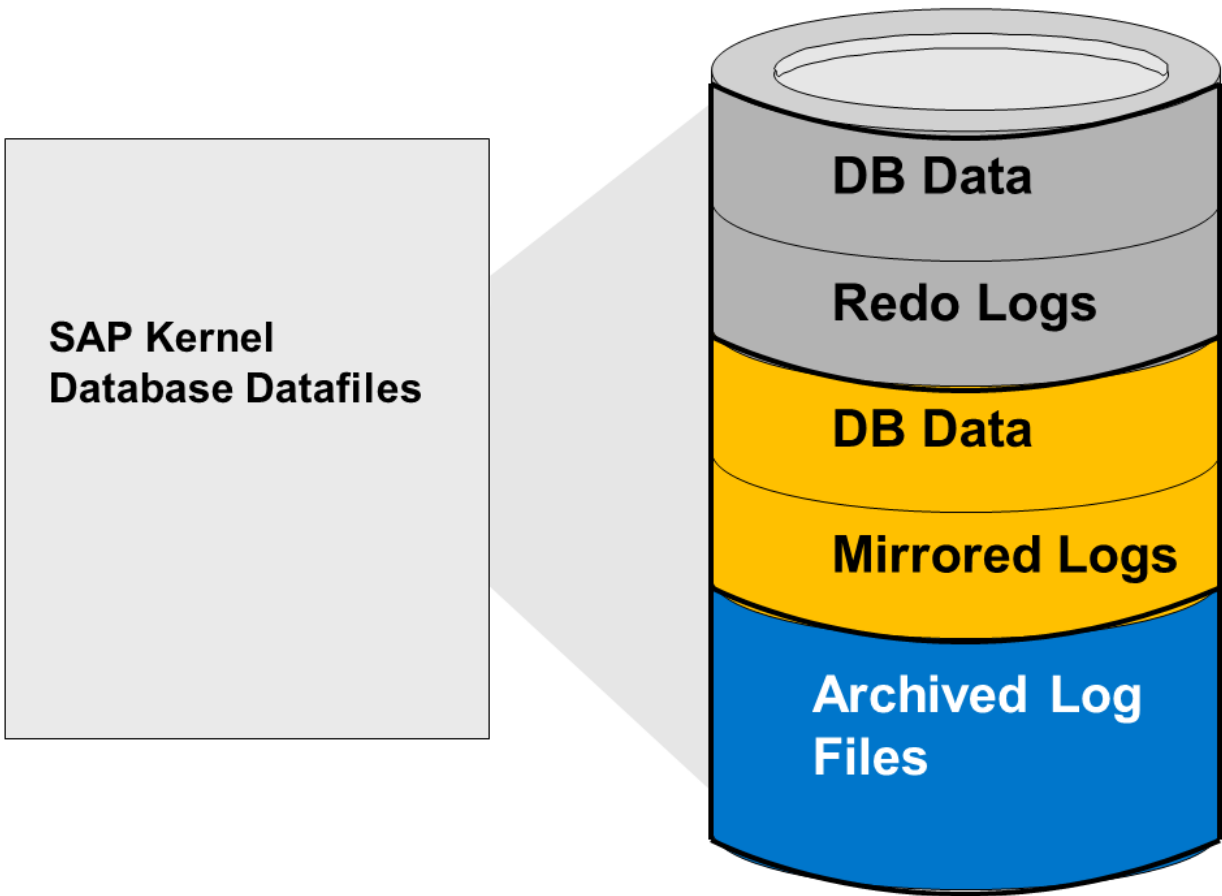


Figure 8: Configuration for Test or Demo System

Distribution of Database Directories to Disks

Table 19:

Disk	Directories
Disk 1	/oracle/<DBSID>/1120<x> (Oracle 11g) /<Oracle 12g path> (Oracle 12g, user-defined directory) /oracle/<DBSID>/origlogA /oracle/<DBSID>/origlogB /oracle/<DBSID>/sapdata1 /oracle/<DBSID>/sapdata2
Disk 2	/oracle/<DBSID>/mirrlogA /oracle/<DBSID>/mirrlogB /oracle/<DBSID>/sapreorg /oracle/<DBSID>/saptrace /oracle/<DBSID>/saparch /oracle/<DBSID>/sapbackup /oracle/<DBSID>/sapcheck /oracle/<DBSID>/sapdata3 /oracle/<DBSID>/sapdata4 /oracle/<DBSID>/sapprof
Disk 3	/oracle/<DBSID>/oraarch

i Note

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

3.8 SAP System Transport Host

Use

The transport host contains the transport directory used by the SAP transport system to store transport data and change SAP system information, such as software programs, write dictionary data, or Customizing data. If you have several SAP systems it depends on your security requirements whether you want them to share a transport directory or whether you use separate directories.

When you install an SAP system, you have to decide which transport host and directory you want to use for your SAP system:

- Use the transport directory that the installer creates during the installation of the SAP system by default on the global host.
The installer by default creates the transport directory on the global host in `/usr/sap/trans`.
- Use a transport directory located on a host other than the default host:
 - You can use an **existing** transport directory and host in your SAP system landscape.
 - You can set up a **new** transport directory on a different host.

In either case, you must prepare this host for use by the new SAP system. For more information, see [Exporting and Mounting the Global Transport Directory \[page 105\]](#).

More Information

- [Required File Systems and Directories \[page 74\]](#)
- See the SAP Library:

Table 20:

Release	SAP Library Path
<ul style="list-style-type: none">◦ SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71◦ SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 (use the SAP Library for SAP NetWeaver Mobile 7.1)◦ SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711◦ SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 (use the SAP Library for SAP NetWeaver Mobile 7.1 including Enhancement Package 1)	<p>▶ Application Help ▶ Function-Oriented View ▶ ABAP Technology / Application Server ABAP ▶ Administration Tools for AS ABAP ▶ Change and Transport System ▶ Change and Transport System – Overview ▶ Basics of the Change and Transport System ▶ Transport Management System – Concept ▶</p>

Release	SAP Library Path
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.3 http://help.sap.com/nw73 ○ SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Solution Life Cycle Management</i> ▶ <i>Software Logistics</i> ▶ <i>Change and Transport System</i> ▶ <i>Change and Transport System – Overview</i> ▶ <i>Basics of the Change and Transport System</i> ▶ <i>Transport Management System – Concept</i> ▶</p>

3.9 Planning the Switchover Cluster for High Availability

This topic is only valid for 'High Availability': HA (UNIX)

Use

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 trying to access the failed software unit might experience a short delay but can then resume processing as normal.

Switchover clusters also have the advantage that you can deliberately initiate switchover to release 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 high availability (HA) into your SAP system.

➔ Recommendation

We recommend 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:

- Check the information and the installation guides that are available at <http://scn.sap.com/docs/DOC-7848> .
- The enqueue replication server (ERS) is essential for a high-availability system. You need one ERS for the ASCS installed in your system.

Features

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

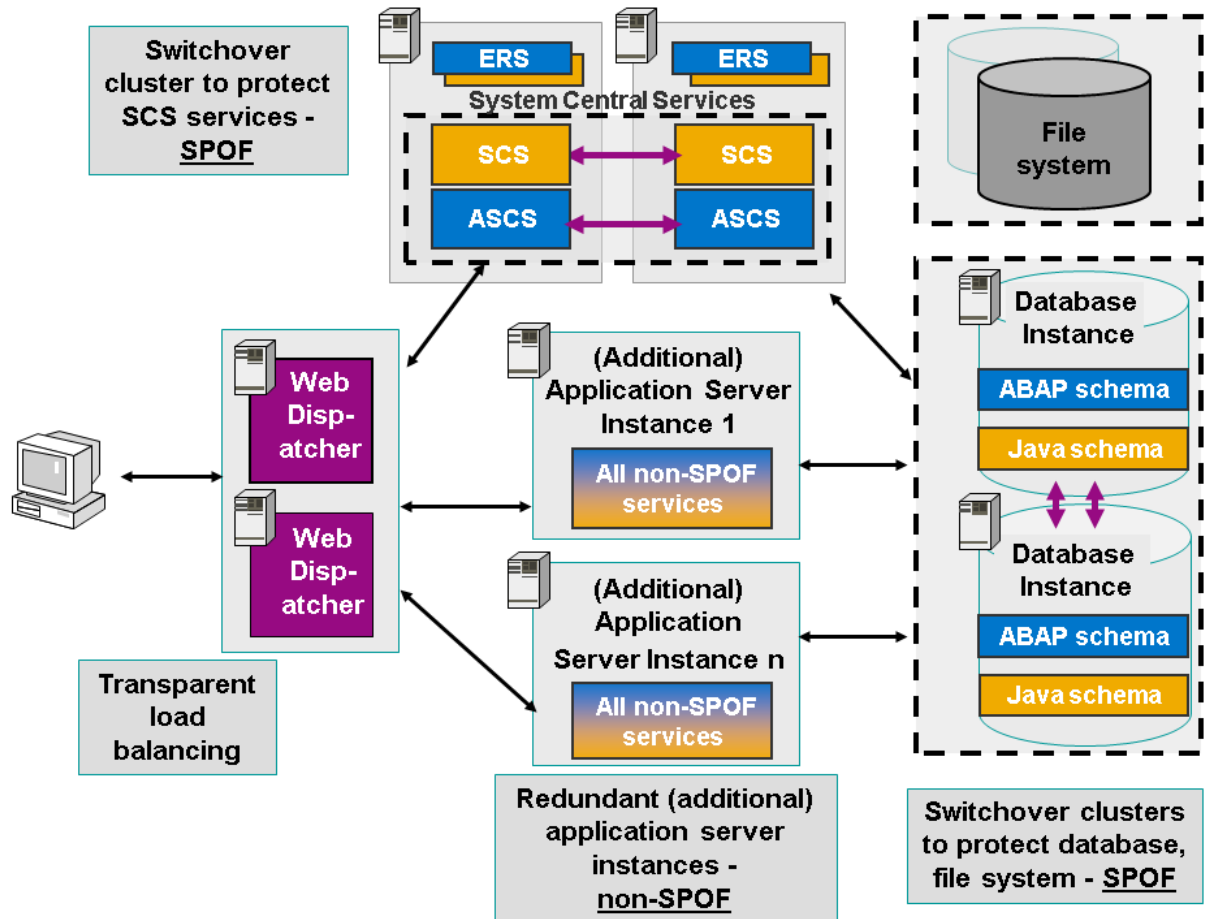


Figure 9: Switchover Setup

i Note

This figure and the figures in this section are only **examples**. Only the instances relevant to the switchover are shown – for example, the primary application server instance is not shown.

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).

You need to discuss your individual HA setup with your HA partner.

The following graphic shows an example of a switchover cluster in more detail:

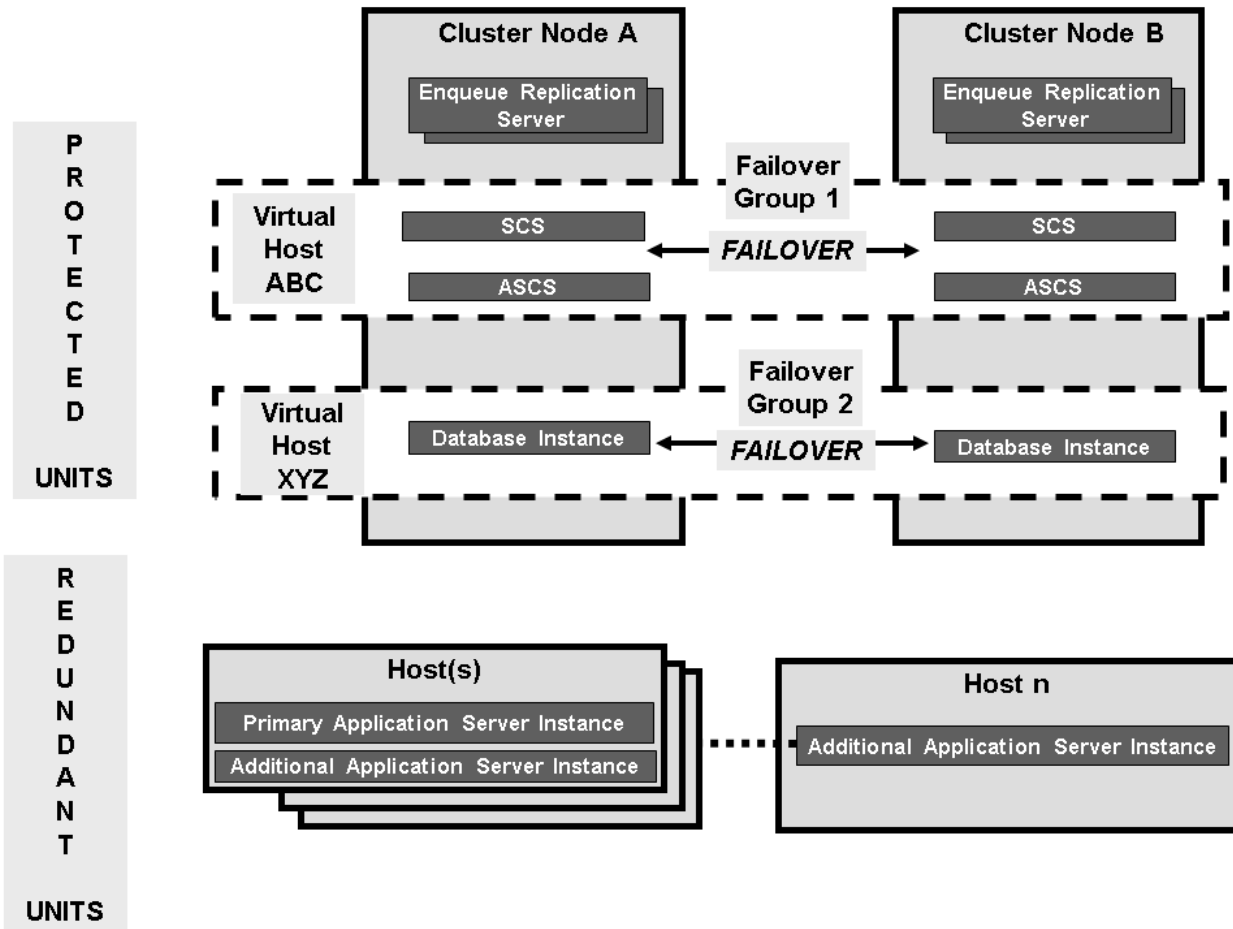


Figure 10: Switchover Cluster

Constraints

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

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

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.

End of 'High Availability': HA (UNIX)

4 Preparation

4.1 Preparation Checklist

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

- Standard, distributed, or high-availability system
- Additional application server instance

Detailed information about the steps is available in the relevant section.

Standard, Distributed, or High-Availability System

i 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 check that the required [operating system users and groups \[page 70\]](#) are created.
2. You [set up file systems \[page 74\]](#) and make sure that the required disk space is available for the directories to be created during the installation.
3. If you want to use virtual host names, you have to [set the environment variable SAPINST_USE_HOSTNAME \[page 87\]](#).
Alternatively you can specify a virtual host name either in the command to start the installer or - after the installer has started in the relevant field on the respective instance screen (see [Running the Installer \[page 110\]](#)).
4. If you want to install a high-availability system, you [perform switchover preparations \[page 87\]](#).
5. If you want to share the transport directory `trans` from another system, [export \[page 105\]](#) this directory to your installation hosts.
6. You [install the SAP front-end software \[page 88\]](#) on the desktop of the user.
7. You check that the required [installation media \[page 88\]](#) are available on each host.
8. If you decided to use a generic LDAP directory, you have to [create a user for LDAP directory access \[page 176\]](#).
9. You continue with [Installation \[page 98\]](#).

Additional Application Server Instance

You have to perform the following preparations on the host where you install the additional application server instances:

1. You check that the required [operating system users and groups \[page 70\]](#) are created.
2. You [set up file systems \[page 74\]](#) and make sure that the required disk space is available for the directories to be created during the installation.
3. If you want to use virtual host names, you have to [set the environment variable SAPINST_USE_HOSTNAME \[page 87\]](#).
Alternatively you can specify a virtual host name either in the command to start the installer or - after the installer has started in the relevant field on the respective instance screen (see [Running the Installer \[page 110\]](#)).
4. If you want to share the transport directory `trans` from another system, [export \[page 105\]](#) this directory to your installation hosts.
5. You [install the SAP front-end software \[page 88\]](#) on the desktop of the user.
6. You check that the required [installation media \[page 88\]](#) are available.
7. You continue with [Installation \[page 98\]](#).

4.2 Creating Operating System Users and Groups

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

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

The installer 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.

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

Only valid for 'High Availability': HA (UNIX)

➔ 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).

End of 'High Availability': HA (UNIX)

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 the installer and choose **► Generic Installation Options ► <Database> ► Preparation ► Operating System Users and Groups ►**.

For more information, see [Running the Installer \[page 110\]](#).

- You create operating system users and groups manually. Check the settings for these operating system users.

Constraints

- You have to set the limits for operating system users as follows:

Table 21:

Operating System	Action
AIX	Proceed as described in SAP Note 323816 .
HP-UX	Check the output of command <code>limit</code> (if you use <code>csh</code> shell) or <code>ulimit -a</code> (if you use <code>sh</code> or <code>ksh</code> shell) according to section OS Dependencies All Operating Systems of SAP Note 1704753 .
Linux	Check the output of command <code>limit</code> (if you use <code>csh</code> shell) or <code>ulimit -a</code> (if you use <code>sh</code> or <code>ksh</code> shell) according to section OS Dependencies All Operating Systems of SAP Note 1704753 .
Solaris	Check the output of command <code>limit</code> (if you use <code>csh</code> shell) or <code>ulimit -a</code> (if you use <code>sh</code> or <code>ksh</code> shell) according to section OS Dependencies All Operating Systems of SAP Note 1704753 .

- All users **must** have identical environment settings. Any change to the environment – such as variables, or paths – is at your own responsibility.
- If you have multiple operating system users with user ID (UID) 0, you must assign the `sapinst` group to all of them.
- Do **not** delete any shell initialization scripts in the home directory of the operating system users. This applies even if you do not intend to use the shells that these scripts are for.
- If you use NFS-V4 file system, you have to create the `ora<dbSID>` user and - if your database release is Oracle 12 - the `oracle` user on the NFS server. You can do this either manually or by running [Operating System Users and Groups](#). This user must have the same user ID as the `ora<dbSID>` user and - if your database release is Oracle 12 - the `oracle` user on the database server. Otherwise, you see the error message `FSL-02098 Could not change owner of ...` during the installation of the database instance.
- If you install an SAP system with instances distributed over several hosts, make sure that the following requirements are met:
 - The user ID (UID) and group ID (GID) of each operating system user must be unique and the same on each instance host that belongs to the same SAP system.
 - Make sure that the group ID of group `sapinst` is always different from the group ID of any other group (for example, of group `sapsys`) used during the installation. For example, if you want to install an additional application server instance for an existing SAP system, you must make sure that the group ID of group `sapinst` created on the host of the additional application server instance is different from the group ID of any other group on the primary application server instance host of the existing SAP system.

- If you use local operating system user accounts instead of central user management (for example, NIS), users `<sapsid>adm`, `sapadm`, and the database operating system user must have the same password on all hosts.
- If you use local operating system user accounts, make sure that you install your SAP system in *Custom* mode and specify suitable IDs for user `<sapsid>adm` and group `sapsys` on all hosts. The IDs have to be the same on all hosts. If you choose *Typical* mode, you are not asked to specify the user and group IDs.
- If operating system users already exist, make sure that they are assigned to group `sapinst`.
- If you create operating system users manually or use already existing operating system users, make sure that the home directory for each of these users is **not** the root directory (`/`).
- Make sure that the home directory of user `<sapsid>adm` is not critical for recursive changes on permissions. When operating system users are created by the installer, the permissions on the home directories of these users are changed recursively. This can cause unpredictable errors if you define a critical home directory. For example, the home directory must **not** be `/usr/sap`.

Only valid for 'Platform': HP-UX

To prevent terminal query errors in the `<sapsid>adm` environment, comment out the line `eval 'tset -s -Q -m ':?hp'` in the `/etc/skel/.login` script. For more information, see SAP Note [1038842](#).

End of 'Platform': HP-UX

Operating System Users and Groups

The installer 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 host of the primary application server instance.

If you have multiple operating system users with user ID (UID) 0, you must assign the `sapinst` group to all of them.

Table 22: SAP System Users and Groups

User	Primary Group	Additional Groups	Comment
<code>root</code>	No primary group assigned by the installer.	<code>sapinst</code>	Superuser of the UNIX operating system
<code><sapsid>adm</code>	<code>sapsys</code>	<code>oper, dba, sapinst</code> The following groups are always required for Oracle 12, but for Oracle 11 only if you want to use Oracle ASM: <code>asmoper, asmdba</code>	SAP system administrator and for Oracle 12 the default database administrator
<code>ora<dbsid></code>	<code>dba</code>	<code>oper, sapinst, oinstall</code>	Database administrator This user is only required on the host where the database instance runs.

User	Primary Group	Additional Groups	Comment
oracle	dba	oper, sapinst, asmoper, asmadmin, asmdba, oinstall	<p>Oracle Software Owner and database administrator</p> <p>This user is only required on the host where the database instance runs.</p> <p>This user is only required for Oracle 12 or Oracle 11 with ASM/Exadata.</p>

Table 23: SAP System Groups and Members

Groups	Members
sapsys	<sapsid>adm
oper	<sapsid>adm, ora<dbid>, oracle (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM)
dba	<sapsid>adm, ora<dbid>, oracle (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM)
sapinst	root, <sapsid>adm, ora<dbid>, oracle (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM)
asmoper	<sapsid>adm (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM), oracle
asmadmin	oracle (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM)
asmdba	<sapsid>adm (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM), oracle
oinstall (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM)	oracle (always required for Oracle 12; for Oracle 11 only required if you want to use Oracle ASM), ora<dbid>

SAP Host Agent:

Table 24: User and Groups of the SAP Host Agent

User	Primary Group	Additional Group	Comment
sapadm	sapsys	-	<p>SAP Host Agent administrator</p> <p>i Note</p> <p>If <code>sapadm</code> does not exist, it is created during the SAP Host Agent installation using <code>/bin/false</code> shell.</p> <p>Make sure that <code>/bin/false</code> can be used as a login shell.</p> <p>Only valid for 'Platform': AIX</p> <p>Add <code>/bin/false</code> to the list of valid login shells (attribute <code>shells</code>) in <code>/etc/security/login.cfg</code>.</p> <p>End of 'Platform': AIX</p>

Table 25: Groups and Members of the SAP Host Agent User

Groups	Members
sapsys	sapadm
sapinst	sapadm

4.3 Required File Systems and Directories

The following sections 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:

i Note

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

- [SAP Directories \[page 75\]](#)
- [Performing Switchover Preparations for High Availability \[page 87\]](#)
- [Oracle Directories \[page 80\]](#)
- [Setting Up File Systems for High-Availability \[page 84\]](#)

4.3.1 SAP Directories

Depending on the installation option you have chosen, the installer automatically creates the directories listed in the following figures and tables. Before running the installation, you have to set up the required file systems manually. In addition, you have to make sure that the required disk space for the directories to be installed is available on the relevant hard disks.

The installer creates the following types of directories:

- Physically shared directories
- Logically shared directories
- Local directories

HP-UX: For recommendations about block size and mount option configuration, see SAP Note [1077887](#).

Directories of the SAP System

The figure below assumes that you have set up one file system for the SAP system mount directory `<sapmnt>` and one file system for the `/usr/sap` directory. However, you have to decide for which directories you want to set up separate file systems. If you do not set up any file system on your installation host, the installer creates all directories in the root directory (`/`).

The installer prompts you only for the `<sapmnt>` directory during the installation.

The following figures show the directory structure of SAP systems based on SAP NetWeaver 7.5 and the directory structure of SAP systems based on SAP NetWeaver 7.1 to 7.4:

- **Directory Structure for an ABAP System Based on SAP NetWeaver 7.5:**
In SAP systems based on SAP NetWeaver 7.5, all application server instances, including the primary application server instance, are named `D<Instance_Number>`.

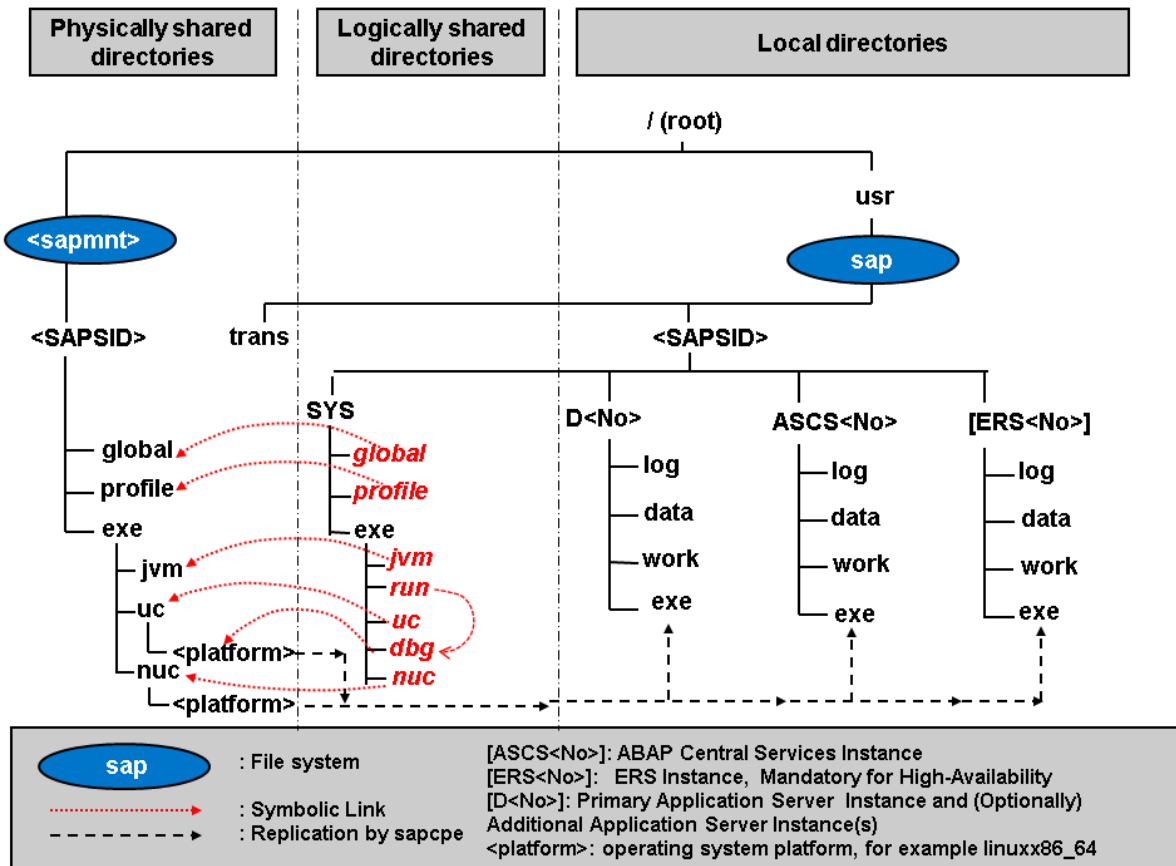


Figure 11: Directory Structure for an ABAP System Based on SAP NetWeaver 7.5

• **Directory Structure for an ABAP System Based on SAP NetWeaver 7.1 to 7.4:**

In SAP systems based on SAP NetWeaver 7.1 to 7.4 the primary application server instance is named DVEBMGS<Instance_Number>.

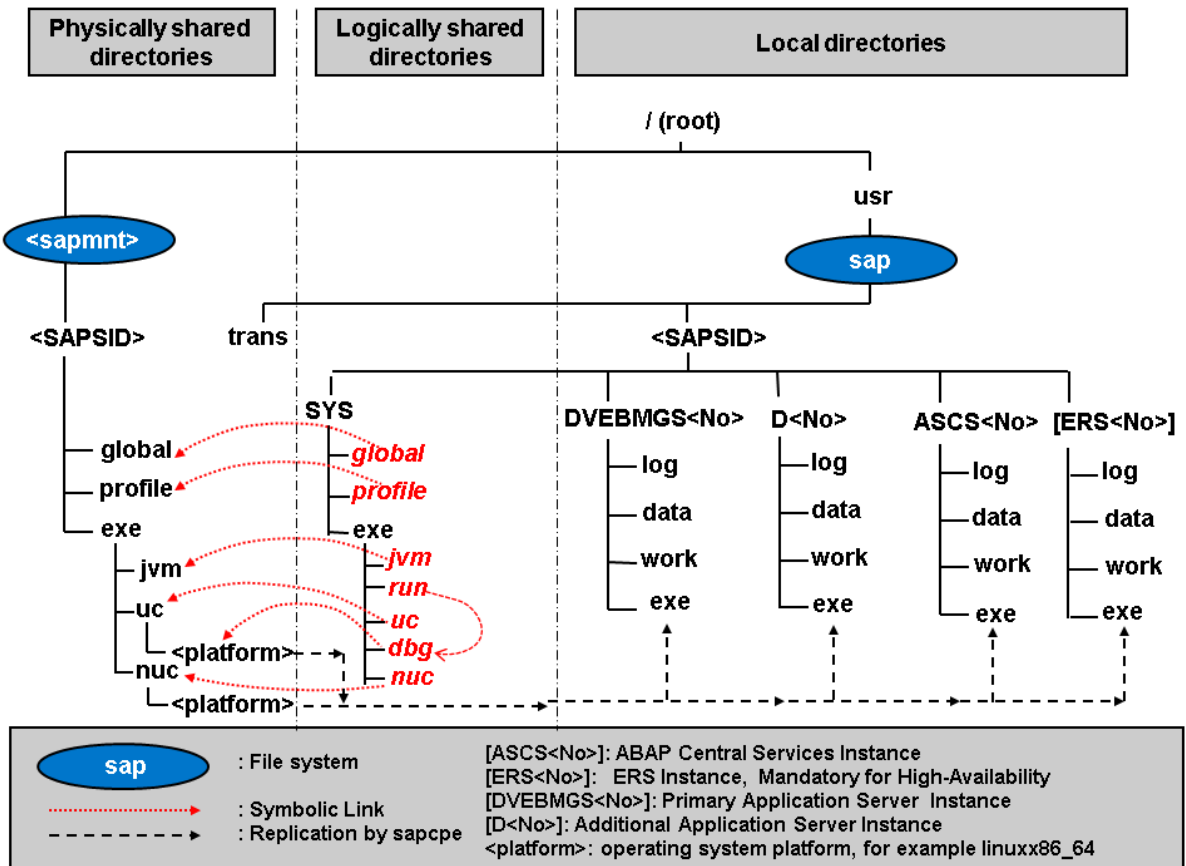


Figure 12: Directory Structure for an ABAP System Based on SAP NetWeaver 7.1 to 7.4

Every new installation of an ABAP standalone system is Unicode (directory *uc* – Unicode).

Physically Shared Directories (SAP System)

Physically shared directories reside on the global host and are shared by Network File System (NFS). The installer 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 such as a high-availability system or a system with additional application server instances – mount it from the other installation hosts.

The installer creates the following shared subdirectories in `/<sapmnt>/<SAPSID>` during the SAP system installation. If you install an SAP system with instances distributed over several hosts, you have to share these directories for all hosts with the same operating system (see [Exporting and Mounting Global Directories \[page 106\]](#)):

- `global`
Contains globally shared data
- `profile`
Contains the profiles of all instances
- `exe`

- Contains a folder `uc` and a folder `nuc`, each with a platform-specific subfolder:
 - `<sapmnt>/<SAPSID>/exe/uc/<platform>` is used in Unicode systems. Executable kernel programs are replicated from this directory to the `exe` directories of each Unicode system instance.
 - `<sapmnt>/<SAPSID>/exe/nuc/<platform>` is used in non-Unicode systems (see below). Executable kernel programs are replicated from this directory to the `exe` directories of each non-Unicode system instance (see below).
- Contains a folder `jvm` with the SAP JVM files
- 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 relevant application server instance. Otherwise, the installer creates `/usr/sap/trans` locally. For more information, see [Exporting and Mounting the Global Transport Directory \[page 105\]](#).

Table 26: Physically Shared SAP Directories

Directory	Required Minimum Disk Space
<code>/<sapmnt>/<SAPSID></code>	Minimum 2.5 GB
<code>/usr/sap/trans</code>	<p>This value heavily depends on the use of your SAP system.</p> <p>For production systems, we recommend to use as much free space as available (at least 2 GB), because the space requirement normally grows dynamically.</p> <p>For the installation, it is sufficient to use 2 GB for each SAP system instance. You can enlarge the file system afterwards.</p>

Logically Shared Directories (SAP System)

Logically shared directories reside on the local hosts with symbolic links to the global host. The installer creates the directory `/usr/sap/<SAPSID>/SYS` on each host.

This directory contains the following symbolic links to physically shared directories:

- Symbolic link `profile` points to `/<sapmnt>/<SAPSID>/profile`
- Symbolic link `global` points to `/<sapmnt>/<SAPSID>/global`

This directory contains the `exe` subdirectory with symbolic links pointing to the corresponding subdirectories of `/<sapmnt>/<SAPSID>/exe` on the SAP global host:

- Symbolic link `uc` (for Unicode) points to `/<sapmnt>/<SAPSID>/exe/uc`
- Symbolic link `nuc` (for non-Unicode) points to `/<sapmnt>/<SAPSID>/exe/nuc`
- Symbolic link `run` points to another symbolic link `/usr/sap/<SAPSID>/SYS/exe/dbg` in the same directory, and symbolic link `dbg` finally points to `/<sapmnt>/<SAPSID>/exe/uc/<platform>`

Whenever a local instance is started, the `sapcpe` program checks the executables against those in the logically shared directories and, if necessary, replicates them to the local instance.

The installer uses `sapcpe` to replicate the kernel automatically from `/usr/sap/<SAPSID>/SYS/exe/run/DIR_CT_RUN` to `/usr/sap/<SAPSID>/<INSTANCE>/exe/DIR_EXECUTABLE` for each SAP system instance.

Local Directories (SAP System)

The installer also creates local directories that reside on the local hosts. 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:

- SYS

i Note

The subdirectories of `/usr/sap/<SAPSID>/SYS` have symbolic links to the corresponding subdirectories of `/<sapmnt>/<SAPSID>`, as shown in the figure above.

- Instance-specific directories with the following names:
 - **SAP systems based on SAP NetWeaver 7.1 to 7.4:**
 - The directory of the primary application server instance is called `DVEBMGS<Instance_Number>`.
 - The directory of an additional application server instance is called `D<Instance_Number>`.
 - **SAP systems based on SAP NetWeaver 7.5:** The directory of an application server instance (primary application server instance and additional application server instances) is called `D<Instance_Number>`.
- The directory of the ABAP central services instance (ASCS) instance is called `ASCS<Instance_Number>`.
- The directory of an enqueue replication server instance (ERS) instance is called `ERS<Instance_Number>`.
If you install a high-availability system, you must install an ERS instance for the ASCS instance.

Table 27: Local SAP Directories

Directory	Description	Required Minimum Disk Space
SAP systems based on SAP NetWeaver 7.1 to 7.4: <code>/usr/sap/<SAPSID>/</code> <code>DVEBMGS<Instance_Number></code>	Primary application server instance directory	<ul style="list-style-type: none"> • SAP Business Warehouse server only: minimum 25 GB • Other installations: minimum 4 GB
SAP systems based on SAP NetWeaver 7.5: <code>/usr/sap/<SAPSID>/D<Instance_Number></code>	Additional application server instance directory	<ul style="list-style-type: none"> • SAP Business Warehouse server only: minimum 25 GB • Other installations: minimum 4 GB
<code>/usr/sap/<SAPSID>/</code> <code>ASCS<Instance_Number></code>	ABAP central services (ASCS) instance directory (high availability only)	Minimum 2 GB
<code>/usr/sap/<SAPSID>/ERS<Instance_Number></code>	Enqueue replication server (ERS) instance directory for the ASCS (high availability only)	Minimum 2 GB

Directories of the SAP Host Agent

The SAP Host Agent has only local directories as shown in the following figure:

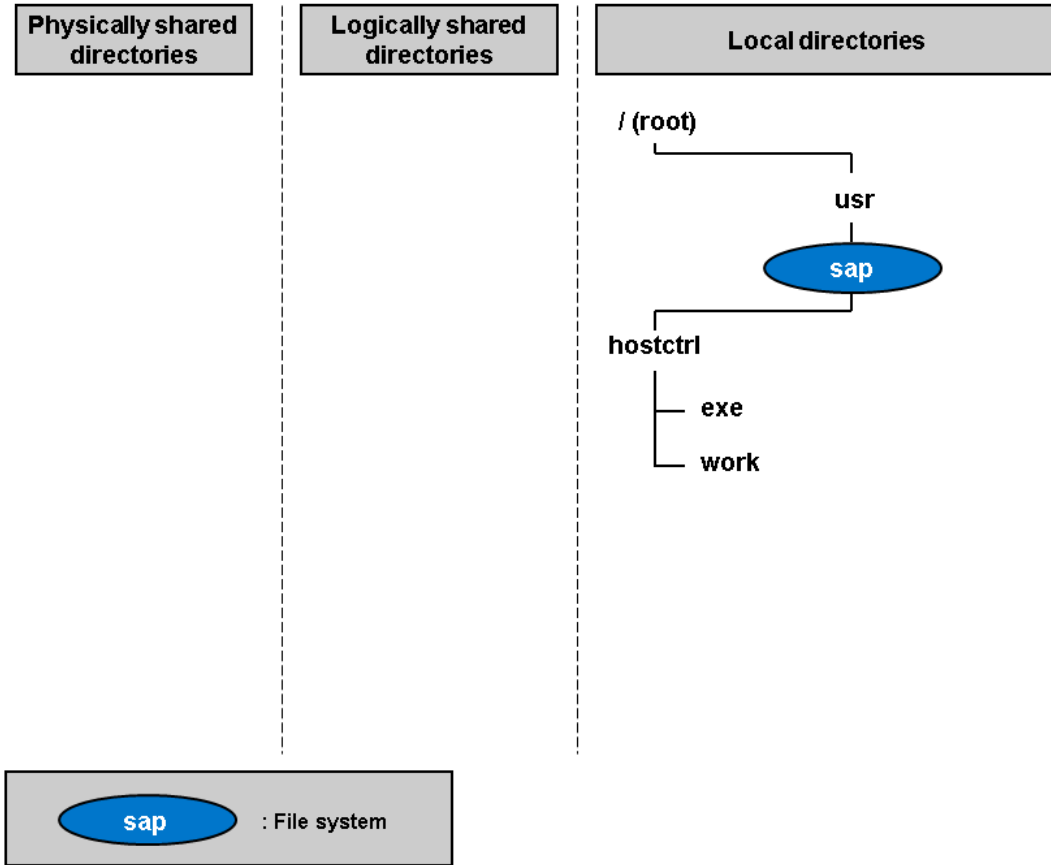


Figure 13: Directory Structure for the SAP Host Agent

Local Directories (SAP Host Agent)

The SAP Host Agent directory `/usr/sap/hostctrl` requires 100 MB of disk space. It contains the following subdirectories:

- `exe`
Contains the profile `host_profile`
- `work`
Working directory of the SAP Host Agent

4.3.2 Oracle Directories

The figure below assumes that you have set up one file system for the `ORACLE` directory. However, you have to decide yourself for which directories you want to set up separate file systems. If you do not set up any file system on your installation host, the installer creates all directories in the `root` directory `/`.

Set up the required file system nodes for the Oracle database before the installation.

i Note

The graphics and the table below only list the directories you need to take into consideration for your SAP system installation. They do not provide a complete list of all Oracle directories.

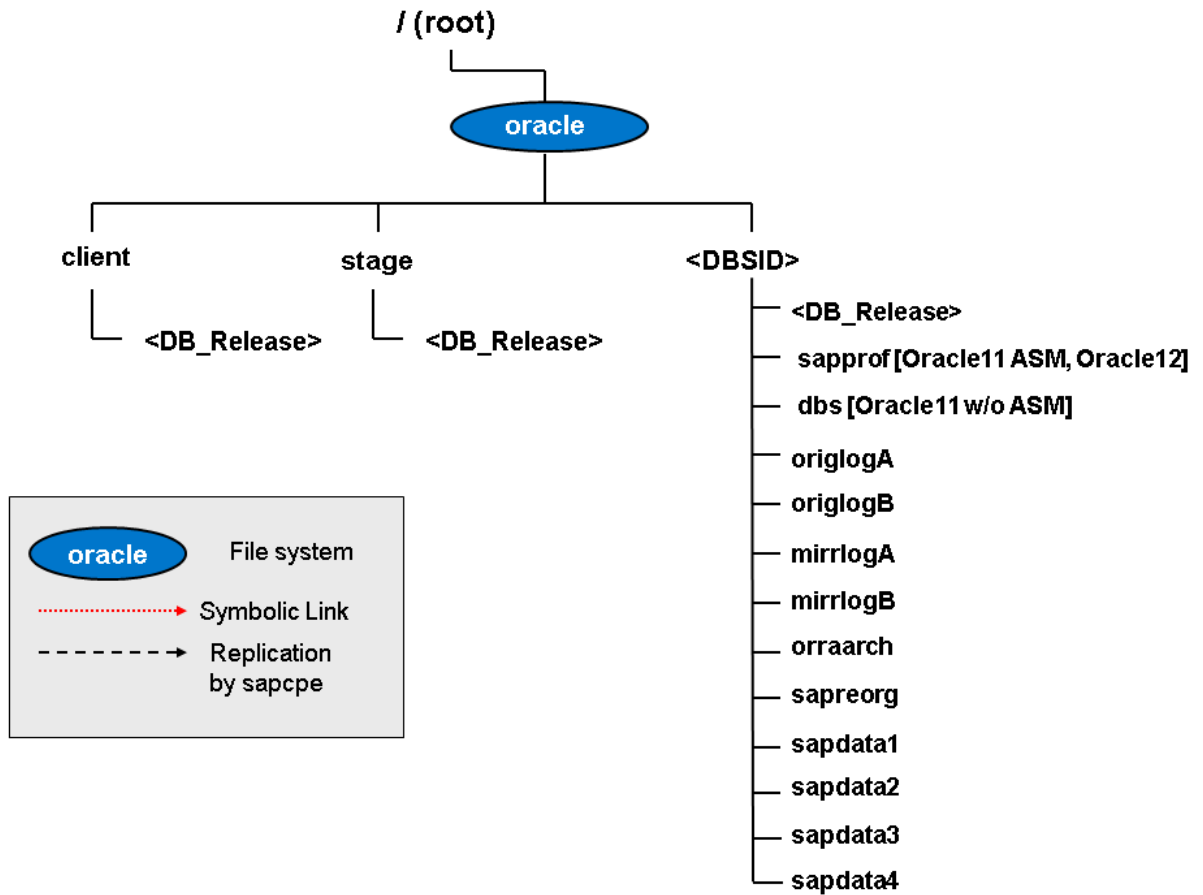





Figure 14: Oracle Directories (Graphical Overview)

The following table provides more information about the Oracle directories in detail, such as about their usage and disk space requirements.

Table 28: Oracle Directories in Detail

Directory	Description	Required Minimum Disk Space
/oracle	Oracle base directory Make sure that the /oracle file system has the permissions 755.	37 GB

Directory	Description	Required Minimum Disk Space
<code>/oracle/client/</code> <code><DB_Release></code>	<p>File system for Oracle client software</p> <p>The installer creates directory <code>/oracle/client/</code> <code><DB_Release>/instantclient</code> during the installation.</p> <p> Example</p> <p>Oracle 11: <code>/oracle/client/11x_64</code></p> <p>Oracle 12: <code>/oracle/client/12x</code></p>	100 MB
<code>/oracle/stage/</code> <code><DB_Release></code>	<p>Installation and upgrade directory for database software (staging area)</p> <p>This directory is also used for Oracle upgrades. We recommend that you do not delete it after the installation.</p> <p> Example</p> <p>Oracle 11: <code>/oracle/stage/112_64</code></p> <p>Oracle 12: <code>/oracle/stage/121</code></p>	11 GB
<p>Oracle 11 only:</p> <code>/oracle/<DBSID></code>	<p>Home directory of user <code>ora<dbsid></code></p> <p>We recommend that <code>/oracle/<DBSID></code> does not reside in the root directory. It must reside in a file system with support for large files.</p> <p>Therefore, either create <code>/oracle/<DBSID></code> as a separate file system with support for large files or create <code>/oracle</code> as a file system with support for large files and create <code>/oracle/<DBSID></code> as a directory in <code>/oracle</code>.</p>	100 MB for files of user <code>ora<dbsid></code> (for example, log files)
<p>Oracle 12 only:</p> <code>/home/oracle</code> <code>/home/ora<dbsid></code>	<p>Home directories of user <code>Oracle</code> and user <code>ora<dbsid></code></p>	<p>100 MB for files of user <code>ora<dbsid></code> (for example, log files)</p> <p>100 MB for files of user <code>Oracle</code> (for example, log files)</p>

Directory	Description	Required Minimum Disk Space
<code>/oracle/<DBSID>/<DB_Release></code>	Home directory for Oracle instance <code><DBSID></code> (<code><ORACLE_HOME></code>). <div style="background-color: #fff9c4; padding: 5px;"> <p> Example</p> <p>Oracle 11: <code>/oracle/KB1/112_64</code></p> <p>Oracle 12: <code>/oracle/KB1/121</code></p> </div>	<ul style="list-style-type: none"> Database instance: 4.0 GB All other instances: 200 MB
Oracle 11 with ASM and Oracle 12 only: <code>/oracle/<DBSID>/sapprof</code>	If your database version is Oracle 12 or if you have Oracle 11 with ASM, in this directory the <code>init<DBSID>.ora</code> and the <code>spfile<DBSID>.ora</code> files are stored, and the <code>init<DBSID>.sap</code> profile for the Oracle dba tools.	1 MB
Oracle 11 without ASM only: <code>/oracle/<DBSID>/dbs</code>	If your database version is Oracle 11 and you do not have ASM, in this directory the <code>init<DBSID>.ora</code> and the <code>spfile<DBSID>.ora</code> files are stored, and the <code>init<DBSID>.sap</code> profile for the Oracle dba tools.	1 MB
<code>/oracle/<DBSID>/origlogA</code>	Original set A of redo logs	200 MB
<code>/oracle/<DBSID>/origlogB</code>	Original set B of redo logs	200 MB
<code>/oracle/<DBSID>/mirrlogA</code>	Mirrored set A of redo logs	200 MB
<code>/oracle/<DBSID>/mirrlogB</code>	Mirrored set B of redo logs	200 MB
<code>/oracle/<DBSID>/oraarch</code>	New standard backup file system for Oracle offline redo logs Use a separate disk for the file system <code>/oracle/<DBSID>/oraarch</code> . The file system <code>/oracle/<SAPSID>/saparch</code> still remains but now only contains <code>brbackup</code> log files. <code>/oracle/<SAPSID>/saparch</code> is automatically created by the installer.	For the installation, the archive directory <code>/oracle/<DBSID>/oraarch</code> requires at least 400 MB free disk space. For the operation of your SAP system, we recommend that the archive directory provides enough space for archives between two backups. In a production system, the amount archived each day is between 300 MB and 1 GB.
<code>/oracle/<DBSID>/sapreorg</code>	Working directory for database administration	1.5 GB
<code>/oracle/<DBSID>/sapdata1</code>	SAP data	24 GB
<code>/oracle/<DBSID>/sapdata2</code>	SAP data	For details, see the <code>DBSIZE.XML</code> file at the medium for the installation export (folder <code>EXP1/DB/ORA/</code>)
<code>/oracle/<DBSID>/sapdata3</code>	SAP data	

Directory	Description	Required Minimum Disk Space
<code>/oracle/<DBSID>/sapdata4</code>	SAP data	See also the <i>Pre-Installation</i> section in SAP Note 2172935 .

4.3.3 Setting Up File Systems for a High-Availability System

Use

Third-party technology is used to make the SAP directories available to the SAP system. The technologies of choice are NFS, shared disks, and cluster file system. If you have decided to use a high-availability (HA) solution for your SAP system, make sure that you properly address the HA requirements of the SAP file systems in your SAP environment with the HA partner of your choice.

From the perspective of an SAP application, there are the following types of [SAP Directories \[page 75\]](#):

- Physically shared directories: `<sapmnt>/<SAPSID>` and `/usr/sap/trans`
- Logically shared directories that are bound to a node such as `/usr/sap` with the following local directories:
 - `/usr/sap/<SAPSID>`
 - `/usr/sap/<SAPSID>/SYS`
 - `/usr/sap/hostctrl`
- Local directories that contain the SAP instances such as `/usr/sap/<SAPSID>/ASCS<Instance_Number>`

Only valid for 'Platform': HP-UX

HP-UX: For recommendations about block size and mount option configuration, see SAP Note [1077887](#).

End of 'Platform': HP-UX

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 \[page 65\]](#) and contact your HA partner.

Procedure

1. Create the file systems or raw partitions for the SAP instances you can switch over in such a way that the content can be made available to all nodes that can run the service. At least the ABAP central services (ASCS) instance must be part of the switchover cluster.

The SAP directories `<sapmnt>/<SAPSID>` and `/usr/sap/trans` are usually mounted from a Network File System (NFS). However, an SAP instance directory `/usr/sap/<SAPSID>/`

<Instance_Type><Instance_Number> that you want to prepare for HA has to be always mounted on the cluster node currently running the instance. Do **not** mount such directories 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 for /sapmnt/<SAPSID> and /usr/sap/trans on **different** physical disks from the file system for /usr/sap/<SAPSID>/<Instance_Type><Instance_Number>.

Caution

To start or stop an SAP instance, you have to do one of the following:

- Make the physically shared SAP directories under /<sapmnt>/<SAPSID>/ available to the server beforehand.
- Replace the links in /usr/sap/<SAPSID>/SYS by a physical copy.
Consult your HA partner to clarify the best solution for the cluster software.

2. Use the following approach for the file system for the /usr/sap/<SAPSID> directory:

The /usr/sap/<SAPSID> directory contains at least two subdirectories (see also [SAP Directories \[page 75\]](#)):

- SYS, which contains links to the central directory /sapmnt/<SAPSID>
- <Instance_Type> <Instance_Number> – where the name is defined by the type of services and the application server number:
 - DVEBMGS<Instance_Number> – which contains data for the primary application server instance
 - D<Instance_Number> – which contains data for an additional application server instance
 - ASCS<Instance_Number> – which contains data for the ABAP central services instance

Only <Instance_Type><Instance_Number> directories need to be migrated with the SAP instances during the switchover.

Therefore, instead of /usr/sap/<SAPSID>, create a file system for /usr/sap/<SAPSID>/<Instance_Type><Instance_Number> with the usual <> substitutions.

The instance-specific directory name for the ABAP central services instance is normally ASCS<Instance_Number>. Migrating only these directories avoids mount conflicts when switching over to a node on which another application server instance is already running. The ASCS<Instance_Number> 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. Use this approach for integrated installations of the application server with ABAP and Java stacks.

3. You assign the **local** (not switching) file systems to **permanent** mount points.
4. You assign the **shared** file systems as documented by your HA partner.

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.

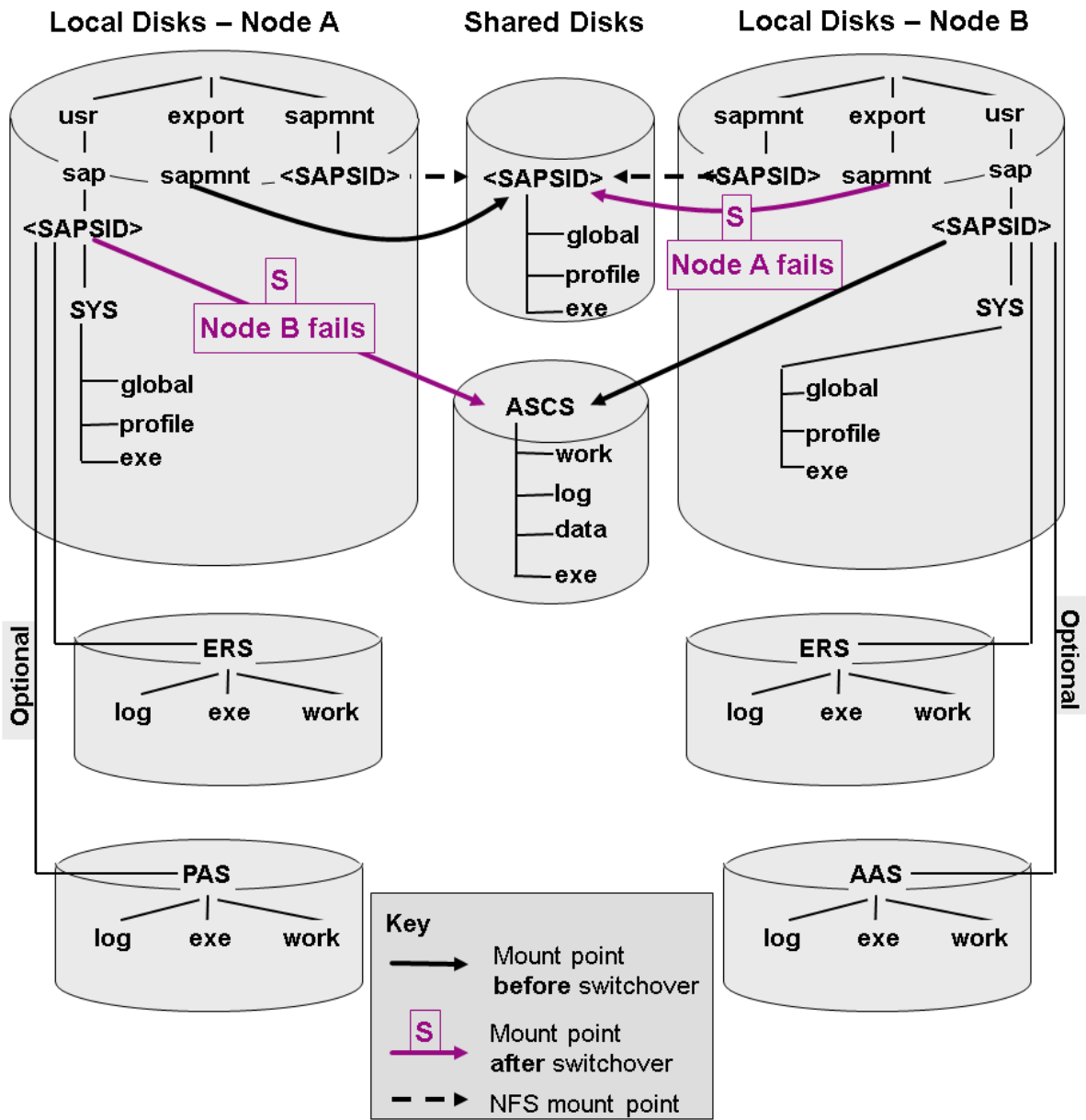


Figure 15: File Systems and Disks in an HA Setup

4.4 Using Virtual Host Names

You can use one or more virtual `TCP/IP` host names for SAP servers within an SAP server landscape to hide their physical network identities from each other. This can be useful when quickly moving SAP servers or complete server landscapes to alternative hardware since you do not need to reinstall or reconfigure.

Only valid for 'High Availability': HA (UNIX)

If you want to install a [high-availability \(HA\) system \[page 18\]](#), you need the virtual host name when you install the ASCS instance in a cluster.

End of 'High Availability': HA (UNIX)

Prerequisites

Make sure that the virtual host name can be correctly resolved in your Domain Name System (DNS) setup.

Procedure

Proceed as described in SAP Note [962955](#).

4.5 Performing Switchover Preparations for High Availability

This topic is only valid for 'High Availability': HA (UNIX)

Use

To be able to use the required [virtual host names \[page 87\]](#), you have to set the installer property `SAPINST_USE_HOSTNAME` to specify the required virtual host name before you start the installer. Alternatively you can specify the virtual host name in the relevant field on the respective instance screen.

For more information, see [SAP System Parameters \[page 48\]](#).

Procedure

Assign the virtual IP addresses and host names for the ASCS instance, and (if required) NFS to appropriate failover groups.

i Note

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

Special Requirements for ASCS / SCS on z/OS

When installing a central services instance on z/OS, you must always set the `zscsinst` property `VIRTUALHOST`.

End of 'High Availability': HA (UNIX)

4.6 Installing the SAP Front-End Software

Before you start the installation, make sure that the SAP front-end software is installed on at least **one** computer in your system environment to be able to log on to the SAP system after the installation has finished.

Procedure

1. Check SAP Note [147519](#) for the recommended SAP front-end release.
2. Install the SAP front-end software required for your SAP system release as described in the documentation *SAP Frontend Installation Guide* - <Release> at: <http://scn.sap.com/docs/DOC-25456>

4.7 Preparing the Installation Media

This section describes how to prepare the installation media.

Installation media are available as follows:

- The Software Provisioning Manager 1.0 archive containing the installer.
You always have to download the latest version of the Software Provisioning Manager 1.0 archive.
- The complete media or dedicated installation archives (`SAR` files) containing the software to be installed, which are available as follows:
 - You can use the physical installation media as part of the installation package as described in *Using the Physical Media from the Installation Package* (see the *Related Information* section below).
 - You download the complete installation media as described in *Downloading the Complete Installation Media* (see the *Related Information* section below).
 - As an alternative to downloading the complete SAP kernel media, you can do one of the following:
 - Download the **SAP kernel archives** (`SAR` files), as described in *Downloading Specific Installation Archives (Archive-Based Installation)* (see the *Related Information* section below).
 - Use the **SAP kernel archives** (`SAR` files) of an existing SAP system, for example the SAP kernel archives from the source system if you are performing a system copy and run the target system

installation (see *Creating Kernel Archives from an Existing SAP System* in the *Related Information* section below).

i Note

Even if you use the complete SAP kernel media, the installer might prompt you during the provisioning process for additional archives (*.SAR files) due to special Patch Level (PL) requirements depending on categories such as the product, operating system, and database platform. at the end of this section.

For example: The installer might require a certain PL of <X> of the SAPEXEDB.SAR (for DBTYPE <Y>), but this PL of the SAPEXEDB.SAR is not contained in the SAP kernel media. In this case you have to download the required PL from <http://support.sap.com/swdc> following the instructions given in section *Downloading Specific Installation Archives (Archive-Based Installation)* below.

i Note

If you are using a stack configuration file (see [at the end Installation Using a Stack Configuration File \(Optional\) \[page 30\]](#)), you have the installation media defined when generating the Landscape Plan. The media link provided in the Landscape Plan guides you to the location in the SAP Software Download Center at <http://support.sap.com/swdc> where you can download the installation media required for your SAP product, operating system and database.

For more information about which kernel version to use, see SAP Note [1680045](#). In addition, check the Product Availability Matrix at: <http://support.sap.com/pam>.

We also recommend that you read the document *Understanding Kernel Releases for the SAP NetWeaver AS ABAP* at <http://scn.sap.com/docs/DOC-54170>.

The installer requests the related kernel media during the corresponding procedure. For more information about release and road map information around the kernel versions and their relationship to SAP NetWeaver support packages including important notes on downward compatibility and release dates, see the document *Understanding Kernel Releases for the SAP NetWeaver AS ABAP* at <http://scn.sap.com/docs/DOC-54170>.

Related Information

[Downloading the Software Provisioning Manager Archive \[page 90\]](#)

[Using the Physical Media from the Installation Package \[page 91\]](#)

[Creating Kernel Archives from an Existing SAP System \[page 95\]](#)

[Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 93\]](#)

[Downloading the Complete Installation Media \[page 96\]](#)

4.7.1 Downloading the Software Provisioning Manager Archive

You always have to download and unpack the Software Provisioning Manager 1.0 archive (SWPM10SP<Support_Package_Number>_<Version_Number>.SAR) from the SAP Software Download Center because you must use the latest version.

Prerequisites

Make sure the latest version of the SAPCAR archiving tool is available on each installation host.

You require the SAPCAR archiving tool to be able to unpack software component archives (*.SAR files), which is the format of software lifecycle media and tools that you can download from the SAP Software Download Center.

If required, you can download the latest version of SAPCAR from:

<http://support.sap.com/swdc> > Support Packages and Patches > Software Downloads > SUPPORT PACKAGES & PATCHES > By Alphabetical Index (A-Z) > S > SAPCAR

For more information about SAPCAR, see SAP Note [212876](#).

Procedure

1. Download the latest version of the Software Provisioning Manager 1.0 archive SWPM10SP<Support_Package_Number>_<Version_Number>.SAR from:

<http://support.sap.com/swdc> > Support Packages and Patches > Software Downloads > SUPPORT PACKAGES & PATCHES > By Alphabetical Index (A-Z) > S > SOFTWARE PROVISIONING MANAGER

Note

If you have an operating system version that has been initially released with SAP kernel 7.2<x> but is no longer supported for SAP kernel 7.40 and higher, instead of the SWPM*.SAR archive you must download the RMOSSWPM*.SAR archive for these outdated operating system versions. For more information, see [Constraints \[page 8\]](#)

2. Unpack the Software Provisioning Manager archive to a local directory using the following command:

```
SAPCAR -xvf <Path_To_Download_Directory>/<Archive>.SAR -R <Unpack_Directory>
```

Note

Make sure that all users have read permissions for the directory where you want to unpack the installer.

Caution

Make sure that you unpack the Software Provisioning Manager archive to a dedicated folder. Do not unpack it to the same folder as other installation media.

4.7.2 Using the Physical Media from the Installation Package

This section describes how you use the physical installation media as part of the installation package.

Procedure

1. Identify the required media [for your installation \[page 16\]](#) as listed below.

Table 29:

SAP Instance Installation	Required Software Packages from Installation Media
ABAP Central services instance (ASCS instance)	<ul style="list-style-type: none"> ○ Software Provisioning Manager 1.0 archive ○ UC or NUC Kernel (folder <code>K_<Version>_<N or U>_<OS></code>) where <code>U</code> means Unicode and <code>N</code> means non-Unicode. <div style="background-color: #fff9c4; padding: 10px; margin-top: 10px;"> <p>i Note</p> <p>Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release.</p> </div>
Database instance	<ul style="list-style-type: none"> ○ Software Provisioning Manager 1.0 archive ○ UC or NUC Kernel (folder <code>K_<Version>_<N or U>_<OS></code>) where <code>U</code> means Unicode and <code>N</code> means non-Unicode. <div style="background-color: #fff9c4; padding: 10px; margin-top: 10px;"> <p>i Note</p> <p>Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release.</p> </div> <ul style="list-style-type: none"> ○ Database software ○ Database patches (if available) ○ Installation Export (folders <code>EXP*</code>) ○ SAP NetWeaver AS for Java Component (folders <code>JAVA_*</code>) <div style="background-color: #fff9c4; padding: 10px; margin-top: 10px;"> <p>i Note</p> <p>For an MCODE system you require the database client software instead of the database software and the database patches (if available).</p> </div>

SAP Instance Installation	Required Software Packages from Installation Media
Enqueue Replication Server	<ul style="list-style-type: none"> Software Provisioning Manager 1.0 archive UC or NUC Kernel (folder $\kappa_{<Version>_{<N \text{ or } U}<OS>}$) where U means Unicode and N means non-Unicode. <p>i Note</p> <p>Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release.</p>
Primary application server instance	<ul style="list-style-type: none"> Software Provisioning Manager 1.0 archive UC or NUC Kernel (folder $\kappa_{<Version>_{<N \text{ or } U}<OS>}$) where U means Unicode and N means non-Unicode. <p>i Note</p> <p>Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release.</p> <ul style="list-style-type: none"> Only valid for 'Software Component': SAP SCM SAP liveCache End of 'Software Component': SAP SCM Database Client Software CLI Driver / JDBC Driver
Additional application server instance	<ul style="list-style-type: none"> Software Provisioning Manager 1.0 archive UC or NUC Kernel (folder $\kappa_{<Version>_{<N \text{ or } U}<OS>}$) where U means Unicode and N means non-Unicode. <p>i Note</p> <p>If you install an additional application server instance in an existing non-Unicode system, the additional application server instance is created automatically as a non-Unicode instance. The installer checks whether a non-Unicode system exists and chooses the right executables for the system type.</p> <ul style="list-style-type: none"> Only valid for 'Software Component': SAP SCM SAP liveCache End of 'Software Component': SAP SCM Database Client Software

Table 30: SAP Host Agent (Separate Installation Only)

SAP Instance Installation	Required Media
SAP Host Agent (separate installation only)	<ul style="list-style-type: none"> Software provisioning manager 1.0 archive UC Kernel (folder $\kappa_{<Version>_U_{<OS>}$) where U means Unicode.

2. Make the installation media available on each installation host as follows:
 - a. Download and unpack the latest version of Software Provisioning Manager as described in [Downloading the Software Provisioning Manager Archive \[page 90\]](#).
 - b. Make the media containing the software to be installed available.

You can do this in one of the following ways:

- Copy the required media folders directly to the installation hosts.
- Mount the media on a central media server that can be accessed from the installation hosts.

Caution

























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

3. If you want to perform target system installation in the context of a **heterogeneous system copy** you need a migration key. You can generate it at <http://support.sap.com/migrationkey>.

4.7.3 Downloading SAP Kernel Archives (Archive-Based Installation)

As an alternative to downloading the complete SAP kernel media, you can also download exactly the SAP kernel archives that are required for your installation. During the installation, you can either specify the path to each archive separately, or provide the path to a download basket with all downloaded archives.

Procedure

1. Download and unpack the latest version of Software Provisioning Manager as described in [Downloading the Software Provisioning Manager Archive \[page 90\]](#).
2. Go to <http://support.sap.com/swdc>   *Software Downloads*  *SUPPORT PACKAGES & PATCHES*  *By Category* 
3. Choose the required software component, release, and technical stack:
 - If you want to install SAP S/4 HANA, on-premise edition 1511, choose  *SAP NetWeaver and complementary products*  *AS ABAP FOR S/4HANA FRONTEND*  *AS ABAP 7.5 FOR S4HANA OP 1511* 
 - If you want to install AS ABAP 7.5 FOR S4HANA OP 1511, choose  *SAP NetWeaver and complementary products*  *SAP NETWEAVER ABAP FOR OEM*  *SAP NW ABAP 7.4 FOR OEM 1.0* 
 - If you want to install SAP NetWeaver Mobile 7.1, choose  *SAP NetWeaver and complementary products*  *SAP NETWEAVER MOBILE*  *<Release>*  *Entry by Component* 
 - If you want to install an SAP NetWeaver system, choose  *SAP NetWeaver and complementary products*  *SAP NetWeaver*  *<Release>*  *[Entry by Component]*  *Application Server ABAP* 

- If you want to install an SAP Business Suite system based on SAP NetWeaver, choose ► *SAP Application Components* ► <SAP CRM | SAP ERP | SAP SCM | SAP SRM> ► <Release> ► *Entry by Component* ► <ABAP Product Instance> ►

4. Choose the required package:

⚠ Caution

- Make sure that you always choose SAPEXE<Version>.SAR, SAPEXEDB<Version>.SAR of the **same** SAP kernel release and extension:

🧩 Example

- If SAPEXE<Version>.SAR is of version **7.42 EXT**, then SAPEXEDB<Version>.SAR must also be of version **7.42 EXT**.
- If SAPEXE<Version>.SAR is of version **7.45**, then SAPEXEDB<Version>.SAR must also be of version **7.45**.

- SAPEXE<Version>.SAR

► *SAP KERNEL* <Version> <UC | NUC> ► <Operating System> ► *#DATABASE INDEPENDENT* ►

i Note

SAP KERNEL <Version> <NUC> is only available for SAP systems based on SAP NetWeaver 7.4 or lower

- If you want to install an SAP system based on SAP NetWeaver 7.5, you can only choose 7.45 UNICODE for *SAP KERNEL* <Version>.
- If you want to install an SAP system based on SAP NetWeaver 7.4, you can choose either 7.45 or 7.42 for *SAP KERNEL* <Version>.
- If you want to install an SAP system based on SAP NetWeaver 7.3 including EHP1 or lower, choose 7.21 EXT for *SAP KERNEL* <Version>

- SAPEXEDB<Version>.SAR

► *SAP KERNEL* <Version> <UC | NUC> ► <Operating System> ► *#DATABASE INDEPENDENT* ►

i Note

SAP KERNEL <Version> <NUC> is only available for SAP systems based on SAP NetWeaver 7.4 or lower

- If you want to install an SAP system based on SAP NetWeaver 7.5, you can only choose 7.45 UNICODE for *SAP KERNEL* <Version>.
- If you want to install an SAP system based on SAP NetWeaver 7.4, you can choose either 7.45 or 7.42 for *SAP KERNEL* <Version>.
- If you want to install an SAP system based on SAP NetWeaver 7.3 including EHP1 or lower, choose 7.21 EXT for *SAP KERNEL* <Version>

- DBATOOLS<Version>.SAR

► *SAP KERNEL* <Version> <UC | NUC> ► <Operating System> ► *Oracle* ►

i Note

`SAP KERNEL <Version> <NUC>` is only available for SAP systems based on SAP NetWeaver 7.4 or lower

- `igsexex<version>.sar`
 - ▶ `SAP IGS <Version> <Operating System>`
 - If you want to install an SAP system based on SAP NetWeaver 7.5 or higher, choose ▶ `SAP IGS 7.45 > # OS independent >`
 - If you want to install an SAP system based on SAP NetWeaver 7.4 and your `SAP EXE<Version>.SAR` is of version **7.45**, then choose ▶ `SAP IGS 7.45 > # OS independent >`. Otherwise, choose ▶ `SAP IGS 7.20_EXT > # OS independent >`
 - If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1, choose ▶ `SAP IGS 7.20_EXT > # OS independent >`
 - If you want to install an SAP system based on SAP NetWeaver 7.3 or lower and use SAP kernel 7.21_EXT, choose ▶ `SAP IGS 7.20_EXT > <Operating System> >`
 - If you want to install an SAP system based on SAP NetWeaver 7.3 or lower and use SAP kernel 7.21, choose ▶ `SAP IGS 7.20 > <Operating System> >`
 - `igshelper<version>.sar`
 - If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1 or higher, choose ▶ `SAP IGS HELPER > # OS independent >`
 - If you want to install an SAP system based on SAP NetWeaver 7.3 or lower, choose ▶ `SAP IGS 7.20 > <Operating System> >`
 - `SAPHOSTAGENT<Version>.SAR`
 - ▶ `SAP HOST AGENT 7.21 > <Operating System> >`
5. If you want to install an SAP system based on SAP NetWeaver 7.3 including EHP1 or lower - that is you have to use SAP kernel 7.21 - download the latest patch level of `SAP CRYPTOLIB <Version>.SAR` from the following path:
- <http://support.sap.com/swdc> ▶ [Support Packages and Patches](#) ▶ [Browse our Download Catalog](#) ▶ [Additional Components](#) ▶ [SAP CRYPTOLIB](#) ▶ [COMMONCRYPTOLIB<Version>](#) ▶ [<Operating System>](#) ▶
6. Make the physical media required for the database installation available either by using physical media as described in [Using the Physical Media from the Installation Package \[page 91\]](#) or by downloading them as described in [Downloading the Complete Installation Media \[page 96\]](#).

4.7.4 Creating Kernel Archives from an Existing SAP System

You can reuse the binaries of a dedicated SAP system for a new SAP system installation from scratch or a target system installation in the context of a SAP system copy by creating `*.SAR` archives based on the `*.lst` files from the executable (`exe`) directories of the source SAP system. When you are prompted for the SAP kernel archives during the SAP system target installation, you can then provide the archives that you prepared before.

Prerequisites

Make sure that you provide a valid and consistent set of binary files that are supported by SAP in the executable (exe) directories of your source SAP system.

Procedure

1. You start the installer.
2. On the *Welcome* screen, choose **>>** [<Product>](#) **>** [<Database>](#) **>** [System Copy](#) **>** [Source System](#) **>** [Based on AS ABAP](#) **>** [Kernel Media Creation](#) **>**
3. You specify a directory for the kernel archives to be created.
4. You select the source SAP system archives that you want to be created and used for another SAP system installation.
5. After you have entered all requested input parameters, the installer displays the *Parameter Summary* screen. This screen shows both the parameters that you entered and those that the installer set by default. If required, you can revise the parameters before starting the installation.
6. Choose Next to start the extraction of the selected archives.

Related Information

[Running the Installer \[page 110\]](#)

4.7.5 Downloading the Complete Installation Media

This section describes how you download complete installation media from the SAP Software Download Center.

Procedure




1. Download and unpack the latest version of Software Provisioning Manager as described in [Downloading the Software Provisioning Manager Archive \[page 90\]](#).
2. Create a download directory on the host where you want to run the installer.
3. Identify **all** download objects that belong to one installation medium according to one or both of the following:

i Note

Installation media might be split into several files. In this case, you have to reassemble the required files after the download.

- Download path or location:


You can download installation media from the SAP Software Download Center using one of the following paths:

- <http://support.sap.com/swdc>  [Installations and Upgrades](#) > [Software Downloads](#) > [INSTALLATIONS & UPGRADES](#) > [By Alphabetical Index \(A-Z\)](#) > [<First_Letter_Of_Your_Product>](#) > [<Your_Product>](#) > [<Your_Product_Version>](#) >
- <http://support.sap.com/swdc>  [Installations and Upgrades](#) > [Software Downloads](#) > [INSTALLATIONS & UPGRADES](#) > [By Category](#) > [<Your_Product>](#) > [<Your_Product_Version>](#) >
- For downloading the kernel media, proceed as described in the *Kernel Media* section of SAP Note [1680045](#) .
- Material number
All download objects that are part of an installation medium have the same material number and an individual sequence number:
`<Material_Number>_<Sequence_Number>`

Example

```
51031387_1
51031387_2
...
```

4. Download the objects to the download directory.
5. To correctly re-combine the media that are split into small parts, unpack all parts into the same directory.

In the unpacking directory, the system creates a subdirectory with a short text describing the medium and copies the data into it. The data is now all in the correct directory, the same as on the medium that was physically produced. For more information, see SAP Note [1258173](#) .

Caution

Make sure that you unpack each installation media to a separate folder. Do not unpack installation media to the same folder where you unpack the Software Provisioning Manager archive.

Do not unpack installation media to the same folder where you unpack the SAP kernel archives for archive-based installation.

5 Installation

5.1 Installation Checklist

This section includes the installation steps for the following:

- Standard system
- Distributed system
- High-availability system
- Additional application server instance

Detailed information about the steps is available in the relevant chapter.

Standard System

1. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the SAP system.

i Note

In a standard system, all mandatory instances are installed on one host in one installation run.

i Note

If your database release is Oracle 12c and you want to install it as a container database (CDB) or as a pluggable database PDB in an existing CDB (multitenant database installation), perform the additional steps as described in [Oracle Database 12c Multitenant Database Installation \[page 182\]](#).

2. You continue with [Post-Installation \[page 137\]](#).

Distributed System

1. If you want to share the transport directory `trans` from another system, you have to [mount \[page 105\]](#) it from this system. Otherwise, we recommend that you share the `trans` directory that is created during the installation of the primary application server instance.
2. On the **ASCS instance host**, you do the following:
 1. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the ABAP central services instance (ASCS instance).

i Note

If you want to [install an ASCS instance with integrated SAP Web Dispatcher \[page 24\]](#), you must choose the *Custom* parameter mode.

When processing the screens for the ASCS instance installation, you are prompted to mark a checkbox if you want to install an SAP Web Dispatcher instance with the ASCS instance. If you mark this checkbox, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

2. You [export global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` to the database and primary application server instance host.
3. On the **database instance host**, you do the following:
 1. You [mount the global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host and – optionally – the `trans` directory that you [exported \[page 105\]](#) from the SAP transport host.
 2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the database instance.

i Note

If your database release is Oracle 12c and you want to install it as a container database (CDB) or as a pluggable database PDB in an existing CDB (multitenant database installation), perform the additional steps as described in [Oracle Database 12c Multitenant Database Installation \[page 182\]](#).

3. If you want to install Oracle Real Application Clusters (RAC), proceed as described in [Installing Oracle Real Application Clusters \[page 178\]](#).
4. If you want to install the database instance on Oracle Automatic Storage Management (ASM), proceed as described in [Installing Database Instance on Oracle Automatic Storage Management \[page 181\]](#).
4. On the **primary application server instance host**, you do the following:
 1. You [mount the global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
 2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the primary application server instance.

i Note

If your database release is Oracle 12c, during the installation you need to specify how the application server instance is to connect to a pluggable database or a "normal" database. For more information, see [Installing a Distributed Application Server Instance \[page 184\]](#).

3. If you have installed Oracle Real Application Clusters (RAC), perform the required additional steps for the primary application server instance as described in [Installing Oracle Real Application Clusters \[page 178\]](#).
4. If you want to use the shared transport directory `trans` from another system, you also [mount \[page 105\]](#) this directory.
5. You continue with [Post-Installation \[page 137\]](#).

Graphical Overview

The following figure shows how you install the various instances in a distributed system:

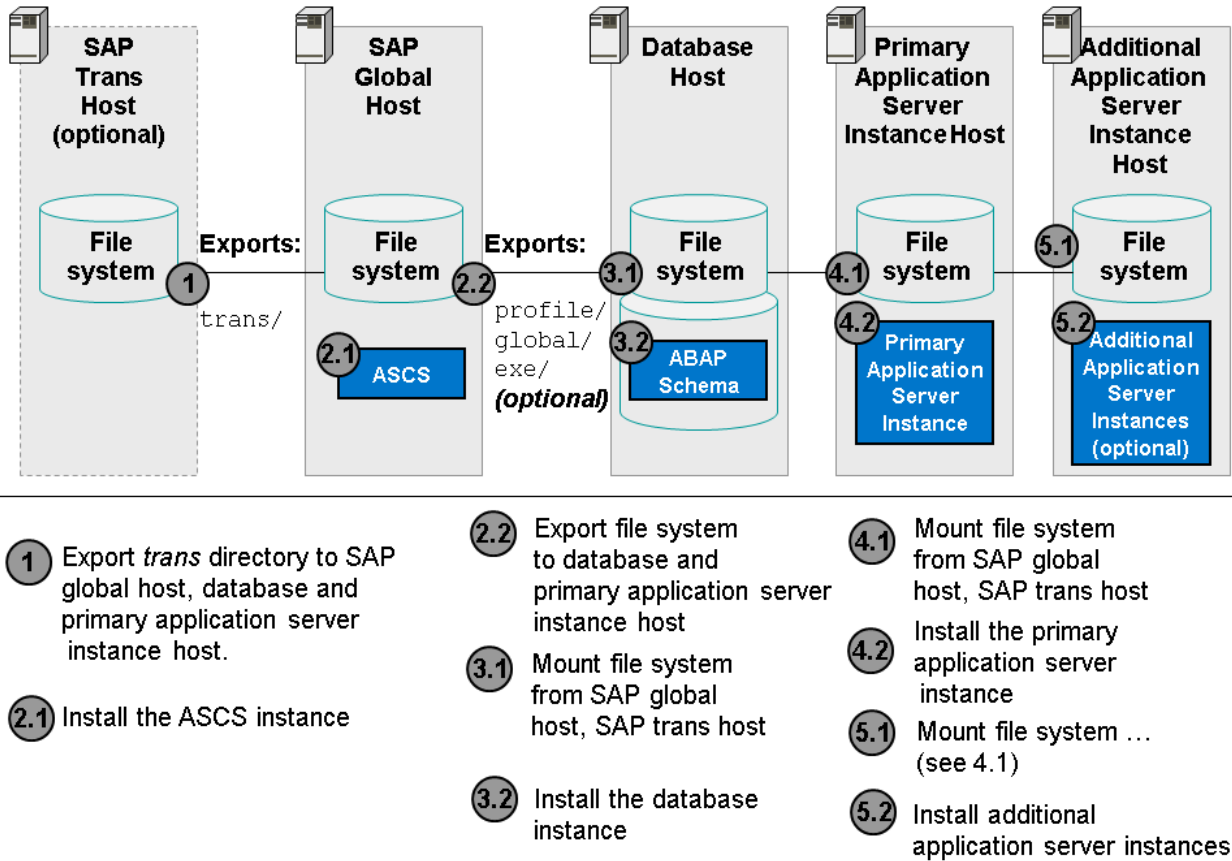


Figure 16: Distribution of Instances in an ABAP System

High-Availability System

1. You make sure that you have already prepared the standby node, **host B**. You ought to have already made sure that it meets the hardware and software requirements and that it has all the necessary file systems, mount points, and (if required) Network File System (NFS).
This is described in [Performing Switchover Preparations for High Availability \[page 87\]](#) and [Setting Up File Systems for a High Availability System \[page 84\]](#)
2. If you want to share the transport directory `trans` from another system, you have to [mount \[page 105\]](#) it from this system. Otherwise we recommend that you share the `trans` directory that is created during the installation of the primary application server instance (see below).
3. You set up the **switchover cluster infrastructure** as follows:

i Note

The following procedure is an example. In this example, we use only one primary cluster node, **host A**, and one standby cluster node, **host B**.

If required, you can also install the ASCS instance and the SCS instance on **different** hosts.

In this case, you require:

- At least one primary cluster node, **host A1**, for the primary node with the ASCS instance, and at least one primary cluster node, **host A2**, for the primary node with the SCS instance.
- At least one standby node, **host B1**, for the primary node with the ASCS instance, and at least one standby node, **host B2**, for the primary node with the SCS instance.

1. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the ABAP central services instance (ASCS instance) on the primary cluster node, **host A**. Use a [virtual host name \[page 87\]](#).

i Note

If you want to [install an ASCS instance with integrated SAP Web Dispatcher \[page 24\]](#), you must choose the *Custom* parameter mode.

When processing the screens for the ASCS instance installation, you are prompted to mark a checkbox if you want to install an SAP Web Dispatcher instance with the ASCS instance. If you mark this checkbox, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the enqueue replication server instance (ERS instance) for the ASCS instance on the primary cluster node, **host A**. Use a [virtual host name \[page 87\]](#).

i Note

If you want to [install an ASCS instance with integrated SAP Web Dispatcher \[page 24\]](#), you must choose the *Custom* parameter mode.

When processing the screens for the ASCS instance installation, you are prompted to mark a checkbox if you want to install an SAP Web Dispatcher instance with the ASCS instance. If you mark this checkbox, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

3. You [export global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` to the database host and to the primary application server instance host.
4. You prepare the standby cluster node, **host B**, making sure that it meets the [hardware and software requirements \[page 32\]](#) and it has all the necessary [file systems \[page 84\]](#), mount points, and (if required) Network File System (NFS).
5. You set up the user environment on the standby node, **host B**:
 - You use the same user and group IDs as on the primary node.
 - You create the home directories of users and copy all files from the home directory of the primary node.For more information about the required operating system users and groups, see [Creating Operating System Users \[page 70\]](#).
6. You configure the switchover software and test that switchover functions correctly to **all** standby nodes in the cluster.
7. You repeat the following steps until you have finished installing the enqueue replication server (ERS instance) on **all** nodes in the cluster:
 1. You perform the switchover to a node where you want to install the enqueue replication server instance (ERS instance) for the ASCS instance.

2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the enqueue replication server instance (ERS instance) for the ASCS instance on the standby node, **host B**.
4. On the **database instance host**, you do the following:

➔ Recommendation

We recommend that the database instance is part of the hardware cluster or of any other proprietary high-availability solution for the database.

1. You make available the global directories in `<sapmnt>/<SAPSID>` from the switchover cluster infrastructure and – optionally – from the SAP transport host.
2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the database instance on the **database instance host**.

i Note

If your database release is Oracle 12c and you want to install it as a container database (CDB) or as a pluggable database PDB in an existing CDB (multitenant database installation), perform the additional steps as described in [Oracle Database 12c Multitenant Database Installation \[page 182\]](#).

3. If you want to install Oracle Real Application Clusters (RAC), proceed as described in [Installing Oracle Real Application Clusters \[page 178\]](#).
4. If you want to install the database instance on Oracle Automatic Storage Management (ASM), proceed as described in [Installing Database Instance on Oracle Automatic Storage Management \[page 181\]](#).
5. On the **primary application server instance host**, you do the following:

i Note

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 instance), which is protected by the cluster.

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 ABAP central services instance (ASCS instance), which is protected by the cluster.

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 instances (SCS instance and ASCS instance), which are protected by the cluster.

1. You [mount the global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` that you exported from the switchover cluster infrastructure.
2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the primary application server instance.

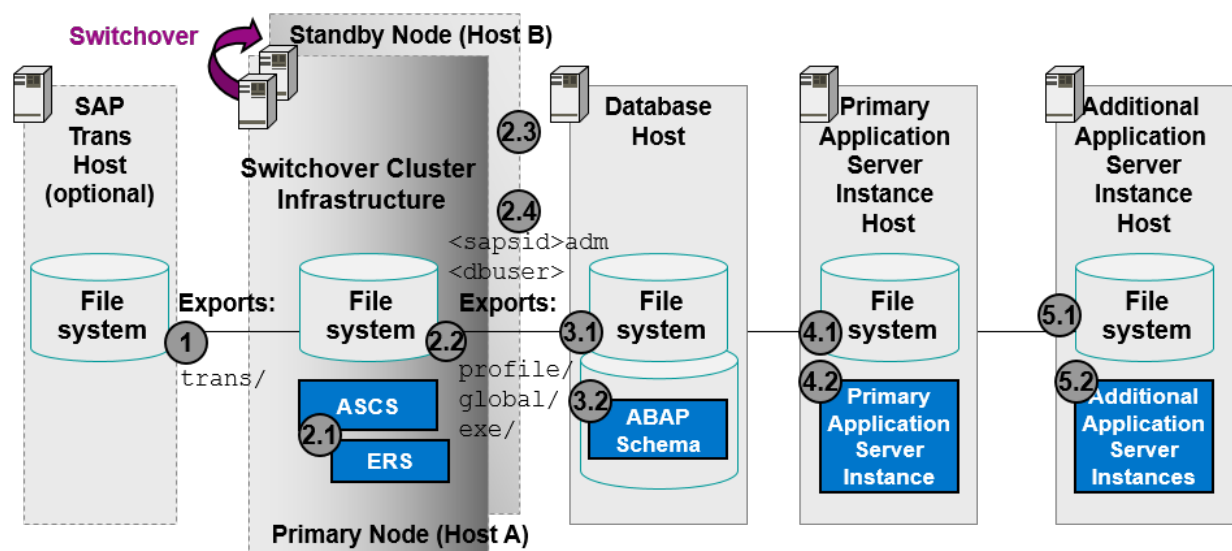
i Note

If your database release is Oracle 12c, during the installation you need to specify how the application server instance is to connect to a pluggable database or a "normal" database. For more information, see [Installing a Distributed Application Server Instance \[page 184\]](#).

3. If you have installed Oracle Real Application Clusters (RAC), perform the required additional steps for the primary application server instance as described in [Installing Oracle Real Application Clusters \[page 178\]](#).
4. If you want to use the shared transport directory `trans` from another system, you also [mount \[page 105\]](#) this directory (see above).
6. We recommend you to install additional application server (AS) instances to create redundancy. The AS instances are not a SPOF. Therefore, do **not** include these instances in the cluster.
7. You continue with [Post-Installation \[page 137\]](#).

Graphical Overview

The following figure provides an overview of how you install the various instances in a high-availability installation:



- | | | |
|---|---|--|
| <ol style="list-style-type: none"> 1 Export <code>trans</code> directory to switchover cluster, database, and primary application server instance host. 2.1 Install ASCS instance and (optionally) related ERS instance on primary node (host A) 2.2 Export global directories | <ol style="list-style-type: none"> 2.3 Prepare standby node (host B): Set up users and file systems 2.4 If required, install ERS instance on standby note (host B) 3.1 Prepare mount points, file systems 3.2 Install database instance | <ol style="list-style-type: none"> 4.1 Prepare mount points, file systems 4.2 Install the primary application server instance 5.1 Mount global directories 5.2 Install additional application server instances |
|---|---|--|

Figure 17: Distribution of Instances in a High-Availability ABAP System

Additional Application Server Instance

Installation Steps for Additional Application Server Instances for a Standard System

1. If you want to install additional application server instances on a host different from the SAP system host, you export global directories in `<sapmnt>/<SAPSID>` to the hosts on which you want to install additional application server instances.

2. On every **additional application server instance host**, you do the following:
 1. If you want to install additional application server instances on a host different from the SAP system host, you [mount the global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP system host.
 2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the additional application server instance.

i Note

If your database release is Oracle 12c, during the installation you need to specify how the application server instance is to connect to a pluggable database or a “normal” database. For more information, see [Installing a Distributed Application Server Instance \[page 184\]](#).

3. If you have installed Oracle Real Application Clusters (RAC), perform the required additional steps for the primary application server instance as described in [Installing Oracle Real Application Clusters \[page 178\]](#).
3. You continue with [Post-Installation \[page 137\]](#).

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 \[page 105\]](#) it from this system. Otherwise, we recommend that you share the `trans` directory that is created during the installation of the primary application server instance.
2. On the **SAP global host**, you export global directories in `<sapmnt>/<SAPSID>` to the hosts on which you want to install additional application server instances.
3. On every **additional application server instance host**, you do the following:
 1. You [mount the global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
 2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the additional application server instance.

i Note

If your database release is Oracle 12c, during the installation you need to specify how the application server instance is to connect to a pluggable database or a “normal” database. For more information, see [Installing a Distributed Application Server Instance \[page 184\]](#).

3. If you have installed Oracle Real Application Clusters (RAC), perform the required additional steps for the additional application server instance as described in [Installing Oracle Real Application Clusters \[page 178\]](#).
 4. If you want to use the shared transport directory `trans` from another system, also [mount \[page 105\]](#) this directory.
4. You continue with [Post-Installation \[page 137\]](#).

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 \[page 105\]](#) it from this system. Otherwise, we recommend that you share the `trans` directory that is created during the installation of the primary application server instance.
2. On the **primary node, host A**, of the **switchover cluster infrastructure**, you export global directories in `<sapmnt>/<SAPSID>` to the hosts on which you want to install additional application server instances.

3. On each **additional application server instance host**, do the following:
 1. You [mount the global directories \[page 106\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
 2. You [check the prerequisites \[page 108\]](#) and [run the installer \[page 110\]](#) to install the additional application server instance.

i Note

If your database release is Oracle 12c, during the installation you need to specify how the application server instance is to connect to a pluggable database or a "normal" database. For more information, see [Installing a Distributed Application Server Instance \[page 184\]](#).

3. If you have installed Oracle Real Application Clusters (RAC), perform the required additional steps for the additional application server instance as described in [Installing Oracle Real Application Clusters \[page 178\]](#).
4. If you want to use the shared transport directory `trans` from another system, you also [mount \[page 105\]](#) this directory.
4. You continue with [Post-Installation \[page 137\]](#).

5.2 Exporting and Mounting the Transport Directory

Every SAP system must be assigned to a transport directory. All application server instances of an SAP system must point to the same transport directory.

Multiple SAP system can use the same transport directory. However, it is not required to have one global transport directory in your SAP system landscape. Depending on your security requirements, you must decide how you want to set up the transport directories in your landscape. Systems with lower security requirements can share a transport directory (DEV, QA, for example). For systems with higher security requirements (PROD, for example), you might want to have a separate transport directory.

The transport directory is used by the Change and Transport System (CTS). The CTS helps you to organize development projects, and then transport the changes between the SAP systems in your system landscape.

For more information, see:

Table 31:

Release	SAP Library Path
<ul style="list-style-type: none"> • SAP NetWeaver 7.3 http://help.sap.com/nw73 • SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 • SAP NetWeaver 7.4 http://help.sap.com/nw74 • SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Application Server</i> ▶ <i>Application Server ABAP</i> ▶ <i>Administration of Application Server ABAP</i> ▶ <i>Change and Transport System</i> ▶ <i>Change and Transport System - Overview</i> ▶ <i>Basics of the Change and Transport System</i> ▶ <i>Transport Management System - Concept</i> ▶</p>

Consider the following:

- If the transport directory already exists, make sure that it is exported on the transport directory host and mount it on the SAP instance installation host.
- If the 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 transport directory host.
 - If you did not create the transport directory on your SAP instance installation host, mount it there.

Procedure

Exporting the Transport Directory

1. Log on as user `root` to the host where the 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

i 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`.
3. Mount `/usr/sap/trans` using Network File System (NFS) from the exporting host.

5.3 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, mount global directories from the SAP global host.

i Note

There is no need to create the directories before the installation when you install a primary application server instance. The global directories must be exported only if you install additional application server instances.

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 1.5 GB free space.

Procedure

1. Log on to the SAP global host as user `root` and export the following directories with read/write access for the `root` user to the host where you want to install the new instance:

```
<sapmnt>/<SAPSID>/exe  
<sapmnt>/<SAPSID>/profile  
<sapmnt>/<SAPSID>/global
```

Make sure that the user `root` of the host where you want to install the new instance can access the exported directories.

Caution

Make sure that the transport directory is mounted on every host where you want to install an SAP instance. Otherwise, the installation fails.

For more information, see [Exporting and Mounting the Transport Directory \[page 105\]](#).

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
```

Caution

Make sure that the mount points under `/<sapmnt>/<SAPSID>/` are permanent. Otherwise automatic start of the instance services does not work when you reboot the system.

5.4 Specifying the Initial Data Source of the User Management Engine

During the installation of your SAP system, you have to specify the initial data source of the User Management Engine (UME).

Prerequisites

You have planned how you want to configure user and access management for your SAP system to be installed as described in [Planning User and Access Management \[page 46\]](#).

Procedure

Using Central User Management

1. You install your SAP system as described in this installation guide.
2. Add the system to Central User Administration (CUA). For more information, see [Configuring User Management \[page 155\]](#).

Using an LDAP directory as Source for User Data

1. You install your SAP system as described in this installation guide.
2. Configure the user management of the newly installed SAP system to use an LDAP directory. For more information, see [Configuring User Management \[page 155\]](#).

5.5 Prerequisites for Running the Installer

Make sure you fulfil the following prerequisites before running the installer:

- We recommend that you use the `csh` shell for the installation. If you want to use another shell, make sure that you have read SAP Note [202227](#).
The installer uses `csh` scripts during the installation to obtain the environment for user `<sapsid>adm`. This is also true if user `<sapsid>adm` already exists from an earlier SAP system installation, and the shell of this user is not `csh`. Before you start the installer, execute the following command as user `<sapsid>adm` to make sure that the `csh` scripts are up-to-date:

```
/bin/csh -c "source /home/<sapsid>adm/.cshrc;env"
```
- 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 300 MB of free space in the installation directory for each installation option. In addition, you need 300 MB free space for the installer executables. If you cannot provide 300 MB free space in the temporary directory, you can set one of the environment variables `TEMP`, `TMP`, or `TMPDIR` to another directory with 300 MB free space for the installer executables.
You can set values for the `TEMP`, `TMP`, or `TMPDIR` environment variable to an alternative installation directory as described in section [Useful Information About the Installer \[page 117\]](#).
- 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 installer GUI.
You can set values for the `DISPLAY` environment variables as follows:

Table 32:

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

- Make sure that `umask` is set to `022` for the user with `root` permissions that you want to use for running the installer.
As the user with `root` permissions that you want to use for running the installer, enter the following command: `umask 022`
- Make sure that the limits for the user with `root` permissions that you want to use for running the installer are set correctly:

Table 33:

Operating System	Action
AIX	Proceed as described in SAP Note 323816 .
HP-UX	Check the output of command <code>limit</code> (if you use <code>csh</code> shell) or <code>ulimit -a</code> (if you use <code>sh</code> or <code>ksh</code> shell) according to section OS Dependencies > All Operating Systems of SAP Note 1704753 .
Linux	Check the output of command <code>limit</code> (if you use <code>csh</code> shell) or <code>ulimit -a</code> (if you use <code>sh</code> or <code>ksh</code> shell) according to section OS Dependencies > All Operating Systems of SAP Note 1704753 .
Solaris	Check the output of command <code>limit</code> (if you use <code>csh</code> shell) or <code>ulimit -a</code> (if you use <code>sh</code> or <code>ksh</code> shell) according to section OS Dependencies > All Operating Systems of SAP Note 1704753 .

- Make sure that you have defined the most important SAP system parameters as described in [Basic Installation Parameters \[page 47\]](#) **before** you start the installation.
- Check that your installation host meets the requirements for the installation options that you want to install. For more information, see [Running the Prerequisite Checker \[page 34\]](#).
- If you are installing a second or subsequent SAP system in an existing database (MCOD), make sure that the database is **up and running** before starting the installation.

Check that the SYSTEM tablespace contains at least 400 MB of free space. If there is not enough space left, increase the size of this tablespace with BRSPACE or BRTOOLS.

For more information, see [Installation of Multiple Components in One Database \[page 175\]](#).

- If you want to install an additional application server instance in an existing SAP system, make sure that:
 - There is exactly one entry in the `/usr/sap/sapservices` file for each SAP instance installed on this host. Be sure to check that the entry refers to the correct profile.
 - There are no profile backup files with an underscore “_” in their profile name. If so, replace the “_” with a “.”.

Example

```
Rename /usr/sap/S14/SYS/profile/S14_D20_zsi-aix693p2_D20081204  
to /usr/sap/S14/SYS/profile/S14_DVEBMGS20_zsi-aix693p2.D20081204.
```

- Make sure that the following ports are not used by other processes:
 - Port 21212 is used by default for communication between the installer GUI server and the installer GUI client.
If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:
`SAPINST_DIALOG_PORT=<Port_Number>`
 - Port 4239 is used by default for displaying the feedback evaluation form at the end of the installer processing.
The filled-out evaluation form is then sent to SAP using HTTPS.
If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:
`SAPINST_HTTP_PORT=<Port_Number>`

5.6 Running the Installer

This section describes how to run the installation tool Software Provisioning Manager 1.0 (the “installer” for short).

Software Provisioning Manager 1.0 includes a GUI client and a GUI server, which both use Java. In the following, GUI client and GUI server are called the “installer GUI”.

This procedure describes an installation where the installer and the installer GUI are running on the same host.

If you need to see the installation on a remote display, we recommend that you [perform a remote installation \[page 120\]](#), where the installer GUI is running on a **separate** host from the installer.

Alternatively you can use an X server for Microsoft Windows or other remote desktop tools for remote access to the installer GUI on Windows workstations. For more information, see SAP Note [1170809](#).

Prerequisites

For more information, see [Prerequisites for Running the Installer \[page 108\]](#).

Procedure

1. Log on to the installation host as a user with `root` permissions.

Caution

Make sure that the user with `root` permissions that you want to use for running the installer has not set any environment variables for a different SAP system or database.

2. Make the installation media available.
For more information, see [Preparing the Installation Media \[page 88\]](#).

Note

Even if you use the complete SAP kernel media, the installer might prompt you during the provisioning process for additional archives (*.SAR files) due to special Patch Level (PL) requirements depending on categories such as the product, operating system, and database platform.

For example: The installer might require a certain PL of `<X>` of the `SAPXEDB.SAR` (for DBTYPE `<Y>`), but this PL of the `SAPXEDB.SAR` is not contained in the SAP kernel media. In this case you have to download the required PL from <http://support.sap.com/swdc> following the instructions given in section *Downloading Specific Installation Archives (Archive-Based Installation)* in [Preparing the Installation Media \[page 88\]](#).

Recommendation

Make the installation media available **locally**. For example, if you use Network File System (NFS), reading from media mounted with NFS might fail.

Only valid for 'Platform': Oracle Solaris

Note

If you mount installation media, make sure that you do this with option `nomaplace`.

End of 'Platform': Oracle Solaris

3. Start the installer from the directory to which you unpacked the Software Provisioning Manager archive by executing the following command: `<Path_To_Unpack_Directory>/sapinst`

Note

If you are running a system copy with parallel export/import using the Migration Monitor and started the export with command line option `SUPPORT_DECLUSTERING=false`, you have to start the installer for the installation of the target database instance with command line option `SUPPORT_DECLUSTERING=true` for the import during the target system installation.

i Note

If you need to assign a virtual host name to the instance to be installed and you do not want to assign it by entering it as a parameter using the installer screens (see [SAP System Parameters \[page 48\]](#)), you can alternatively assign it by starting the installer with the `SAPINST_USE_HOSTNAME` property:

```
<Path_To_Unpack_Directory>/sapinst SAPINST_USE_HOSTNAME=<Virtual_Host_Name>
```

For more information, see [Using Virtual Host Names \[page 87\]](#).

i Note

If you are using a stack configuration file (see [Installation Using a Stack Configuration File \(Optional\) \[page 30\]](#)), you have to call the `sapinst` executable with the parameter

```
SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>:
```

```
/<Path_To_Unpack_Directory>/sapinst  
SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>
```

⚠ Caution

Make sure that the installation directory is not mounted with NFS, otherwise there might be problems when the Java Virtual Machine is started.

4. On the [Welcome](#) screen, choose the required option:

- Perform preparations
Go to one of the following:
 - Go to [Generic Options](#) and choose the required task:

Table 34:

Generic Options	Remarks
Verify Signed Media	<p>The digital signature ensures that the signatory of a digital document can be identified unambiguously and the name of the signatory is documented together with the signed document, the date, and the time. It is recommended to check the software integrity by performing a digital signature check for downloaded media and packages before using it with Software Provisioning Manager.</p> <p>For more information, see SAP Note 1979965.</p>

- Go to **Generic Options** > **<Database>** > **Preparations** and choose the required task:

Table 35:

Preparations	Remarks
<i>LDAP Registration</i>	Sets up LDAP support for an application server instance For more information about LDAP and Active Directory, see Integration of LDAP Directory Services [page 170] .
<i>SAP Host Agent</i>	Installs a standalone SAP Host Agent. For more information, see Standalone SAP Host Agent [page 26] .
<i>Operating System Users and Groups</i>	Allows you to use global accounts that are configured on a separate host Run this installation option before you start the installation of the SAP system.

- Go to **<Product>** > **<Database>** > **Preparations** and choose the required task:

Table 36:

Preparations	Remarks
<i>Prerequisites Check</i>	Checks your hardware and software requirements before you start the installation. For more information, see Running the Prerequisites Checker in Standalone Mode [page 34] .

- Install an SAP system:
 - To install an SAP system based on SAP NetWeaver Application Server for ABAP, choose **<Product>** > **<Database>** > **SAP Systems** > **Application Server ABAP** > **<System_Variant>**.
 - To install the application server ABAP for an SAP Process Integration system based on SAP NetWeaver 7.5, choose **SAP NetWeaver 7.5** > **<Database>** > **SAP Systems** > **Application Server ABAP for SAP Process Integration** > **<System_Variant>**.
 - To install the application server ABAP for an SAP Solution Manager 7.2 system, choose **SAP Solution Manager 7.2 <Support_Release>** > **SAP Solution Manager 7.2 ABAP <Support_Release>** > **<Database>** > **SAP System** > **Application Server ABAP** > **<System_Variant>**.

You can install the following system variants (**<System_Variant>**):

Table 37:

System Variants	Remarks
<i>Standard System</i>	Installs an SAP system with all mandatory instances on one host
<i>Distributed System</i>	Installs an SAP system with all mandatory instances on different hosts Perform the installation options exactly in the order they appear. You have to restart the installer on the relevant host for each installation option.

System Variants	Remarks
<i>High-Availability System</i>	<p>Installs a high-availability SAP system with all mandatory instances on different hosts</p> <p>Perform the installation options exactly in the order they appear. You have to re-start the installer on the relevant host for each installation option.</p>

- Perform other tasks or install additional components
Go to one of the following:
 - Go to <Product> <Database> and choose the required task:

Table 38:

Other Options	Remarks
<i>Additional SAP System Instances</i>	<ul style="list-style-type: none"> ○ <i>Additional Application Server Instance:</i> Installs one or more additional application server instances ○ <i>Split Off ASCS Instance from Existing Primary Application Server Instance:</i> Splits off an ABAP central services instance (ASCS) from the primary application server instance of an existing ABAP system or ABAP+Java (dual-stack) system. For more information, see Splitting Off an ABAP Central Services Instance from an Existing Primary Application Server Instance [page 189].
<i>System Copy</i>	<ul style="list-style-type: none"> ○ For the <i>Source System Export</i>, you use the system copy guides [page 204]. ○ For the <i>Target System Installation</i>, you follow the instructions in section <i>Target System Installation</i> in the system copy guides [page 204]. This section refers to the installation guide – this guide – for information that is valid for both installation from scratch and target system installation. ○ <i>Kernel Media Creation</i> Optional step to create a kernel media out of an existing SAP system using *.lst files of the SAP system executable directories.

- Go to *Generic Options* and choose the required task:

Table 39:

Other Options	Remarks
<Database> <i>Uninstall</i>	<p>Choose this option to uninstall your SAP system, standalone engines, or optional standalone units.</p> <p>For more information, see Deleting an SAP System or Single Instances [page 199].</p>

5. Choose *Next*.
6. Follow the instructions on the installer screens and enter the required parameters.

i 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**.

i Note

If you want to [install an ASCS instance with integrated SAP Web Dispatcher \[page 24\]](#), you must choose the *Custom* parameter mode.

When processing the screens for the ASCS instance installation, you are prompted to mark a checkbox if you want to install an SAP Web Dispatcher instance with the ASCS instance. If you mark this checkbox, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

i Note

If you are performing the target system installation in the context of a system copy with parallel export/import using the Migration Monitor and the target database is declustered - that is you started the installer for the target database instance installation with command line option **SUPPORT_DECLUSTERING=true** as described above - add the following load options parameter in the *SAP System Advanced Load Configuration* screen:

```
-datacodepage <datacodepage_of_source_system>
```

The advanced screen for load configuration only appears if you run the installer in *Custom* parameter mode. You can check the parameter within the `import_monitor_cmd.properties` file located in the installation directory, in the `loadArgs` entry.

For more information, see the system copy guides at <http://help.sap.com/slttoolset> ►► *System Provisioning* ► *System Copy Option* ► *Guide for Systems Based on SAP NetWeaver 7.1 & Higher* ►

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

7. To start the installation, choose *Start*.

The installer starts the installation and displays the progress of the installation. When the installation has finished, the installer shows the message: Execution of `<Option_Name>` has completed.

i Note

- During the installation of the Oracle database instance, the installer stops the installation and prompts you to [install the Oracle database software \[page 126\]](#).

This action is not required if you install a system into an existing database (MCOB).

After you have finished the installation of the Oracle database, you continue the database instance installation by choosing *OK* in the GUI of the database instance installation.

- Check SAP Note [1431800](#) for technical information about Oracle Release 11 in SAP environments.
- Check SAP Note [1914631](#) for technical information about Oracle Release 12 in SAP environments.
- If you want to install Oracle Real Application Clusters (RAC), proceed as described in [Installing Oracle Real Application Clusters \[page 178\]](#) after the Software Provisioning Manager has completed the installation of the database instance.

- If you want to install the database instance on Oracle Automatic Storage Management (ASM), proceed as described in [Installing Database Instance on Oracle Automatic Storage Management \[page 181\]](#) after the Software Provisioning Manager has completed the installation of the database instance.

Only valid for 'Platform': HP-UX

Caution

If you decided to use 02 as the instance number, the instance fails to start during the installation process. For more information about the cause, see the item *Instance Number* in [SAP System Parameters \[page 48\]](#). You have to manually change the port number for report RSLGCOLL to continue with the installation.

Proceed as follows:

1. Go to directory `<sapmnt>/<SAPSID>/profile`
2. Edit `DEFAULT.PFL`.
3. Set the parameter `rslg/collect_daemon/listen_port` to a free port number.

End of 'Platform': HP-UX

8. If required, delete directories with the name `sapinst_exe.xxxxxx.xxxx` after the installer has finished. Sometimes these remain in the temporary directory.

Note

If there are errors with the extraction process of the installer, you can find the log file `dev_selfex.out` in the temporary directory.

Recommendation

Keep all installation directories until you are sure that the system, including all instances, is completely and correctly installed. Once the system is completely and correctly installed, make a copy of the installation directories with all their contents and save it to a physically separate medium, such as an optical media or a USB drive separate from your installation hosts. This might be useful for analyzing issues occurring later when you use the system. For security reasons, do **not** keep installation directories on installation hosts, but make sure that you delete them after saving them separately.

9. We recommend that you delete all files in the directory `<User_Home>/ .sdtgui`.
10. If you copied the installer software to your hard disk, you can delete these files when the installation has successfully completed.

5.7 Additional Information About the Installer

The following sections provide additional information about the installer:

- [Useful Information About the Installer \[page 117\]](#)
- [Interrupted Installation \[page 118\]](#)
- [Performing a Remote Installation \[page 120\]](#)
- [Starting the Installer GUI Separately \[page 122\]](#)

- [Running the Installer in Accessibility Mode \[page 124\]](#)
- [Entries in the Services File Created by the Installer \[page 125\]](#)
- [Troubleshooting with the Installer \[page 126\]](#)

5.7.1 Useful Information About the Installer

This section contains some useful technical background information about the installer and the installer GUI.

- The installer creates the installation directory `sapinst_instdir` directly below the temporary directory. The installer finds the temporary directory by checking the value of the `TEMP`, `TMP`, or `TMPDIR` environment variable. If no value is set for these variables, the installer uses `/tmp` as **default** installation directory. If you want to use an **alternative** installation directory, set the environment variable `TEMP`, `TMP`, or `TMPDIR` to the required directory before you start the installer.

Table 40:

Shell Used	Command
Bourne shell (sh)	<code>TEMP=<Directory></code> <code>export TEMP</code>
C shell (csh)	<code>setenv TEMP <Directory></code>
Korn shell (ksh)	<code>export TEMP=<Directory></code>




Caution

Make sure that the installation directory is not mounted with NFS, otherwise there might be problems when the Java Virtual Machine is started.

- For each option, the installer creates a subdirectory located in the `sapinst_instdir` directory.
- The installer extracts itself to the temporary directory. These executables are deleted again after the installer has stopped running. Directories called `sapinst_exe.xxxxxxx.xxxx` sometimes remain in the temporary directory. You can safely delete them. The temporary directory also contains the log file `dev_selfex.out` from the extraction process, which might be useful if an error occurs.

Caution

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

- To see a list of all available installer properties, start the installer as described above with the option `-p`:
`./sapinst -p`
- If you need to run the installer in accessibility mode, proceed as described in [Running the Installer in Accessibility Mode \[page 124\]](#).
- If required, stop the installer by choosing  `SAPInst`  `Exit Process`  in the installer GUI menu.

Note

If you need to terminate the installer, press `Ctrl` + `C`.

- If you want to install an SAP system in unattended mode, see SAP Note [2230669](#) which describes an improved procedure using `inifile.params`.

5.7.2 Interrupted Processing of the Installer

The processing of the installer might be interrupted for one of the following reasons:

- An error occurred during the *Define Parameters* or *Execute* phase:
The installer 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 of 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 Process* in the *SAPinst* menu.

Caution

If you stop an option in the *Execute* phase, any system or component **installed** by this option is incomplete and not ready to be used. Any system or component **uninstalled** by this option is not completely uninstalled.

The following table describes the options in the dialog box:

Table 41:

Option	Definition
<i>Retry</i>	<p>The installer retries the installation from the point of failure without repeating any of the previous steps.</p> <p>This is possible because the installer records the installation progress in the <code>keydb.xml</code> file.</p> <p>We recommend that you view the entries in the log files, try to solve the problem, and then choose <i>Retry</i>.</p> <p>If the same or a different error occurs, the installer displays the same dialog box again.</p>
<i>Stop</i>	<p>The installer stops the installation, closing the dialog box, the installer GUI, and the GUI server.</p> <p>The installer 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.</p>
<i>Continue</i>	<p>The installer continues the installation from the current point.</p>
<i>View Log</i>	<p>Access installation log files.</p>

i Note

You can also terminate the installer by choosing `Ctrl` + `C` but we do **not** recommend this because it 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 the installation host as a user with the required permissions as described in [Running the Installer \[page 110\]](#).
2. Make sure that the installation media are still available on the installation host.
For more information, see [Preparing the Installation Media \[page 88\]](#).

➔ Recommendation

Make the installation media available **locally**. For example, if you use remote file shares on other Windows hosts, CIFS shares on third-party SMB-servers, or Network File System (NFS), reading from media mounted with NFS might fail.

Only valid for 'Platform': Oracle Solaris




i Note

If you mount installation media, make sure that you do this with option **nomapcase**.

End of 'Platform': Oracle Solaris

3. Restart the installer from the directory to which you unpacked the Software Provisioning Manager archive by executing the following command:
<Path_To_Unpack_Directory>/sapinst
4. From the tree structure on the *Welcome* screen, select the installation option that you want to continue and choose *Next*.
The *What do you want to do?* screen appears.
5. On the *What do you want to do?* screen, decide between the following alternatives and continue with *Next*:

Table 42:

Alternative	Behavior
<i>Run a new option</i>	<p>The installer does not continue the interrupted installation option. Instead, it moves the content of the old installation directory and all installation-specific files to a backup directory. Afterwards, you can no longer continue the old installation option.</p> <p>The following naming convention is used for the backup directory:</p> <pre>log_<Day>_<Month>_<Year>_<Hours>_<Minutes>_<Seconds></pre> <div style="background-color: #fff9c4; padding: 5px;"> <p> Example</p> <pre>log_01_Oct_2008_13_47_56</pre> </div> <div style="background-color: #fff9c4; padding: 5px;"> <p> Note</p> <p>All actions taken by the installation before you stopped it (such as creating directories or users) are not revoked.</p> </div> <div style="background-color: #fff9c4; padding: 5px;"> <p> Caution</p> <p>The installer moves all the files and folders to a new log directory, even if these files and folders are owned by other users. If there are any processes currently running on these files and folders, they might no longer function properly.</p> </div>
<i>Continue with the old option</i>	The installer continues the interrupted installation from the point of failure.

5.7.3 Performing a Remote Installation

You use this procedure to install your SAP system on a **remote host**. In this case, the installer runs on the **remote host**, and the installer GUI runs on the **local host**. The local host is the host from which you control the installation with the installer GUI. The installer GUI connects using a secure SSL connection to the installer.

If your security policy requires that the person performing the installation by running the installer GUI on the local host is not allowed to know the credentials of a user with `root` permissions on the remote host, you can specify another operating system user for authentication purposes. You do this using the `SAPINST_REMOTE_ACCESS_USER` parameter when starting the `sapinst` executable from the command line. You have to confirm that the user is a trusted one. For more information, see SAP Note [1745524](#).

Alternatively you can use an X server for Microsoft Windows or other remote desktop tools for remote access to the installer GUI on Windows workstations. For more information, see SAP Note [1170809](#).

Prerequisites

- The remote host meets the prerequisites for starting the installer as described in [Prerequisites for Running the Installer \[page 108\]](#).

- Both computers are in the same network and can ping each other.
To test this:
 1. Log on to your remote host and enter the command: `ping <Local_Host>`
 2. Log on to the local host and enter the command: `ping <Remote_Host>`
- Make sure that the `sapinst` executable on the remote host and the `sapinstgui` executable on the local host have exactly the same version. You can check this by using the option `-sfxver` as described in the procedure below and in the procedure in [Starting the Installer GUI Separately \[page 122\]](#).
- If you need to specify another operating system user with the `SAPINST_REMOTE_ACCESS_USER` command line parameter, make sure that this user exists on the remote host.

Procedure

1. Log on as a user with `root` permissions.

Caution

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

2. Make the installation media available on the remote host.
For more information, see [Preparing the Installation Media \[page 88\]](#).

Recommendation

Make the installation media available **locally**. For example, if you use Network File System (NFS), reading from media mounted with NFS might fail.

Only valid for 'Platform': Oracle Solaris

Note

If you mount installation media, make sure that you do this with option `nomaplace`.

End of 'Platform': Oracle Solaris

3. Check the version of the `sapinst` executable by entering the following command:
`<Path_To_Unpack_Directory>/sapinst -sfxver`
The version of the `sapinst` executable must be exactly the same as the version of the `sapinstgui` executable on the local host (see also [Starting the Installer GUI Separately \[page 122\]](#)).
4. Start the installer from the directory to which you unpacked the Software Provisioning Manager 1.0 archive by executing the following command:
`<Path_To_Unpack_Directory>/sapinst -nogui`

Note

If you need to specify another operating system user for authentication purposes, enter the following command:

```
<Path_To_Unpack_Directory>/sapinst -nogui
SAPINST_REMOTE_ACCESS_USER=<Specified_OS_User>
```

i Note

If you need to assign a virtual host name to the instance to be installed and you do not want to assign it by entering it as a parameter using the installer screens (see [SAP System Parameters \[page 48\]](#)), you can alternatively assign it by starting the installer with the `SAPINST_USE_HOSTNAME` property:

```
<Path_To_Unpack_Directory>/sapinst -nogui  
SAPINST_USE_HOSTNAME=<Virtual_Host_Name>
```

For more information, see [Using Virtual Host Names \[page 87\]](#).

i Note

If you are using a stack configuration file (see [Installation Using a Stack Configuration File \(Optional\) \[page 30\]](#)), you have to call the `sapinst` executable with the parameter

```
SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>:
```

```
/<Path_To_Unpack_Directory>/sapinst -nogui  
SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>
```

The installer now starts and waits for the connection to the installer 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
```

5. Start the installer GUI on your **local** host as described in [Starting the Installer GUI Separately \[page 122\]](#).

5.7.4 Starting the Installer GUI Separately

You use this procedure to start the installer GUI separately.

You might need to start the installer GUI separately in the following cases:

- You closed the installer GUI using **File > Close GUI only** from the installer menu while the installer is still running.
- You want to perform a remote installation, where the installer GUI runs on a different host from the installer. For more information, see [Performing a Remote Installation \[page 120\]](#).
- You want to run the installer in accessibility mode. In this case, you have to start the installer GUI separately on a Windows host as described below with the command line parameter **-accessible**. For more information, see [Running the Installer in Accessibility Mode \[page 124\]](#).

Prerequisites

- The host on which you want to start the installer GUI meets the prerequisites for starting the installer as described in [Prerequisites for Running the Installer \[page 108\]](#).

i Note

If you want to run the installer on a Windows host, make sure that you meet the prerequisites for the installer listed in the relevant Windows guide.

- Make sure that the `sapinst` executable on the remote host and the `sapinstgui` executable on the local host have exactly the same version. You can check this by using the option `-sfxver` as described in the procedure below and in the procedure in [Performing a Remote Installation \[page 120\]](#).

Procedure

In this procedure, the following variables are used: `<Remote_Host>` is the name of the remote host, and `<Port_Number_Gui_Server_To_Gui_Client>` is the port the GUI server uses to communicate with the GUI client (21212 by default).

i Note

If you want to run the installer GUI on a remote host, it is mandatory to start the installer using the `-nogui` property. If you have already started the installer without the `-nogui` property and want to run the GUI on a different host, you have to exit the installation process by choosing **▶ SAPinst ▶ Exit Process ▶** and then follow the steps described in [Interrupted Installation \[page 118\]](#). Use the `-nogui` property to restart the installer and start the installer GUI on the intended host.

Starting the Installer GUI on Windows

1. Make the installer software available on the host on which you want to start the installer GUI.
For more information, see [Preparing the Installation Media \[page 88\]](#).
2. Start the installer GUI by executing the `sapinstgui` executable with the appropriate command line parameters:
 - If you want to perform a remote installation, proceed as follows:
 1. Check the version of `sapinstgui.exe` by entering the following command:
`<Path_To_Unpack_Directory>\sapinstgui.exe -sfxver`
The version of the `sapinstgui` executable must be exactly the same as the version of the `sapinst` executable on the remote host (see also [Performing a Remote Installation \[page 120\]](#)).
 2. Start the installer GUI by entering the following command:
`<Path_To_Unpack_Directory>\sapinstgui.exe -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`
 - If you closed the installer GUI using **▶ File ▶ Close GUI only ▶** and want to reconnect to the installer, proceed as follows:
 1. If you are performing a local installation with the installer and the installer GUI running on the **same** host, execute the following command:
`<Path_To_Unpack_Directory>\sapinstgui.exe -port <Port_Number_Gui_Server_To_Gui_Client>`
 2. If you are performing a remote installation with the installer and the installer GUI running on **different** hosts, execute the following command:
`<Path_To_Unpack_Directory>\sapinstgui.exe -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`

3. The installer GUI starts and connects to the installer.

Starting the Installer GUI on UNIX

1. Make the installer software available on the host on which you want to start the installer GUI.
For more information, see [Preparing the Installation Media \[page 88\]](#).
2. Start the installer GUI by executing the `sapinstgui` executable with the appropriate command line parameters:
 - If you want to perform a remote installation, proceed as follows:
 1. Check the version of the `sapinstgui` executable by entering the following command:
`<Path_To_Unpack_Directory>/sapinstgui -sfxver`
The version of the `sapinstgui` executable must be exactly the same as the version of the `sapinst` executable on the remote host (see also [Performing a Remote Installation \[page 120\]](#)).
 2. Start the installer GUI by entering the following command:
`<Path_To_Unpack_Directory>/sapinstgui -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`
 - If you closed the installer GUI using **File > Close GUI only** and want to reconnect to the installer, proceed as follows:
 1. If you are performing a local installation with the installer and the installer GUI running on the same host, execute the following command:
`<Path_To_Unpack_Directory>/sapinstgui -port <Port_Number_Gui_Server_To_Gui_Client>`
 2. If you are performing a remote installation with the installer and the installer GUI running on different hosts, execute the following command:
`<Path_To_Unpack_Directory>/sapinstgui -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`
3. The installer GUI starts and connects to the installer.

5.7.5 Running the Installer in Accessibility Mode

You can also run the installer in accessibility mode. The following features are available:

- Keyboard access:
This feature is available for all operating systems.
- High-contrast color:
This feature is derived from the Windows display properties. Therefore, to enable this feature, perform a remote installation with the installer GUI running on a Windows host.
- Custom font setting:
This feature is derived from the Windows display properties. Therefore, to enable this feature, perform a remote installation with the installer GUI running on a Windows host.

Procedure

Activating and Adjusting Accessibility Settings on Windows

You first have to activate and adjust the relevant settings for the font size and color schemes **before** you start the installer or the installer GUI.

i Note

The following procedure applies for Windows Server 2008 and might be different when using another Windows operating system.

1. Right click on your Windows desktop and choose *Personalize*.
2. Choose *Adjust font size (DPI)* and choose *Larger scale (120 DPI)*.
To define other font size schemes, choose *Custom DPI*.
3. In the right-hand pane, select *Window Color and Appearance*.
Select a color scheme from the *Color scheme* dropdown box.
To define your own color schemes, choose *Advanced*.

Running the Installer in Accessibility Mode

You perform a remote installation as follows:

1. Start the installer on the remote host by executing the following command from the command line as described in [Performing a Remote Installation \[page 120\]](#):
`./sapinst -nogui`
2. Start the installer GUI on a local Windows host by executing the following command from the command line as described in [Starting the Installer GUI Separately \[page 122\]](#):
`sapinstgui.exe -accessible -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`

5.7.6 Entries in the Services File Created by the Installer

After the installation has finished successfully, the installer has created the following entries in `/etc/services`:

```
sapdp<Instance_Number> = 32<Instance_Number>/tcp
sapdp<Instance_Number>s = 47<Instance_Number>/tcp
sapgw<Instance_Number> = 33<Instance_Number>/tcp
sapgw<Instance_Number>s = 48<Instance_Number>/tcp
sapms<SAPSID> = 36<Instance_Number>/tcp (unless you specified another value during the installation)
```

i Note

- There is a port created for every possible instance number, regardless of which instance number you specified during the installation. For example, for `sapgw<Instance_Number> = 33<Instance_Number>/tcp` the following range of entries is created:
`sapgw00 = 3300/tcp`
`sapgw01 = 3301/tcp`
`sapgw02 = 3302/tcp`
[...]
`sapgw98 = 3398/tcp`
`sapgw99 = 3399/tcp`

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

5.7.7 Troubleshooting with the Installer

This section tells you how to proceed when errors occur while the installer is running.

If an error occurs, the installer:

- Stops the installer
- Displays a dialog informing you about the error

Procedure

1. Check SAP Note [1548438](#) for known installer issues.
2. To view the log file, choose [View Logs](#).
3. If an error occurs during the dialog or processing phase, do one of the following:
 - Try to solve the problem.
 - Abort the installer by choosing [Stop](#) from the error message or **▶ SAPinst ▶ Exit Process ▢** in the tool menu.
For more information, see [Interrupted Installation \[page 118\]](#).

Continue by choosing [Retry](#).

4. Check the log and trace files of the GUI server and the installer GUI in the directory `<User_Home>/ .sdtgui/` for errors.
 - If the GUI server or the installer GUI do not start, check the file `sdtstart.err` in the current `<User_Home>` directory.
 - If the installer GUI aborts without an error message, restart the installer GUI as described in [Starting the Installer GUI Separately \[page 122\]](#).
 - If you use an X Server for Microsoft Windows or other remote desktop tools for the Remote Access of the installer GUI on Windows Workstations and you experience display problems such as missing repaints or refreshes, contact your X Server vendor. The vendor can give you information about whether this X Server supports Java Swing-based GUIs and also tell you about further requirements and restrictions. For more information, see SAP Note [1170809](#).
5. If you cannot resolve the problem, report an incident using component BC-INS.
For more information about using subcomponents of BC-INS, see SAP Note [1669327](#).

5.8 Oracle Database Software Installation

Continue with the section relevant for the release of the Oracle database that you want to install:

- [Oracle 11 Database Software Installation \[page 127\]](#)

- [Oracle 12 Database Software Installation \[page 131\]](#)

5.8.1 Oracle 11 Database Software Installation

The installer prompts you to install the Oracle database software.

Proceed as follows to install the Oracle 11 database software:

Process Flow

1. You [update the Oracle installation scripts \[page 127\]](#).
2.

Only valid for 'Platform': AIX You perform steps for the AIX operating system [page 128] End of 'Platform': AIX

3. You [run the Oracle Universal Installer \[page 128\]](#).
4. You [install the required SAP bundle patch \[page 131\]](#).

5.8.1.1 Updating the SAP RUNINSTALLER Scripts

Use

If a newer version is available, we recommend that you update the Oracle Installation scripts, which are attached to SAP Note [1524205](#). From there you can download the relevant package for your release. After you have extracted the Oracle software to the staging area, you need to update the installation scripts.

Prerequisites

The SAP-specific installation scripts `RUNINSTALLER`, `RUNINSTALLER_CHECK`, and `11ginstall.sh` are located in directory `SAP` in the Oracle database software stage.

Procedure

Updating the Installation Scripts

1. Check SAP Note [1524205](#) to see if there is a more recent version of the installation scripts than on the installation medium.
2. If required, download the new version attached to the SAP Note, following the instructions there.

5.8.1.2 Performing Pre-Installation Steps for the AIX Operating System

This topic is only valid for 'Platform': AIX

Use

To install the Oracle database software on the AIX operating system, you need to run the `rootpre.sh` script to adapt the AIX kernel and also execute a command as the `root` user.

Prerequisites

- If several Oracle instances run on one computer, you must shut these down **before** adapting the kernel.
- Make sure that the `ORACLE_HOME` and `ORACLE_SID` environment variables are set.

Procedure

Run the `rootpre.sh` script as follows:

1. Log on to the system with user `ora<dbSID>` if you are not already logged on.
2. Change to the directory `/oracle/stage/112_64/database` using the following command:
`cd /oracle/stage/112_64/database`
3. Make sure that the user `root` is assigned the environment of `ora<dbSID>`:
`su root`
4. Call the script `rootpre.sh`:
`./rootpre.sh`
5. Log off with the user `root`:
`exit`

End of 'Platform': AIX

5.8.1.3 Installing the Oracle Database Software

Use

Starting with the first patch set for Oracle Database 11g Release 2 (11.2.0.2), Oracle Database patch sets are full installations of the Oracle database software. You only need to install the current Oracle database patch set. For more information about the current patch set, see SAP Note [1431799](#).

For more information about how to install Oracle database 11.2 software, see SAP Note [1524205](#).
Troubleshooting the installation is described in SAP Note [1431796](#).

Caution

Before starting to install the Oracle software, make sure that you have updated the installation scripts as described in [Updating the Oracle Installation Scripts \[page 132\]](#).

Prerequisites

A graphical user interface (GUI), for example x11, is required for the Oracle database software installation with `runInstaller`. For more information, see the documentation of your operating system.

Procedure

1. Log on as the Oracle database software owner `<ora_sw_owner>`.
If you are already logged on as user `root`, you can switch to the Oracle database software owner, user `<ora_sw_owner>`, by entering the following command:
`su - <ora_sw_owner>`
2. Change to the `stage` directory:
`cd /oracle/stage/112_64/database/SAP`
3. Make sure that `umask` is set to `022` by entering the following command:
`umask 022`
4. Make sure that the `DISPLAY` environment variable is set to `<Host_Name>:0.0`, where `<Host_Name>` is the host on which you want to display the GUI of the Oracle Universal Installer (OUI).

Table 43:

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

5. Start the OUI with the Oracle database software owner, user `<ora_sw_owner>`, as follows:

`./RUNINSTALLER`

For silent operation, enter this command:

`./RUNINSTALLER -silent`

For more information on further options, see SAP Note [1524205](#).

6. Respond to the OUI as follows:

Table 44:

Prompt or Condition	Action
<i>Configure Security Updates</i>	Do not select the checkbox. The runInstaller issues a warning. Choose <i>OK</i> and then <i>Next</i> .
<i>Select Installation Option</i>	Confirm the default selections by choosing <i>Next</i> .
<i>Grid Installation Options</i>	Confirm the default selection <i>Single Instance Installation</i> and then choose <i>Next</i> .
<i>Select Product Language</i>	Confirm the default option <i>English</i> and then choose <i>Next</i> .
<i>Select Database Edition</i>	Confirm the default option <i>Enterprise Edition</i> and then choose <i>Next</i> .
<i>Specify Installation Location</i>	This screen displays the value for ORACLE_BASE which is set in the environment. It also displays the value for ORACLE_HOME, which should be /oracle/DBSID/<release>. See SAP Note 1521371 to set ORACLE_BASE for your configuration. Select this option and then <i>Next</i> .
<i>Privileged OS Groups</i>	This screen displays the operating system groups for the DBA and the operator. Normally, these are dba and oper.
<i>Perform Prerequisite Checks</i>	This screen checks if all the required system prerequisites for installation of the database software have been met. If some of the checks are displayed as <i>Failed</i> , you can fix these problems (either by installing the missing patches or configuring the kernel parameters) and run the check again by choosing <i>Check Again</i> . ➔ Recommendation We strongly recommend you to make sure that there are no failed checks before starting the software installation.
<i>Summary</i>	Review the information displayed on this screen and choose <i>Finish</i> .
<i>Finish</i>	Finish the software installation by executing the root.sh script as the root user from another session.

7. To exit the OUI, choose *Exit* and confirm the dialog box that appears.

Result

The patch set software is now installed in the installation Oracle home. This is referred to – for example, in SAP Notes – as `<IHRDBMS>`.

Example

```
/oracle<DBSID>/11204
```


You now have to [install the required SAP bundle patch \[page 135\]](#).

5.8.1.4 Installing the Required SAP Bundle Patch


Use

After the Oracle database software installation, you need to install the required SAP bundle patch.


Note

You must install the SAP bundle patch using the Oracle tool MOPatch, which you can find at SAP Note [1027012](#) .

You only need to install the **latest** SAP bundle patch because these patches are cumulative.

The SAP bundle patch also delivers a set of upgrade scripts that automate most of the pre-upgrade and post-upgrade tasks. For more information, see SAP Note [1431793](#) .

Prerequisites

Check SAP Note [1431800](#)  to find a cross-reference to the current SAP Note with the list of required patches to be installed.

Procedure

1. Log on at the operating system level as the Oracle database software owner, user `<ora_sw_owner>`.
2. Install the SAP bundle patch according to the instructions in the SAP bundle patch README file.

5.8.2 Oracle 12 Database Software Installation

The installer prompts you to install the Oracle database software.

Proceed as follows to install the Oracle 12 database software:

Process Flow

1. You [update the SAP RUNINSTALLER scripts \[page 132\]](#).
2. You [install the current Oracle Database Patch Set \[page 132\]](#).
3. You [install the SAP Bundle Patch \[page 135\]](#).

5.8.2.1 Updating the SAP RUNINSTALLER Scripts

Use

The SAP-specific installation scripts `RUNINSTALLER` and `12cinstall.sh` are located in directory `SAP` in the Oracle database software stage (that is, `/oracle/stage/12102/database/SAP`).

You need to check the patch level of the `RUNINSTALLER` and check in SAP Note [1915301](#) whether a higher version is available. If a higher version is available, we recommend that you update the Oracle installation scripts, which are attached to SAP Note [1915301](#). From there you can download the relevant package for your release. After you have extracted the Oracle software to the staging area, you need to update the installation scripts.

Procedure

Updating the Installation Scripts

1. Check the current version of `RUNINSTALLER` as the database software owner, that is the `oracle` user:

```
cd /oracle/stage/121/database/SAP
./RUNINSTALLER -version
```
2. If a higher patch level is available, download the newer version in SAP Note [1915301](#), following the instructions there.

5.8.2.2 Installing the New Oracle Database 12c Software

For more information about the current patch set, see SAP Note [1915313](#).

For more information about how to install Oracle Database Release 12.1 software, see SAP Note [1915301](#).

During the software installation of Oracle 12c use the new recommended `ORACLE_BASE/oracle/<DBSID>`.

Prerequisites

A graphical user interface (GUI), for example `x11`, is required for the Oracle database software installation with `runInstaller`. For more information, see the documentation of your operating system.

Procedure

1. Log on as the Oracle database software owner, that is the `oracle` user.
2. Change to the `stage` directory:
`cd /oracle/stage/121/database/SAP`
3. Make sure that `umask` is set to 022 by entering the following command:
`umask 022`
4. Make sure that the `DISPLAY` (for dialog mode) and `DB_SID` variables are set in the environment.
5. Start the OUI with the Oracle database software owner, that is the `oracle` user, as follows:
`./RUNINSTALLER`
 For silent operation, enter this command:
`./RUNINSTALLER -oracle_base /oracle/<DBSID> -silent -nocheck`
 For more information on further options, see SAP Note [1915301](#).
6. Respond to the OUI as follows:

Table 45:

Prompt or Condition	Action
<i>Configure Security Updates</i>	Do not select the checkbox. The runInstaller issues a warning. Choose <i>Next</i> and then <i>Yes</i> .
<i>Select Installation Option</i>	Confirm the pre-selected default <i>Install database software only</i> by choosing <i>Next</i> .
<i>Grid Installation Options</i>	Confirm the default selection <i>Single Instance database installation</i> and then choose <i>Next</i> .
<i>Select Product Language</i>	Confirm the default option <i>English</i> and then choose <i>Next</i> .
<i>Select Database Edition</i>	Confirm the default option <i>Enterprise Edition</i> and then choose <i>Next</i> .
<i>Specify Installation Location</i>	This screen displays the value of <code>ORACLE_BASE</code> , which is set in the environment, and which should be <code>/oracle/<DBSID></code> . This screen also displays the value of <code>ORACLE_HOME</code> , which should be <code>/oracle/<DBSID>/<release></code> , and <code>ORACLE_BASE</code> , which should be <code>/oracle/<DBSID></code> . See SAP Note 1521371 for more information on setting <code>ORACLE_BASE</code> for your configuration. Select <i>Next</i> . If you see the following error message from the OUI, you can safely ignore it and continue with the installation: [INS-32008] Oracle base location can't be same as user home directory

Prompt or Condition	Action
<i>Create Inventory</i>	<p>This screen displays the default parameters for creation of the inventory directory.</p> <p>To accept the defaults, choose <i>Next</i>.</p>
<i>Privileged Operating System Groups</i>	<p>This screen displays the operating system groups:</p> <ul style="list-style-type: none"> ○ OSDBA : dba ○ OSOPER : oper ○ OSBACKUPDBA : oper ○ OSDGDBA : dba ○ OSKMDBA : dba <p>Leave the default and continue with <i>Next</i>.</p>
<i>Perform Prerequisite Checks</i>	<p>This screen checks if all the required system prerequisites for installation of the database software have been met. If some of the checks are displayed as <i>Failed</i>, you can fix these problems by choosing <i>Fix & Check Again</i>.</p> <div style="background-color: #fff9c4; padding: 10px; border: 1px solid #ccc;"> <p>➔ Recommendation</p> <p>We strongly recommend you to make sure that there are no failed checks before starting the software installation.</p> </div> <p>If not all prerequisites are met and you decide to ignore the warnings about failed checks, you later see the OUI warning [INS-13016].</p>
<i>Summary</i>	<p>Review the information displayed on this screen and choose <i>Install</i>.</p>
<i>Finish</i>	<p>Finish the software installation by executing the <code>root.sh</code> script as the <code>root</code> user from another session.</p> <p>If <code>root.sh</code> prompts you that a file (<code>dbhome</code>, <code>oraenv</code>, <code>coraenv</code>) already exists, allow <code>root.sh</code> to overwrite it so that the new version is copied.</p> <p>If this is the first Oracle product you have installed on this host, also run the <code>oraInstroot.sh</code> script from the central inventory as follows:</p> <p><code>\$Oracle_Home/oraInventory/oraInstRoot.sh</code></p> <div style="background-color: #fff9c4; padding: 10px; border: 1px solid #ccc;"> <p>🔗 Example</p> <p>If you are using <code>sudo</code> to change to a <code>root</code> user, you run the following command:</p> <p><code>/usr/local/bin/sudo \$ORACLE_HOME/oraInventory/oraInstRoot.sh</code></p> </div>

7. To exit the OUI, choose *Exit* and confirm the dialog box that appears. In the event of error during the software installation, see the troubleshooting information in SAP Note [1915299](#).

Result

The Oracle 12c database software is now installed . The installation location is referred to – for example, in SAP Notes – as Installation Oracle Home <IHRDBMS>.

Example

```
/oracle/<DBSID>/12102
```

You now have to [install the required SAP bundle patch \[page 135\]](#).

5.8.2.3 Installing the Current SAP Bundle Patch

Use

After the installation of the Oracle Database patch set, you need to install the current (or latest) SAP bundle patch (SBP) into the new Oracle home.

The SBP also delivers a set of upgrade scripts that automate most of the pre-upgrade and post-upgrade tasks.

Only valid for 'Platform': AIX

Caution

AIX only: Make sure that you install the latest SAP Bundle Patch (SBP) immediately after the Oracle software installation. For more information, see SAP Note [1915316](#). Otherwise you might have problems during the *Create Database* phase of the database instance installation.

End of 'Platform': AIX

Prerequisites

Check SAP Note [1914631](#) to find a cross-reference to the current SAP Note with the list of required patches to be installed. You must install the SBP using the Oracle tool MOPatch. For more information about MOPatch, see SAP Note [1027012](#).

Procedure

1. Download the required patches.
2. Log on as the Oracle database software owner, that is the `oracle` user.
3. Install the SBP into the new Oracle home according to the instructions in the SBP README file.

i Note

The installation of the SBP consists of these steps:

1. The installation of the SBP software into the Oracle home.
This step must be completed before the database is upgraded.
2. The change of the database structure and database properties (dictionary, parameter, and properties)
This step must be done immediately after the database has been upgraded. For more information, see *Performing SAP Bundle Patch Post-Installation Steps*.

6 Post-Installation

6.1 Post-Installation Checklist

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

i Note

You do not have to perform some of these post-installation steps if one of the following is true:

- **Only valid for SAP systems based on SAP NetWeaver 7.4 and higher:** You already completed these steps as part of task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation completed – see also [SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup \[page 140\]](#).
- You already completed these steps as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (`ST-ICO`).

The sections describing these steps are specified with a corresponding note at the beginning.

- Standard, distributed, or high-availability system
- Additional application server instance

Detailed information about the steps is available in the relevant chapter.

Standard, Distributed, or High-Availability System

i 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 \[page 163\]](#) immediately after the installation has finished.
2. You check and if necessary modify the settings for the operating system users for your SAP system if they were created by the installer.
For more information, see [Creating Operating System Users and Groups \[page 70\]](#).
3. You check whether you can [log on to the Application Server ABAP \[page 139\]](#).
4. **SAP systems based on SAP NetWeaver 7.40 and higher only:** You [perform the automated initial setup \[page 140\]](#).

i Note

This step is optional.

5. You [install the SAP license \[page 141\]](#).
6.

Only valid for 'High Availability': HA (UNIX)
You [set up the licenses for high availability \[page 143\]](#).
End of 'High Availability': HA (UNIX)
7. You [configure the remote connection to SAP support \[page 144\]](#).
8. You [install the SAP online documentation \[page 145\]](#).
9. You [perform the consistency check \[page 145\]](#).
10. You [configure the Transport Management System \[page 146\]](#).
11. You [apply the latest kernel and Support Packages \[page 148\]](#).
12. You perform [post-installation steps for the application server ABAP \[page 149\]](#).
13. If required, you [install additional languages and perform language transport \[page 152\]](#).
14. **SAP Kernel Release 7.40 and Higher:** You perform [IP Multicast Configuration \[page 153\]](#).
15. You [configure the Process Integration system after installation \[page 154\]](#).

i Note

This post-installation step is only relevant if you have installed an **SAP NetWeaver 7.5** Process Integration (PI) system.

16. You [configure the user management \[page 155\]](#).
17. You [ensure user security \[page 155\]](#).
18. You [perform the client copy \[page 159\]](#).
19. On the database instance host, you [perform Oracle-specific post-installation steps \[page 160\]](#).
20. **SAP systems based on SAP NetWeaver 7.40 and higher only:** If required, you [change the keys for the secure storage \[page 162\]](#).
21. You [perform a full installation backup \[page 163\]](#).
22. You check the Master Guide for your SAP Business Suite application or SAP NetWeaver application (chapter *Configuration of Systems and Follow-Up Activities*) for further implementation and configuration steps, such as language installation, monitoring, work processes, transports, SAP license, printers, system logs, and connectivity to system landscape directory (SLD).

Additional Application Server Instance

1. If required, you [perform an installation backup \[page 163\]](#) immediately after the installation has finished.
2. You check and if necessary modify the settings for the operating system users for your SAP system if they were created by the installer.
For more information, see [Creating Operating System Users and Groups \[page 70\]](#).
3. You check whether you can [log on to the Application Server ABAP \[page 139\]](#).
4. You [install the SAP online documentation \[page 145\]](#).
5. You [ensure user security \[page 155\]](#).
6. You [perform a full installation backup \[page 163\]](#).
7. If you chose to install an integrated SAP Web Dispatcher instance within the ASCS instance, you [log on to the SAP Web Dispatcher Management Console \[page 166\]](#)
8. If you chose to install an integrated SAP Web Dispatcher instance within the ASCS instance, you [configure the SAP Web Dispatcher \[page 168\]](#)

6.2 Logging On to the Application Server ABAP

You need to check that you can log on to the Application Server ABAP with the standard users, given in the table below.

Prerequisites

- The SAP system is up and running.
- You have installed the SAP front-end software.

Context

i Note

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

Table 46:

User	User Name	Client
SAP system user	SAP*	000, 001, 066
	DDIC	000, 001

i Note
Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5. For more information, see SAP Note [1749142](#).

You access the application server ABAP using *SAP Logon*.

Procedure

1. Start *SAP Logon* on the host where you have installed the SAP front-end software as follows:
 - SAP GUI for Windows:
On the host where you have installed the front end, choose:
► Start ► Programs ► SAP Front End<Release> ► SAPlogon ►

- SAP GUI for Java:
Enter the following command from the GUI installation directory:
`guilogon`
- 2. Create a logon entry for the newly installed system in the *SAP Logon*.
For more information about creating new logon entries, press `F1`.
- 3. When you have created the entry, log on as user `SAP*` or `DDIC`.

6.3 SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional)

After the installation of a new SAP system based on SAP NetWeaver 7.4 and higher, you have to configure the system to enable its usage. For example, you have to install an SAP license, create logon groups, and configure the Transport Management System (TMS) and security settings. Instead of performing these initial setup tasks manually, you can profit from an automated initial setup.

Prerequisites

Note that the best point in time when you perform automated initial setup depends on the following:

- If you have run the installation using a stack configuration file (also called “up-to-date installation”), we recommend that you proceed as follows:
 1. Perform the **complete** installation and update process - that is the installation with Software Provisioning Manager **and** the update with Software Update Manager.
 2. Perform the automated initial setup.By running first the update and then the automated initial setup, you can profit from latest features and fixes in the initial setup configuration content.
Background: As of Software Logistics Toolset 1.0 SPS12, the installation procedure with Software Provisioning Manager 1.0 SP07 and higher also includes basic configuration activities, such as initial basic configuration of transport management, which are a prerequisite for the subsequent maintenance process. In previous SP versions of Software Logistics Toolset 1.0, this prerequisite had to be fulfilled by running automated initial setup before the update process.
- If you have **not** run the installation using a stack configuration file (also called “up-to-date installation”), we recommend that you proceed as follows:
 1. Run automated initial setup directly after the installation, using the automation content provided with the system load.
 2. Apply the Support Packages to benefit from the already performed initial configuration – for example, using the already configured Transport Management System.
 3. Consider running the automated initial setup a second time, especially if you want to benefit from the latest improvements and fixes offered by the updated automation content provided by the applied Support Package.

For more information about automated initial setup, see the SAP Community Network at <http://scn.sap.com/docs/DOC-41405>.

Procedure

1. Start the ABAP Task Manager by calling transaction STC01.
2. Choose task list `SAP_BASIS_SETUP_INITIAL_CONFIG`.
3. Select the tasks you want to get executed.

For this, the task list offers sophisticated online documentation of the comprised activities.

4. Choose *Execute*.

You are guided through the configuration steps where you can enter the required values.

Related Information

[Installation Using a Stack Configuration File \[page 30\]](#)

[Installing the SAP License \[page 141\]](#)

[Configuring the Remote Connection to SAP Support \[page 144\]](#)

[Configuring the Change and Transport System \[page 146\]](#)

[Applying the Latest Kernel and Support Package Stacks \[page 148\]](#)

[Performing Post-Installation Steps for the ABAP Application Server \[page 149\]](#)

[Performing the Consistency Check \[page 145\]](#)

6.4 Installing the SAP License

You must install a **permanent** SAP license. When you install your SAP system, a **temporary** license is automatically installed.

Context

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.

For more information about SAP license keys and how to obtain them, see <http://support.sap.com/licensekey>.

i Note

You do not have to perform these steps if one of the following is true:

- **Only valid for SAP systems based on SAP NetWeaver 7.4 and higher:** You already completed these steps as part of task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation had completed.
- You already completed these steps as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (`ST-ICO`).

Procedure

Install the SAP license as described in the SAP Library at:

Only valid for 'High Availability': HA (UNIX)

i Note

If you have installed a high-availability system, proceed as described in [High Availability: Setting Up Licenses \[page 143\]](#).

End of 'High Availability': HA (UNIX)

Table 47:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">◦ SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0◦ SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0	See the SAP NetWeaver Mobile Library i Note Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.
<ul style="list-style-type: none">◦ SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71◦ SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711	▶ Application Help ▶ SAP Library ▶ SAP NetWeaver Mobile Library ▶ Administrator's Guide ▶ Configuration ▶ General Configuration Tasks ▶ License Configuration ▶

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.3 http://help.sap.com/nw73 ○ SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Solution Life Cycle Management</i> ▶ <i>SAP Licenses</i> ▶</p>

6.5 High Availability: Setting Up Licenses

This topic is only valid for 'High Availability': HA (UNIX)

You need to install a **permanent** license, which is determined by the hardware environment of the message server.

Prerequisites

The SAP system is up and running.

Context

SAP has implemented a license mechanism for 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 ABAP central services instance (ASCS instance) runs.

To be able to perform a switchover, the **temporary** license that is installed automatically with the ASCS instance is not sufficient. You first need to install a **permanent** license, which is determined by the hardware environment of the message server. Since SAP's high-availability (HA) solution stipulates two or more cluster nodes (host machines) where the message server is enabled to run, you have to order as many [license keys \[page 141\]](#) as you have cluster nodes.

When we receive confirmation from your vendor that you are implementing a switchover environment, we provide the required license keys for your system, one key for each machine.

Procedure

1. To find the hardware ID of the primary host, log on to any application server instance of the SAP system and call transaction `SLICENSE`.
2. Perform a switchover of the ABAP central services instance (ASCS) to another node in the cluster and repeat the previous step.

Repeat this for all remaining nodes in the cluster.

3. To obtain the two license keys, enter the hardware IDs for each cluster node, where message server is enabled to run: <http://support.sap.com/licensekey>
 4. To import the files containing the two licenses, log on to any application server instance of the SAP system and call transaction `SLICENSE`.
 5. Perform a switchover of the ABAP central services instance (ASCS) to another node in the cluster and repeat the previous step.
- Repeat this for all remaining nodes in the cluster.

Results

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

End of 'High Availability': HA (UNIX)

6.6 Configuring the Remote Connection to SAP Support

SAP offers its customers access to support and a number of remote services such as the `Early Watch Service` or the `GoingLive Service`. Therefore, you have to set up a remote network connection to SAP.

For more information, see SAP Support Portal at <https://support.sap.com/remote-support.html>.

i Note

You do not have to perform these steps if one of the following is true:

- **Only valid for SAP systems based on SAP NetWeaver 7.4 and higher:** You already completed these steps as part of task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation had completed.
- You already completed these steps as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (`ST-ICO`).

6.7 Installing the SAP Online Documentation

Use

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

Process

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

6.8 Performing the Consistency Check

We recommend that you check the consistency of the newly installed SAP ABAP system.

When logging on to the system for the first time, you need to trigger a consistency check manually. The function is then called automatically whenever you start the system or an application server.

i Note

You do not have to perform these steps if one of the following is true:

- **Only valid for SAP systems based on SAP NetWeaver 7.4 and higher:** You already completed these steps as part of task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation had completed.
- You already completed these steps as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (`ST-ICO`).

The following checks are performed:

- Completeness of installation
- Version compatibility between the SAP release and the operating system
The initial consistency check determines whether:
 - The release number in the SAP kernel matches the release number defined in the database system
 - The character set specified in the SAP kernel matches the character set specified in the database system
 - Critical structure definitions that are defined in both the data dictionary and the SAP kernel are identical.
The structures checked by this function include `SYST`, `T100`, `TSTC`, `TDCT` and `TFDIR`.
- Accessibility of the message server
- Availability of all work process types
- Information about the enqueue server and the update service

Prerequisites

- If the installation finished successfully, your SAP system should be up and running. Otherwise, start it as described in [Starting and Stopping SAP System Instances \[page 192\]](#).
- You have [logged on to the SAP system \[page 139\]](#).

Procedure

1. Perform a system check:
Call transaction `SICK`.
You should see the entry `SAP System Check | no errors reported`
2. Perform a database check:
In the DBA Cockpit (transaction `DBACOCKPIT`), check for missing tables or indexes by choosing [▶ Diagnostics](#)
[▶ Missing Tables and Indexes ▶](#).

6.9 Configuring the Change and Transport System

You have to perform some steps in the Transport Management System to be able to use the Change and Transport System (TMS).

Context

You do **not** have to perform these steps or at least some of these steps if one of the following is true:

- **Only valid for SAP systems based on SAP NetWeaver 7.4 and higher:** You already completed these steps as part of task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation had completed.
Note that `SAP_BASIS_SETUP_INITIAL_CONFIG` only covers the configuration of TMS as single system.
- You are using a stack configuration file (see [Installation Using a Stack Configuration File \(Optional\) \[page 30\]](#)) and chose [Run TMS Configuration \(for Single System\)](#) during the installation.
- You already completed these steps as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (`ST-ICO`).

Procedure

1. Call transaction `STMS` in the ABAP system to configure the domain controller in the Transport Management System (TMS).

For more information, see the SAP Library at:

Table 48:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 ○ SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library</p> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p>
<ul style="list-style-type: none"> ○ SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 ○ SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Application Server ABAP / ABAP Technology</i> ▶ <i>Administration Tools for AS ABAP</i> ▶ <i>Change and Transport System</i> ▶ <i>Transport Management System (BC-CTS-TMS)</i> ▶ <i>Configuring TMS</i> ▶</p>
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.3 http://help.sap.com/nw73 ○ SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Solution Life Cycle Management</i> ▶ <i>Software Logistics</i> ▶ <i>Change and Transport System</i> ▶ <i>Change and Transport System – Overview</i> ▶ <i>Basics of the Change and Transport System</i> ▶ <i>Transport Management System – Concept</i> ▶</p>

2. In addition, you must configure the system change options.

For more information, see the SAP Library at:

Table 49:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 ○ SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library</p> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p>

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 ○ SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ Application Help ▶ Function-Oriented View: English ▶ Application Server ABAP / ABAP Technology ▶ Administration Tools for AS ABAP ▶ Change and Transport System ▶ Transport Organizer (BC-CTS-ORG) ▶ Requirements for Working with the Transport Organizer ▶ Setting the System Change Option ▶</p>
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.3 http://help.sap.com/nw73 ○ SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ Application Help ▶ Function-Oriented View: English ▶ Solution Life Cycle Management ▶ Software Logistics ▶ Change and Transport System ▶ Transport Organizer (BC-CTS-ORG) ▶ Requirements for Working with the Transport Organizer ▶ Setting the System Change Option ▶</p>

3. Call transaction `SE38` to schedule a dispatcher job for transport programs by executing report `RDDIMPDP`. You schedule the transport dispatcher in the current client. This is equivalent to the execution of job `RDDNEWPP` in transaction `SE38`

6.10 Applying the Latest Kernel and Support Package Stacks

We strongly recommend that you apply the latest kernel and Support Package stacks from SAP Service Marketplace before you start configuring your SAP system.

i Note

If you are using a stack configuration file (see [Installation Using a Stack Configuration File \(Optional\)](#) [page 30]), you already downloaded the `stack.xml` file and the delta archives using the Maintenance Optimizer in your SAP Solution Manager. If you then already called the Software Update Manager (SUM) from the installer and applied the Support Package Stacks after the installation had finished, you can skip this section.

For more information about release and roadmap information for the kernel versions and how this relates to SAP NetWeaver support packages, including important notes on downward compatibility and release dates, see the document *Understanding Kernel Releases for the SAP NetWeaver AS ABAP* at <http://scn.sap.com/docs/DOC-54170>.

i Note

If you have installed an **SAP Solution Manager 7.2** system, you must apply at least Support Package Stack (SPS) 01. You cannot use SAP Solution Manager 7.2 with SPS 00.

Procedure

- Download and apply the latest Kernel and Support Package stacks using the Software Update Manager (SUM) as described in the documentation *Updating SAP Systems Using Software Update Manager 1.0 SP<Number>* available at <http://help.sap.com/slttoolset> ► *Area System Maintenance* ► *Software Update Manager (SUM) 1.0 SP <Most Current Number>* ► *Guides for SUM* ►
- If you want to update the kernel manually, proceed as described below:
 1. Log on as user `<sapsid>adm` to the hosts of the SAP system instances to be updated.
 2. Download the latest kernel for your operating system and database platform as described in SAP Note [19466](#).
 3. Back up the kernel directory that is specified by the profile parameter `DIR_CT_RUN`.
 4. Extract the `SAR` files of the kernel Support Packages of the target SP level to a temporary directory using the `SAPCAR` tool.
 5. Copy or move the extracted programs from the temporary directory to the local kernel directory.
 6. Adjust the ownership and permissions of the kernel binaries by entering the following command sequence (Execute the `saproot.sh` script that is located in the kernel directory):

```
su - root
cd <Kernel_Directory>
./saproot.sh <SAPSID>
exit
```

6.11 Performing Post-Installation Steps for the ABAP Application Server

You have to perform the following post-installation steps for the ABAP application server:

i Note

You do not have to perform these steps if one of the following is true:

- **Only valid for SAP systems based on SAP NetWeaver 7.4 and higher:** You already completed these steps as part of task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation had completed.
- You already completed these steps as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (`ST-ICO`).

- Upload and set system profiles using transaction `RZ10`
- Create logon and RFC server groups using transactions `SMLG` and `RZ12`
- Create operation modes using transaction `RZ04`
- Schedule standard jobs using transaction `SM36`
- Configuration of SLD data supplier using transaction `RZ70`
- Perform load generation using transaction `SGEN`

For more information, see the appropriate sections below.

Prerequisites

You have logged on to the ABAP application server as described in [Logging On to the Application Server \[page 139\]](#).

Procedure

Upload and Set System Profiles using Transaction RZ10

You upload system profiles, such as default profile and instance profile, from the file system into the database of the target system using transaction RZ10.

For more information about how to maintain SAP system profiles, see the SAP Library at:

Table 50:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Application Server ABAP / ABAP Technology</i> ▶ <i>Administration Tools for AS ABAP</i> ▶ <i>Configuration in the CCMS</i> ▶ <i>Profiles</i> ▶ <i>Maintaining Profiles</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.3 http://help.sap.com/nw73 SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Application Server</i> ▶ <i>Application Server ABAP</i> ▶ <i>Administration of Application Server ABAP</i> ▶ <i>Monitoring and Administration Tools for Application Server ABAP</i> ▶ <i>Configuration in the CCMS</i> ▶ <i>Profiles</i> ▶ <i>Maintaining Profiles / Profile Maintenance</i> ▶</p>

Create Logon and RFC Server Groups using Transactions SMLG and RZ12

You create the following:

- Logon groups using transaction SMLG
- RFC server groups using transaction RZ12

Specify the following:

- Name of the logon or RFC server group
- Instance name (application server)
- Group type attributes are optional

If required, you create the RFC server group `parallel_generators`.

Create Operation Modes using Transaction RZ04

You check for existing operation modes and - if required - create a new operation mode using transaction `RZ04`.

Specify the following:

- Name of the operation mode
- Short description
- Optional: monitoring properties variant

Select the corresponding checkbox to assign the operation mode to the following:

- Time table (assignment only from 0-24 h)
- Current application server instance

Schedule Standard Jobs using Transaction SM36

You schedule SAP standard jobs using transaction `SM36`.

If a standard job is already scheduled, it is kept. Only missing jobs are scheduled.

Configuration of SLD Data Supplier using Transaction RZ70

1. Make sure that the SLD and the SLD bridge (the receiving thread of the SLD, which runs on a Java EE engine) are running.
2. Configure the System Landscape Directory (SLD) data supplier with default settings, using transaction `RZ70`.

Perform Load Generation using Transaction SGEN

You generate the ABAP loads using transaction `SGEN`. ABAP loads are platform-dependent programs that are generated during runtime and stored in database tables. Using transaction `SGEN` you can generate ABAP loads of a number of programs, function groups, classes, and so on.

Choose one of the following generation modes:

- Generate All Objects
All existing objects of all software components are generated synchronously. Job `RSPARGENER8M` starts the generation directly after all ABAP objects have been prepared for generation and have been stored in table `GENSETC`. Be aware that this is a time-consuming process.

i Note

Make sure that you have sufficient space available on your database. The generation of all existing objects requires around 2 - 9 GB of free space.

- Prepare All Objects for Generation
All objects to be generated are prepared for generation and stored in table `GENSETM`. You can start the generation of these objects later with transaction `SGEN`. Choose this strategy if object generation is to be done outside the configuration task due to performance issues.

6.12 Installing Additional Languages and Performing Language Transport

This section tells you how to install and transport additional languages.

i Note

You do not have to perform these steps if you already completed these steps as configuration tasks in an implementation project with SAP Solution Manager Content (ST-ICO).

You do not have to perform these steps or at least some of these steps if one of the following is true:

- You are using a stack configuration file (see [Installation Using a Stack Configuration File \(Optional\)](#) [page 30]) and chose *Run TMS Configuration (for Single System)* during the installation.
- You already completed these steps as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (ST-ICO).

Procedure

1. Configure the language settings by using transaction `I18N` and choosing **I18N Customizing** > **I18N System Configuration** or by executing report `RSCPINST` directly. For more information, see SAP Note [42305](#).

Only valid for 'Platform': AIX

If you wish to use the Turkish locale with SAP on AIX, you must install the Turkish locale supplied by SAP instead of the one supplied with the operating system. For more information, see SAP Note [39718](#).

End of 'Platform': AIX

2. Perform the language transport using transaction `SMLT`:

i Note

German is already available in the system. Do not transport it via `SMLT`.

1. Classify the language.
2. Schedule the language transport.
3. Schedule the language supplementation.

i Note

You can also install additional languages later, but if you install any Support Packages in the meantime, you have to do one of the following:

- Install the Support Packages again.
- Use the report `RSTLAN_IMPORT_OCS` to extract the language-relevant information from each Support Package.

More Information

For information about the language transport, see the SAP Library at:

Table 51:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ Application Help ▶ Function-Oriented View: English ▶ Application Server ABAP / ABAP Technology ▶ Administration Tools for AS ABAP ▶ Change and Transport System ▶ Language Transport (BC-CTS-LAN) ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.3 http://help.sap.com/nw73 SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ Application Help ▶ Function-Oriented View: English ▶ Solution Life Cycle Management ▶ Software Logistics ▶ Change and Transport System ▶ Language Transport (BC-CTS-LAN) ▶</p>

6.13 SAP Kernel 7.40 and Higher: IP Multicast Configuration

Since SAP kernel release 7.40, the ABAP application server (AS ABAP) uses IP multicast datagrams with host local scope to wake up the internal processes (such as dispatcher, Gateway, internet communication manager, work processes) when dispatching requests.

Since SAP kernel release 7.40 Patch Level (PL) 46 and 7.41 PL 13, the dispatcher checks during startup whether local IP multicast communication is working properly.

You have to adjust the network configuration of AS ABAP as described in SAP Note [1931675](#) to ensure that local IP multicast communication works properly.

6.14 PI: Configuring the Process Integration System After the Installation

To configure your Process Integration (PI) system after installation, execute the “SAP NetWeaver initial setup” CTC Wizard.

i Note

This post-installation step is only relevant if you have installed an **SAP NetWeaver 7.5 Process Integration (PI)** system.

To configure your Process Integration (PI) system, execute the “SAP NetWeaver initial setup” CTC Wizard described in SAP Note [1309239](#).

i Note

The CTC Wizard automatically executes all required technical configuration steps.

Prerequisites

If you have installed an **SAP NetWeaver 7.5 Process Integration** system and you intend to run automated configuration using the Central Technical Configuration (CTC) Wizard after the installation, make sure that the ABAP communication port is either completely configured for HTTPS or optionally for HTTP, for example by configuring the ABAP communication port during the installation process (see the *Ports* table in section [SAP System Parameters \[page 48\]](#)). You can only run the CTC Wizard if the ABAP communication port is configured.

More Information

For more details about all single configuration steps executed by the CTC Wizard and how to apply them manually, see the SAP Library at:

Table 52:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
SAP NetWeaver 7.5 http://help.sap.com/nw75	▶ Application Help > Function-Oriented View: English > Process Integration > Configuring Process Integration After Installation > Configuring Process Integration (PI) Dual Usage Type > Basic Configuration for SAP Process Integration (PI) ▶

6.15 Configuring User Management

After the installation of your SAP system has finished, you must decide whether you want to do the following:

- Add the system to Central User Administration (CUA)
- Use Lightweight Directory Access Protocol (LDAP) synchronization

For more information, see the SAP Library at:

Table 53:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> • SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 • SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library</p> <p>Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p>
<ul style="list-style-type: none"> • SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 • SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ Application Help ▶ Function-Oriented View: English ▶ Security ▶ Identity Management ▶ Identity Management for System Landscapes ▶ Integration of User Management in Your System Landscape ▶ Adding an ABAP System to Your System Landscape ▶</p>
<ul style="list-style-type: none"> • SAP NetWeaver 7.3 http://help.sap.com/nw73/ • SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 • SAP NetWeaver 7.4 http://help.sap.com/nw74 • SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ Application Help ▶ Function-Oriented View: English ▶ Security ▶ Identity Management ▶ Identity Management for System Landscapes ▶ Integration of User Management in Your System Landscape ▶ Adding an ABAP System to Your System Landscape ▶</p>

6.16 Ensuring User Security

You need to ensure the security of the users that the installer created during the installation.

The tables below at the end of this section list the following users:

- Operating system users
- SAP system users

During the installation, the installer by default assigned the master password to all users created during the installation unless you specified other passwords.

➔ Recommendation

In all cases, the user ID and password are encoded only 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.

⚠ Caution

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

Procedure

For the users listed below, take the precautions described in the relevant SAP security guide.

Security guides can be found at <http://help.sap.com> |>> <Product Area> > <Product> > <Release> > [Security Information](#) >

Operating System Users

After the installation, operating system users for SAP system, database, and SAP Host Agent are available as listed in the following table:

Table 54: Operating System and Database Users

User	User Name	Comment
Operating system user	<sapsid>adm	SAP system administrator Oracle 12: This is also the default Oracle database administrator
	oracle	Oracle database administrator and Oracle software owner (that is, the owner of the database files) This user is only available with Oracle 12 or Oracle 11 with ASM/Exadata .
	ora<dbsid>	Oracle 11: This is the default Oracle database administrator Oracle 12: This is the additional Oracle database administrator (that is, the owner of the database files)
Oracle database user	SAP<SCHEMA_ID>	Oracle database owner (that is, the owner of the database tables)
	SYSTEM	Oracle standard database user
	SYS	Oracle standard database user

User	User Name	Comment
	OUTLN	Oracle standard database user
	DBSNMP	Oracle standard database user

Table 55: SAP Host Agent User

User Type	User	Comment
Operating system user	sapadm	<p>SAP Host Agent administrator is the user for central monitoring services.</p> <p>You do not need to change the password of this user after the installation.</p> <p>This user is for administration purposes only.</p> <p>You are not able to log on as <code>sapadm</code> as this user is locked.</p>

SAP System Users

After the installation, ABAP system users are available. The following table shows these users together with recommendations on how you can ensure the security of these users:

Table 56: SAP System Users

User	User Name	Comment
SAP system user	SAP*	<p>User exists in at least SAP system clients 000, 001, and 066.</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5. For more information, see SAP Note 1749142.</p> </div>
	DDIC	User exists in at least SAP system clients 000 and 001.
	EARLYWATCH	<p>User exists in at least SAP system client 066.</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5. For more information, see SAP Note 1749142.</p> </div>

User	User Name	Comment
<p>Administrator</p> <p>i Note</p> <p>This user has only been created if you have installed the application server ABAP for an SAP Process Integration (PI) 7.5 system or for an SAP Solution Manager 7.2 system.</p>	<p>The name that you gave this user during the installation or the default name <code>J2EE_ADMIN</code> (see SAP System Parameters [page 48])</p>	<p>This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It has administrative permissions for user management.</p> <p>The password of this user is stored in secure storage. Therefore, whenever you change the password of the administrator password, you must also change the password in secure storage.</p> <p>→ Recommendation</p> <p>We recommend that you use strong password and auditing policies for this user.</p>
<p>Guest</p> <p>i Note</p> <p>This user has only been created if you have installed the application server ABAP for an SAP Process Integration (PI) 7.5 system or for an SAP Solution Manager 7.2 system.</p>	<p>The name that you gave this user during the installation or the default name <code>J2EE_GUEST</code> (see SAP System Parameters [page 48])</p>	<p>This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It is used for anonymous access.</p>
<p>Communication user for Application Server Java</p> <p>i Note</p> <p>This user has only been created if you have installed the application server ABAP for an SAP Process Integration (PI) 7.5 system or for an SAP Solution Manager 7.2 system.</p>	<p>The name that you gave this user during the installation or the default name <code>SAPJSF</code> (see SAP System Parameters [page 48])</p>	<p>This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It is used for a remote function call (RFC) between the ABAP system and the Java system.</p>

6.17 Performing the Client Copy

To get a production client, you have to perform a copy of the SAP reference client.

i Note

You do not have to perform these steps if you already completed them as configuration tasks in an implementation project with SAP Solution Manager 7.1 Content (ST-ICO).

The installer creates three ABAP clients during the installation, client 000, client 001, and client 066.

i Note

Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5. For more information, see SAP Note [1749142](#).

Use client 000 as source client for the client copy.

Only valid for 'Software Component': SAP SCM

i Note

If you want to mark the client 001 as **not** relevant for liveCache, run report `/SAPAPO/OM_NON_LC_RELEVANT_CLT` or `/SLCA_NON_LC_RELEVANT_CLIENT` using transaction SE38.

End of 'Software Component': SAP SCM

Procedure

1. Maintain the new client with transaction SCC4.
2. Activate kernel user SAP*:
 1. Set the profile parameter `login/no_automatic_user_sapstar` to 0.
 2. Restart the application server.
3. Log on to the new client with kernel user **SAP*** and password **PASS**.
4. Copy the client with transaction SCC1 and profile SAP_CUST.
5. Check the log files with transaction SCC3.
6. Create the required users. These users must have at least the authorizations required for user administration and system administration. Create a user SAP* with all required authorizations for this user. If you want to have other users for system administration, you can also create user SAP* without authorizations.
7. Deactivate kernel user SAP*:
 1. Reset `login/no_automatic_user_sapstar` to 1.
 2. Restart the application server.

More Information

For more information about the client copy and about how to perform it, see the SAP Library at :

Table 57:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library</p> <div style="background-color: #fff9c4; padding: 5px;"> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Application Server ABAP / ABAP Technology</i> ▶ <i>Administration Tools for AS ABAP</i> ▶ <i>Change and Transport System</i> ▶ <i>BC – Client Copy and Transport</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.3 http://help.sap.com/nw73 SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Application Server</i> ▶ <i>Application Server ABAP</i> ▶ <i>Administration of Application Server ABAP</i> ▶ <i>Change and Transport System</i> ▶ <i>BC – Client Copy and Transport</i> ▶</p>

6.18 Performing Oracle-Specific Post-Installation Steps

Use

You have to perform the following Oracle-specific post-installation steps:

Procedure

Checking the Recommended Oracle Database Parameters

When installing the Oracle database, a standard database parameter set is used. To take into account the size and configuration of your SAP system, and to enable new Oracle features, check and apply the parameter settings as described in SAP Note [1431798](#) (Oracle 11g) or SAP Note [1888485](#) (Oracle 12c).

You can find an automated script in SAP Note [1171650](#) to help you check whether your SAP system complies with the database parameter recommendations at any given point in time.

Configuring Database User Profiles

If the SAP-specific database user profile `SAPUPROF` is not yet installed in the database, configure it as described in SAP Note [1519872](#).

Updating Oracle Optimizer Statistics

To update the Oracle optimizer statistics, perform the following:

1. Execute the following commands as the `ora<dbSID>` user:


```
brconnect -u / -c -f stats -t system_stats;
brconnect -u / -c -f stats -t oradict_stats;
```
2. Execute the following commands with SQLPlus:


```
SQL> exec dbms_scheduler.disable('GATHER_STATS_JOB');
SQL> exec dbms_scheduler.disable('ORACLE_OCM.MGMT_CONFIG_JOB');
SQL> exec dbms_scheduler.disable('ORACLE_OCM.MGMT_STATS_CONFIG_JOB');
```

 For Oracle 11g, also execute the following command:


```
SQL> exec DBMS_AUTO_TASK_ADMIN.DISABLE
```

 For more information, see SAP Note [974781](#).

Checking the Version of the Oracle Instant Client

If necessary, install the most up-to-date version of the Oracle Instant Client, as described in SAP Note [819829](#).

Configuring and Administering the Oracle Database

You have to configure your Oracle database before you start operating it with the SAP system.

For more information about Oracle database configuration and administration, see the SAP Library at:

Table 58:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> • SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 • SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	See the SAP NetWeaver Mobile Library <div style="background-color: #fff9c4; padding: 5px; margin-top: 10px;"> <p>Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> • SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 • SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ SAP Library ▶ SAP NetWeaver Mobile Library ▶ Administrator's Guide ▶ Technical Operations (TOM) ▶ Administration of Databases ▶ Database Administration for Oracle ▶</p>

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> • SAP NetWeaver 7.3 http://help.sap.com/nw73 • SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 • SAP NetWeaver 7.4 http://help.sap.com/nw74 • SAP NetWeaver 7.5 http://help.sap.com/nw75 	<ul style="list-style-type: none"> ▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Database Administration</i> ▶ <i>Database Administration for Oracle</i> ▶

Installing the Latest Version of BR*Tools for Oracle 12c

Follow the instructions in SAP Note [2087004](#) to install the most recent version of BR*Tools for Oracle 12c.

6.19 SAP Systems Based on SAP NetWeaver 7.4 and Higher: Changing Keys for the Secure Storage

Use

The secure storage in the file system and the secure storage in the database have been encrypted with a randomly generated individual encryption key or with a default key.

In the first case, you have made a backup of the individual key because you need this value in case of failure to recover the data.

No matter what you chose during installation, you can change the encryption key at any time using the respective maintenance tool.

Procedure

- For the secure storage in the file system, the key change is described in the SAP Library at:

Table 59:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<ul style="list-style-type: none"> ▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Security</i> ▶ <i>System Security</i> ▶ <i>System Security for SAP NetWeaver AS ABAP Only</i> ▶ <i>Secure Storage in the File System (AS ABAP)</i> ▶

- For the secure storage in the database, the key change is described in the SAP Library at:

Table 60:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	▶ Application Help ▶ Function-Oriented View: English ▶ Security ▶ System Security ▶ System Security for SAP NetWeaver AS ABAP Only ▶ Secure Storage (ABAP) ▶ Key Management ▶ Using Individual Encryption Keys ▶ Generating Encryption Keys ▶

SAP recommends using an individual encryption key.

More Information

See also the entry *Individual Encryption Key for the Secure Storage* in table *SAP System Parameters* in [SAP System Parameters \[page 48\]](#).

6.20 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 have logged on as user

The UNIX commands used in this procedure work on all hardware platforms. For more information about operating system-specific backup tools, see your operating system documentation. as user

You need to back up the following directories and files:

- All SAP-specific directories:
 - `/usr/sap/<SAPSID>`
 - You have logged on as user as
`/usr/sap/trans`
 - `<sapmnt>/<SAPSID>`
 - Home directory of the user `<sapsid>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 as user `<sapsid>adm` and [stopped the SAP system and database \[page 192\]](#).

Only valid for 'Platform': HP-UX

Use the backup tool of your choice, for example the HP DataProtector and refer to the backup software documentation. You can also use the standard UNIX commands as described below.

End of 'Platform': HP-UX

Backing 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
```

Only valid for 'Platform': Linux

Note

You can also execute the following command to manually create a compressed GNU `tar` archive that contains all installed files and save it to the file system:

```
tar -czf <ARCHIVENAME>.tgz <file_system>
```

End of 'Platform': Linux

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. Go to the location in your file system where you want to restore the backup image.

3. Restore the data with the following commands:

- From tape:

```
cat <tape_device> | compress -cd | tar -xf -
```

- From the file system:

```
cat ARCHIVENAME.tar.Z | compress -cd | tar -xf -
```

Only valid for 'Platform': Linux

i Note

If you want to restore the data from a GNU `tar` archive, you have to execute the following command:

```
tar -xzf <ARCHIVENAME>.tgz
```

End of 'Platform': Linux

Performing a Full Database Backup

1. Configure your third-party backup tool, if used.
2. Perform a full database backup (preferably offline).

If you use `BR*TOOLS` for the backup, refer to *BR*Tools for Oracle DBA* in the documentation *SAP Database Guide: Oracle (BC-DB-ORA-DBA)*, available in the SAP Library at:

Table 61:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 ○ SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library</p> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p>
<ul style="list-style-type: none"> ○ SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 ○ SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ Application Help ▶ SAP Library ▶ SAP NetWeaver Mobile Library ▶ Administrator's Guide ▶ Technical Operations (TOM) ▶ Administration of Databases ▶ Database Administration for Oracle ▶</p>

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.3 http://help.sap.com/nw73/ ○ SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Database Administration</i> ▶ <i>Database Administration for Oracle</i> ▶</p>

6.21 Logging on to the SAP Web Dispatcher Management Console

This section describes how to log on to the SAP Web Dispatcher.

Context

i Note

This step is only required if you chose to install an integrated SAP Web Dispatcher instance within the ASCS instance.

You must log on to the SAP Web Dispatcher Management Console to do the following:

- Check whether the SAP Web Dispatcher was installed successfully,
- Change the password of the `webadm` user,
- Access monitoring and administration tools.

Procedure

1. Open a web browser.
2. Enter the following URL, depending on whether you use HTTP or HTTPS:

`http(s) ://<Webdispatcher_Host>:<HTTP(S)_PORT>/sap/wdisp/admin`

Example

`https://plx282:44300/sap/wdisp/admin`

- Log on as user `webadm` with the password that you entered during the input phase of the installation.

The *SAP Web Dispatcher Monitor* screen appears.

- We recommend that you change the password of `webadm` immediately after the installation for security reasons.

For more information on how to change passwords of existing users using the `Admin Handler`, see the SAP Library at:

Table 62:

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶ <i>Administration of the SAP Web Dispatcher</i> ▶ <i>Using the Web Administration Interface</i> ▶ <i>Area menu</i> ▶ <i>Section "HTTP Handler"</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library.</p> <div style="background-color: #fff9c4; padding: 10px;"> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> SAP NetWeaver Process Integration 7.1 http://help.sap.com/nwpi71 SAP NetWeaver Process Integration 7.1 Including Enhancement Package 1 http://help.sap.com/nwpi711 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶ <i>Administration of the SAP Web Dispatcher</i> ▶ <i>Using the Web Administration Interface</i> ▶ <i>Area menu</i> ▶ <i>Section "HTTP Handler"</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.3 http://help.sap.com/nw73 SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶ <i>Administration of the SAP Web Dispatcher</i> ▶ <i>Using the Web Administration Interface</i> ▶ <i>Area menu</i> ▶ <i>Section "HTTP Handler"</i> ▶</p>

Related Information

[ASCS Instance with Integrated SAP Web Dispatcher \[page 24\]](#)

6.22 SAP Web Dispatcher Configuration

After installing SAP Web Dispatcher, you must configure it to be able to use it.

i Note

This step is only required if you chose to install an integrated SAP Web Dispatcher instance within the ASCS instance.

You can find all relevant information in the SAP Web Dispatcher documentation in the SAP Library at:

Table 63:

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library.</p> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p>
<ul style="list-style-type: none"> SAP NetWeaver Process Integration 7.1 http://help.sap.com/nwpi71 SAP NetWeaver Process Integration 7.1 Including Enhancement Package 1 http://help.sap.com/nwpi711 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶</p>

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none"> • SAP NetWeaver 7.3 http://help.sap.com/nw73 • SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 • SAP NetWeaver 7.4 http://help.sap.com/nw74 • SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i> ▶</p>

Related Information

[ASCS Instance with Integrated SAP Web Dispatcher \[page 24\]](#)

7 Additional Information

The following sections provide additional information about **optional** preparation, installation, and post-installation tasks.

There is also a section describing how to delete an SAP system.

7.1 Integration of LDAP Directory Services

This section explains the benefits of using the SAP system with the Lightweight Directory Access Protocol (LDAP) directory and gives an overview of the configuration steps required to use an SAP system with the directory.

LDAP defines a standard protocol for accessing directory services, which is supported by various directory products such as Microsoft Active Directory, and OpenLDAP `slapd`. Using directory services enables important information in a corporate network to be stored centrally on a server. The advantage of storing information centrally for the entire network is that you only have to maintain data once, which avoids redundancy and inconsistency.

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

i Note

The SAP system can interact with the Active Directory using the LDAP protocol, which defines:

- The communication protocol between the SAP system and the directory
- How data in the directory is structured, accessed, or modified

If a directory other than the Active Directory also supports the LDAP protocol, the SAP system can take advantage of the information stored there. For example, if there is an LDAP directory on a UNIX or Windows server, you can configure the SAP system to use the information available there. In the following text, directories other than the Active Directory that implement the LDAP protocol are called **generic LDAP directories**.

This section does **not** provide information about the use of LDAP directories with the LDAP Connector. For more information about using and configuring the LDAP Connector for an ABAP system, see the the following documentation:

Table 64:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>Identity Management of the Application Server ABAP</i> ▶ <i>Configuration of User and Role Administration</i> ▶ <i>Directory Services</i> ▶ <i>LDAP Connector</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	<p>See the SAP NetWeaver Mobile Library.</p> <div style="background-color: #fff9c4; padding: 10px;"> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> SAP NetWeaver Process Integration 7.1 http://help.sap.com/nwpi71 SAP NetWeaver Process Integration 7.1 Including Enhancement Package 1 http://help.sap.com/nwpi711 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>Identity Management of the Application Server ABAP</i> ▶ <i>Configuration of User and Role Administration</i> ▶ <i>Directory Services</i> ▶ <i>LDAP Connector</i> ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.3 http://help.sap.com/nw73 SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>User and Role Administration of Application Server ABAP</i> ▶ <i>Configuration of User and Role Administration</i> ▶ <i>Directory Services</i> ▶ <i>LDAP Connector</i> ▶</p>

Prerequisites

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

- Make sure that the required software is installed:

Table 65:

Operating System	Required Software
AIX	IBM Tivoli Directory Server client packages
HP-UX	The LDAP libraries listed in SAP Note 541344
Linux	You must have at least the following RPM packages installed: <ul style="list-style-type: none"> ○ Oracle Linux: openldap2 ○ Red Hat Linux: openldap2 ○ SUSE LINUX openldap2 openldap2-client
Solaris	You must have at least the <code>libldap.so</code> library installed.

Features

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

- SAP Logon
- The SAP Microsoft Management Console (SAP MMC)
For more information about the automatic registration of SAP components in LDAP directories and the benefits of using it in SAP Logon and SAP MMC, see the documentation *SAP System Information in Directory Services* at:
<http://scn.sap.com/docs/DOC-14384>
- The SAP Management Console (SAP MC)

SAP Logon

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

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

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

Distinguish the following cases:

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

For more information, see the SAP system profile parameter `ldap/servers`.

- For other directory services, you can use `LDAPnode` to specify the distinguished name of the SAP root node. For more information, see the SAP system profile parameter `ldap/saproot`.

SAP MMC

The SAP MMC is a graphical user interface (GUI) for administering and monitoring SAP systems from a central location. It is automatically set up when you install an SAP system on Windows. If the SAP system has been prepared correctly, the SAP MMC presents and analyzes system information that it gathers from various sources, including the Active Directory.

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

If you need to administer distributed systems, we especially recommend that you use the SAP MMC together with Active Directory services. You can keep track of significant events in all of the systems from a single SAP MMC interface. You do not need to manually register changes in the system configuration. Instead, such changes are automatically updated in the directory and subsequently reflected in the SAP MMC.

If your SAP system is part of a heterogeneous SAP system landscape that comprises systems or instances both on Unix and Windows operating systems, you can also use the SAP MMC for operating and monitoring the instances running on Unix.

SAP MC

The SAP MC is a graphical user interface (GUI) for administering and monitoring SAP systems from a central location. The SAP MC is automatically set up when you install an SAP system on any platform. If the SAP system has been prepared correctly, the SAP MC presents and analyzes system information that it gathers from various sources, including a generic LDAP Directory.

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

For more information about the SAP MC and about how to configure it to access LDAP directories, see the documentation *SAP Management Console* at the following locations:

Table 66:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<p>▶▶ Application Help ▶ Function-Oriented View ▶ Application Server Infrastructure ▶ SAP Management Console ▶</p>
<ul style="list-style-type: none"> SAP NetWeaver 7.3 http://help.sap.com/nw73 SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶▶ Application Help ▶ Function-Oriented View: English ▶ Solution Life Cycle Management ▶ SAP Management Console ▶</p>

Configuration Tasks for LDAP Directories

This section describes the configuration tasks for the Active Directory or other (generic) LDAP directories.

Configuration Tasks for Active Directory

To enable an SAP system to use the features offered by the Active Directory, you have to configure the Active Directory so that it can store SAP system data.

To prepare the directory, you use the installer to automatically:

- Extend the Active Directory schema to include the SAP-specific data types
- Create the domain accounts required to enable the SAP system to access and modify the Active Directory. These are the group `SAP_LDAP` and the user `sapldap`.
- Create the root container where information related to SAP is stored
- Control access to the container for SAP data by giving members of the `SAP_LDAP` group permission to read and write to the directory

You do this by running the installer on the Windows server on which you want to use Active Directory Services and choosing ▶ [Generic Installation Options](#) ▶ [<Database>](#) ▶ [Preparations](#) ▶ [LDAP Registration](#) ▶ [Active Directory Configuration](#) ▶. For more information about running the installer on Windows, see the documentation *Installation Guide – <Product> on Windows: <Database>*.

i Note

You have to configure the directory server only **once**. Then all SAP systems that need to register in this directory server can use this setup.

Configuration Tasks for Generic LDAP Directories

To configure other LDAP directories, refer to the documentation of your directory vendor.

Enabling the SAP System LDAP Registration

Once you have correctly configured your directory server, you can enable the LDAP registration of the SAP system by setting some profile parameters in the default profile.

To do this, [run the installer \[page 110\]](#) **once** for your system and choose:

► *Generic Installation Options* ► *<Database>* ► *Preparations* ► *LDAP Registration* ► *LDAP Support* ►

If you use a directory server other than Microsoft Active Directory and/or non-Windows application servers, you have to store the directory user and password information by using `ldappasswd pf=<any_instance_profile>`. The information is encrypted for storage in `DIR_GLOBAL` and is therefore valid for all application servers. After restarting all application servers and start services, the system is registered in your directory server. The registration protocols of the components are `dev_ldap*`. The registration is updated every time a component starts.

7.2 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 and all the major databases for the SAP system. 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 system then creates new tablespaces and a new database schema.
- The installation of an additional SAP system in an existing database (MCOD)
The system then automatically creates additional tablespaces in the existing database and a schema user in the existing database.

Prerequisites

- For more information about MCOD and its availability on different platforms, see <http://scn.sap.com/docs/DOC-8559>.
- Since SAP does not support mixed solutions with MCOD, your SAP system must contain Unicode SAP instances only.
- Improved sizing required
You calculate the CPU usage for an MCOD database by adding up the CPU usage for each individual SAP system. You can do the same for memory resources and disk space.
You can size multiple components in one database by sizing each individual component using the `Quick Sizer` tool and then adding the requirements together. For more information about the `Quick Sizer`, see <http://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 MCODE 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.

i Note

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

Constraints

- We **strongly recommend** that you test MCODE in a test or development system. We recommend that you run MCODE systems in the same context. We do not recommend that you mix test, development, and production systems in the same MCODE.
- In the event of database failure, all SAP systems running on the single database are affected.
- Automated support in an MCODE landscape for the following administrative tasks depends on your operating system and database:
 - Copying a single component from an MCODE landscape to another database at database level.
 - Uninstalling a single component from an MCODE 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://support.sap.com/remotecomnection>.
- You **cannot** install a Unicode ABAP system with a non-Unicode ABAP system in one database.
- For the second SAP system, you must use the same `<DBSID>` as for the first SAP system.
- If you install an MCODE system, the `SYSTEM` tablespace must contain at least 400 MB of free space. If there is not enough space left, increase the size of this tablespace with `BRSPACE` or `BRTOOLS`.
- If you decide to turn off archive log mode during the database load phase of the installation, you need to plan downtime for all MCODE systems sharing the database.

7.3 Creating a User for LDAP Directory Access

Use

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

For more information, see *Integration of LDAP Directory Services* in the Windows installation guide for your SAP system solution and database.

Prerequisites

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

Procedure

1. Log on as user `<sapsid>adm`.
2. Enter:
`ldappasswd pf=<Path_and_Name_of_Instance_Profile>`
3. Enter the required data.

Example

The following is an example of an entry to create an *LDAP Directory User*:

```
CN=sapldap,CN=Users,DC=nt5,DC=sap-ag,DC=de
```

7.4 Heterogeneous SAP System Installation

This section provides information on the installation of an SAP system in a heterogeneous system landscape. “Heterogeneous system landscape” means that application servers run on different operating systems.

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

- Supported combinations of operating systems and database systems
- How to install an application server on Windows in a heterogeneous (UNIX) SAP system environment
- Heterogeneous SAP system landscapes with different UNIX operating systems

7.5 Installing Oracle Real Application Clusters

You want to install Oracle Real Application Clusters (RAC) with the Software Provisioning Manager (the "installer") in an SAP environment. This section provides additional information for the RAC installation using the installer.

Prerequisites

Example

This section describes the installation steps of a RAC installation using the following installation parameters:

- `DB_SID=C11`
- `default ASM data diskgroup=+DATA`
- `database hostnames (three node cluster)=vhost1,vhost2,vhost3`
- `three-digit threads=001,002,003` (it is also possible to have `single-digit threads=1,2,3`)

During the installation, the installer executes the Oracle executable `$ORACLE_HOME/bin/srvctl` to create the `<DBSID>` cluster database (`add database`) and adds three instances (`add instance`) on the different hosts. While the database is being loaded, the cluster is disabled (`disable database`).

- When the database installation, database load and also additional steps like `update statistics`, `setting database users` and `creating secure store` have all finished, the installer sets the database to cluster mode (`cluster_database=true`) and enables the cluster database (`enable database`). You can find all these commands in the installer log files `sapinst_dev*.log` in the installation directory (default: `/tmp/sapinst_instdir`):

Example

Oracle 11:

```
/oracle/C11/112/bin/srvctl add database -d C11 -o
/oracle/C11/112 -p +DATA/C11/spfileC11.ora -a DATA
/oracle/C11/112/bin/srvctl add instance -d C11 -i C11001 -n vhost1
/oracle/C11/112/bin/srvctl add instance -d C11 -i C11002 -n vhost2
/oracle/C11/112/bin/srvctl add instance -d C11 -i C11003 -n vhost3
/oracle/C11/112/bin/srvctl disable database -d C11
sqlplus "/" as sysdba"
ALTER SYSTEM SET CLUSTER_DATABASE=true
exit
/oracle/C11/112/bin/srvctl enable database -d C11
```

Oracle 12:


```

/oracle/C11/121/bin/srvctl add database -d C11 -oraclehome
/oracle/C11/121 -p +DATA/C11/spfileC11.ora -role PRIMARY -policy AUTOMATIC -
startoption OPEN -stopoption NORMAL
/oracle/C11/121/bin/srvctl add instance -db C11 -instance C11001 -n vhost1
/oracle/C11/121/bin/srvctl add instance -db C11 -instance C11002 -n vhost2
/oracle/C11/121/bin/srvctl add instance -db C11 -instance C11003 -n vhost3
/oracle/C11/121/bin/srvctl disable database -db C11
sqlplus "/" as sysdba"
ALTER SYSTEM SET CLUSTER_DATABASE=true
exit
/oracle/C11/121/bin/srvctl enable database -db C11



```

- When the database installation has finished and the installer has stopped, you can check the database status as oracle user or <sapsid>adm user with the following command:

Oracle 11: `srvctl status database -d C11`

Oracle 12: `srvctl status database -db C11`

Context

For additional information about how set up SAP systems to use Oracle Real Application Clusters (RACs), see the whitepapers at <http://scn.sap.com/community/oracle>  [SAP on Oracle Real Application Clusters \(RAC\)](#) 

These whitepapers describe all required changes to the Oracle database, Oracle network configuration, Oracle instance parameters, and so. However, they do not contain information about RAC installation with installer.

Procedure

1. You can then start the database on all nodes with the following command:

Oracle 11: `srvctl start database -d C11`

Oracle 12: `srvctl start database -db C11`

The installer does not start the database on all nodes after the installation has finished. Only the first database RAC node is started.

You need to start all other instances manually after completing the preparation on the other database nodes. In addition, when the installation is finished, the <sapsid>adm environment variable ORACLE_SID is set to C11001 on the first node.

2. You prepare all other database instances as described in the following:

After completing the installation of the first RAC database node, you need to prepare all other database nodes with the installer. These installation preparation steps create the required operating system users and groups and also install the required kernel files like `dba*tools` and SAP Host Agent.

You can find this option on the *Welcome* screen of the installer at: ► [Generic Installation Option](#) ► [Oracle](#) ► [Database tools](#) ► [RAC/ASM/Exadata Database Instance Preparation - Kernel <Version>](#) ►

3. You install the primary application server instance and the additional application server instances:

For the RAC installation, the installer performs some additional steps during the installation of the additional application server instance so that the additional application server instance can connect to the cluster nodes. For this the installer updates the `tnsnames.ora` file with some additional RAC-specific entries.

The installer modifies `tnsnames.ora` like in the following example:

```
C11.WORLD
C11001.WORLD, C11002.WORLD, C11003.WORLD
C11_D01.WORLD
C11_D02.WORLD
```

The installer modifies SAP instance or start profiles like in the following example, where `<xx>` is a free sequence number in the instance profile or start profile:

```
SETENV_XX = dbs_ora_tnsname=C11_D01
SETENV_XX = dbs_ora_tnsname=C11_D02
```

During the installation of the additional application server instance, the installer tries to restart the instance but this fails because the RAC services are not registered at the cluster ware. To register the RAC services, the installer creates the required commands in a shell script in the local installation directory.

You need to execute these shell scripts on one node of the cluster database as follows:

1. Log on to the database server as the `oracle` user.
2. Set the Oracle environment to the home directory of the RDBMS using the following command: `setenv ORACLE_HOME /oracle/C11/112`
3. Run the shell script using the following command: `call <Path_Of_Shell_Script>/C11_D01.sh`

Example

Oracle 11:

Entries of the shell script:

```
srvctl add service -d C11 -s C11_D01 -r C11001 -a C11002,C11003 -P BASIC -y
AUTOMATIC -q true -j long -e SELECT -m BASIC -z 3 -w 5
```

```
srvctl start service -d C11 -s C11_D01
```

Entries of shell script for the additional application server instance server `C11_D02.sh`:

```
srvctl add service -d C11 -s C11_D02 -r C11002 -a C11001,C11003 -P BASIC -y
AUTOMATIC -q true -j long -e SELECT -m BASIC -z 3 -w 5
```

```
srvctl start service -d C11 -s C11_D02
```

Oracle 12:

Entries of the shell script:

```
srvctl add service -db C11 -service C11_D01 -preferred C11001 -available  
C11002,C11003 -tafpolicy BASIC -policy AUTOMATIC -notification true -failovertime  
SELECT -failovermethod BASIC -failoverretry 3 -failoverdelay 5  
srvctl start service -db C11 -service C11_D01
```

Entries of shell script for the additional application server instance server C11_D02.sh:

```
srvctl add service -db C11 -service C11_D02 -preferred C11002 -available  
C11001,C11003 -tafpolicy BASIC -policy AUTOMATIC -notification true -  
faileovertime SELECT -faileovermethod BASIC -faileoverretry 3 -failoverdelay 5  
  
srvctl start service -db C11 -service C11_D02
```

After you have executed these commands on the database server, the installation of the additional application server instance can continue. Now you can start the instance without connection problems.

4. You start the additional application server instance.

7.6 Database Instance Installation on Oracle Automatic Storage Management

This section provides information on the installation of a database instance on an Oracle Automatic Storage Management (ASM).

Software provisioning manager performs the following steps that differ from the general installation on non-ASM systems:

- It creates the `oracle` user and the additional Oracle groups `oinstall`, `asmdba`, `asmadmin`, and `asmoper`.
- It installs the correct user environment for the `oracle` and `<sapsid>adm` users.

Prerequisites

- You must have installed the Oracle GRID software. This software ensures that ASM can be used.
- You must have created the following Oracle disk groups:
 - `+DATA`, `+<DBNAME>_DATA` or `+DATA_<DB_MACHINE_NAME>` for all data files, online redo logs (first copy), and control file (first copy).
 - `+ARCH`, `+<DBNAME>_ARCH` for control file (second copy) and archive redo logs (not for engineered systems such as Exadata or SuperCluster).
 - `+RECO`, `+<DBNAME>_RECO` or `+RECO_<DB_MACHINE_NAME>` for control file (third copy), online redo log (second copy), RMAN backups and fast recovery area.

More Information

For more information, see SAP Note [1550133](#) and *SAP on Oracle Automatic Storage Management (ASM)* (<http://scn.sap.com/docs/DOC-7971>).

Related Information

[Creating Operating System Users and Groups \[page 70\]](#)

[Oracle Directories \[page 80\]](#)

[Installation Checklist \[page 98\]](#)

[Ensuring User Security \[page 155\]](#)

7.7 Oracle Database 12c Multitenant Database Installation

The multitenant option introduced in Oracle Database 12c allows a single container database (CDB) to host multiple separate pluggable databases (PDB). Using Software Provisioning Manager (the “installer”) you can create a CDB, PDB, and also a new pluggable database in an existing container database.

Container Database (CDB)

The container database is the body of a seed and a pluggable (PDB) database and is called `CDB$ROOT`. In this special database the common user, SGA, control file, and more are stored. Every CDB has a “seed” database. This “seed” is the template for creating additional PDBs. The seed database has the internal name `PDB$SEED`.

Pluggable Database (PDB)

The pluggable database includes the customer data, for SAP the `SAP<SCHEMAID>` data. Every PDB shares the SGA, control file, redo logs and undo tablespace from the CDB. Every PDB has its own system and `sysaux` tablespace and can have its own temporary tablespace.

Installation Features in the Installer

The installation has the following restrictions:

- This installation is only available for `SWPM 7.*` where * is greater than 1.

- This installation is only available for single instance installation on file system.
- SAP kernel version must be 7.45 or higher.

The installation is possible for the following scenarios:

- Install the CDB and PDB.
- Install one or more PDBs in an existing CDB.

For more information, see [2336881](#) 

Related Information

[Installing the Container Database and a Pluggable Database \[page 183\]](#)

[Installing a Distributed Application Server Instance \[page 184\]](#)

[Installing an Additional Pluggable Database in a Pre-Installed Container Database \[page 184\]](#)

7.7.1 Installing the Container Database and a Pluggable Database

In this section it is described how you install the container database (CDB) and a pluggable database (PDB).

Procedure

1. Start the installer on the database instance host to perform the database instance installation as described in [Running the Installer \[page 110\]](#).
2. On the *SAP System Database* screen, you have to specify the container database (CDB) system id (SID) in the field *Database ID*. The SID cannot have the same SID as the PDB.

➔ Recommendation

We recommend that you assign the CDB a different SID than the SAP system ID (<SAPSID>) because the default SID of the pluggable database (PDB) equals the <SAPSID>.

3. On the *Oracle Multitenant Database* screen, you select the PDB SID (default is SAP SID). CDB SID cannot have the same SID as PDB SID. When you select No, a normal database installation is done.

Related Information

[Oracle Database 12c Multitenant Database Installation \[page 182\]](#)

[SAP System Database Parameters \[page 57\]](#)

7.7.2 Installing a Distributed Application Server Instance

For a distributed application server installation, you need to specify how the application server is to connect to a pluggable database (PDB) or a “normal” database. You can install one or more additional PDBs in an existing container database (CDB).

Procedure

1. Start the installer on the application server instance host as described in [Running the Installer \[page 110\]](#).
2. On the *SAP System Database* screen, enter the CDB SID of your existing CDB where your pluggable database is located.
3. On the *Oracle Multitenant Database* screen, you select the PDB SID where you want to install the application server instances.

Related Information

[Oracle Database 12c Multitenant Database Installation \[page 182\]](#)

[SAP System Database Parameters \[page 57\]](#)

7.7.3 Installing an Additional Pluggable Database in a Pre-Installed Container Database

This section describes how you install an additional pluggable database (PDB) in a Pre-Installed container database (CDB).

Procedure

1. Start the installer on the database instance host to perform the database instance installation as described in [Running the Installer \[page 110\]](#).
2. On the *SAP System Database* screen, enter the container database system ID (CDB SID) of an existing container database installation.
The installer recognizes that a normal database installation or a pre-installed CDB already exists.
3. If you want to install an additional PDB, on the Oracle Database screen enter Install Additional Pluggable DB in Existing Container DB.
4. On the *Oracle Multitenant Database* screen, the installer displays all available PDBs. Select *Install or Connect to Multitenant PDB* and specify the SID of PDB (PDBSID)

Related Information

[Oracle Database 12c Multitenant Database Installation \[page 182\]](#)

[SAP System Database Parameters \[page 57\]](#)

7.8 Installing the SAP Host Agent Separately

This procedure tells you how to install an SAP Host Agent **separately**.

Context

The SAP Host Agent is installed automatically during the installation of new SAP instances with SAP kernel 7.20 or higher (integrated installation). This procedure is only for hosts with no SAP Host Agent running on them, due to the following reasons:

- There is no SAP system or instance on the host.
- The SAP system or instance running on the host has a kernel release lower than SAP kernel 7.20 and the host does not yet have an SAP Host Agent.
- You have upgraded your SAP system to a release with a kernel release lower than SAP kernel 7.20 and the host of the upgraded system or instance does not yet have an SAP Host Agent.

SAP Host Agent has the following executable programs and services:

- The `SAPHostExec` service
- The `sapstartsrv` service `SAPHostControl`
- The operating system collector `saposcol`

i Note

The installed programs are automatically started when the host is booted.

The automatic start is ensured by the startup script `sapinit`, which starts the required executables.

For more information about the SAP Host Agent, see the following documentation:

Table 67:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">• SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71• SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711	<p>▶ Application Help ▶ Function-Oriented View ▶ Application Server Infrastructure ▶ SAP Host Agent ▶</p>

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> • SAP NetWeaver 7.1 for Banking Services from SAP http://help.sap.com/nwmobile71 • SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP http://help.sap.com/nwmobile711 	<p>See the SAP NetWeaver Mobile Library.</p> <div style="background-color: #fff9c4; padding: 10px;"> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</p> </div>
<ul style="list-style-type: none"> • SAP NetWeaver 7.3 http://help.sap.com/nw73 • SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 • SAP NetWeaver 7.4 http://help.sap.com/nw74 • SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ Application Help ▶ Function-Oriented View: English ▶ Solution Life Cycle Management ▶ SAP Host Agent ▶</p>

The following procedure describes the steps you have to perform on the host where you install the SAP Host Agent separately.

Procedure

1. Check the hardware and software requirements on the installation host.

The minimum requirements are as follows:

- Hard Disk Space: 1 GB
- RAM: 0.5 GB
- Swap Space: 2 x RAM

For more information, see [hardware and software requirements \[page 32\]](#).

2. Make sure that the `sapadm` user is created.

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

Table 68: User and Groups of the SAP Host Agent

User	Primary Group	Additional Group	Comment
sapadm	sapsys	-	<p>SAP Host Agent administrator</p> <p>i Note</p> <p>If <code>sapadm</code> does not exist, it is created during the SAP Host Agent installation using <code>/bin/false</code> shell.</p> <p>Make sure that <code>/bin/false</code> can be used as a login shell.</p> <p>Only valid for 'Platform': AIX</p> <p>Add <code>/bin/false</code> to the list of valid login shells (attribute <code>shells</code>) in <code>/etc/security/login.cfg</code>.</p> <p>End of 'Platform': AIX</p>

Table 69: Groups and Members of the SAP Host Agent User

Groups	Members
sapsys	sapadm
sapinst	sapadm

3. Set up the required file system for the SAP Host Agent:
















Table 70:

Directories	Description	Required Disk Space
<code>/usr/sap/hostctrl</code>	<p>Contains the following directories:</p> <ul style="list-style-type: none"> o <code>exe</code> Contains the profile <code>host_profile</code> o <code>work</code> Working directory of the SAP Host Agent 	100 MB

For more information, see [Setting up file systems and raw devices \[page 74\]](#)

4. Download and unpack the Software Provisioning Manager 1.0 archive on the host where you want to install the SAP Host Agent as described in [Downloading the Software Provisioning Manager Archive \[page 90\]](#).
5. Make the latest patch level of the `SAPHOSTAGENT <Version>.SAR` file available on the host where you want to install the SAP Host Agent as described in [Downloading the Software Provisioning Manager Archive \[page 90\]](#).

You can do this in the following ways:

- Download it from the following path: <http://support.sap.com/swdc>   [Software Downloads](#)  [SUPPORT PACKAGES & PATCHES](#)  [By Category](#)  [SAP Technology Components](#)  [SAP HOST AGENT](#)  [SAP HOST AGENT 7.21](#)  [<Operating System>](#) 
 - Alternatively, you can also copy it from the UC kernel medium (folder `K_<Version>_U_<OS>`), where “_U_” means Unicode.
You can either use the physical UC kernel medium from the installation package of your SAP system, or download the kernel medium from <https://support.sap.com/swdc>  (see [Downloading the Complete Installation Media \[page 96\]](#))
6. To install the SAP Host Agent, you [start the installer \[page 110\]](#) and choose  [Generic Installation Options](#)  [<Database>](#)  [Preparations](#)  [SAP Host Agent](#)  on the *Welcome* screen of the installer.
7. Check whether the installed services are available:
- a. Log on as user `sapadm`.

Note

When the host is booted, the startup script `sapinit` automatically starts the required executables.

- b. Check whether the following services are available:
 - The control program `saphostexec`
 - The SAP NetWeaver Management agent `SAPHostControl` (`sapstartsrv` in host mode)

7.8.1 Downloading the Software Provisioning Manager Archive









You always have to download and unpack the Software Provisioning Manager 1.0 archive (`SWPM10SP<Support_Package_Number>_<Version_Number>.SAR`) from the SAP Software Download Center because you must use the latest version.

Prerequisites

Make sure the latest version of the `SAPCAR` archiving tool is available on each installation host.

You require the `SAPCAR` archiving tool to be able to unpack software component archives (*.SAR files), which is the format of software lifecycle media and tools that you can download from the SAP Software Download Center.

If required, you can download the latest version of `SAPCAR` from:

<http://support.sap.com/swdc>   [Support Packages and Patches](#)  [Software Downloads](#)  [SUPPORT PACKAGES & PATCHES](#)  [By Alphabetical Index \(A-Z\)](#)  [S](#)  [SAPCAR](#) 

For more information about `SAPCAR`, see SAP Note [212876](#) .

Procedure

1. Download the latest version of the Software Provisioning Manager 1.0 archive SWPM10SP<Support_Package_Number>_<Version_Number>.SAR from:

<http://support.sap.com/swdc> > Support Packages and Patches > Software Downloads > SUPPORT PACKAGES & PATCHES > By Alphabetical Index (A-Z) > S > SOFTWARE PROVISIONING MANAGER >

Note

If you have an operating system version that has been initially released with SAP kernel 7.2<x> but is no longer supported for SAP kernel 7.40 and higher, instead of the SWPM* .SAR archive you must download the RMOSSWPM* .SAR archive for these outdated operating system versions. For more information, see [Constraints \[page 8\]](#)

2. Unpack the Software Provisioning Manager archive to a local directory using the following command:

```
SAPCAR -xvf <Path_To_Download_Directory>/<Archive>.SAR -R <Unpack_Directory>
```

Note

Make sure that all users have read permissions for the directory where you want to unpack the installer.

Caution

Make sure that you unpack the Software Provisioning Manager archive to a dedicated folder. Do not unpack it to the same folder as other installation media.

7.9 Splitting Off an ABAP Central Services Instance from an Existing Primary Application Server Instance

Prerequisites

The existing SAP system of the primary application server instance must meet the following requirements:

- It was upgraded to an SAP system based on SAP NetWeaver 7.1 or higher
- It does not yet have an ASCS instance

Context

With the installation option *Split Off ASCS Instance from existing Primary Application Server Instance*, you can move the message server and the enqueue work process from an existing primary application server instance to a newly installed ABAP central services instance (ASCS instance). The new ASCS instance is installed while the split is done.

Before the Split

The primary application server instance includes:

- ABAP dispatcher and work processes (dialog, batch, spool, enqueue, or update)
- Gateway
- Internet communication manager (ICM)
- Internet graphics service (IGS)
- ABAP message server

After the Split

An ABAP central services instance (ASCS instance) has been split off from the existing primary application server instance.

The primary application server instance now includes:

- ABAP dispatcher and work processes (dialog, batch, spool, or update)
- Gateway
- Internet communication manager (ICM)
- Internet graphics service (IGS)

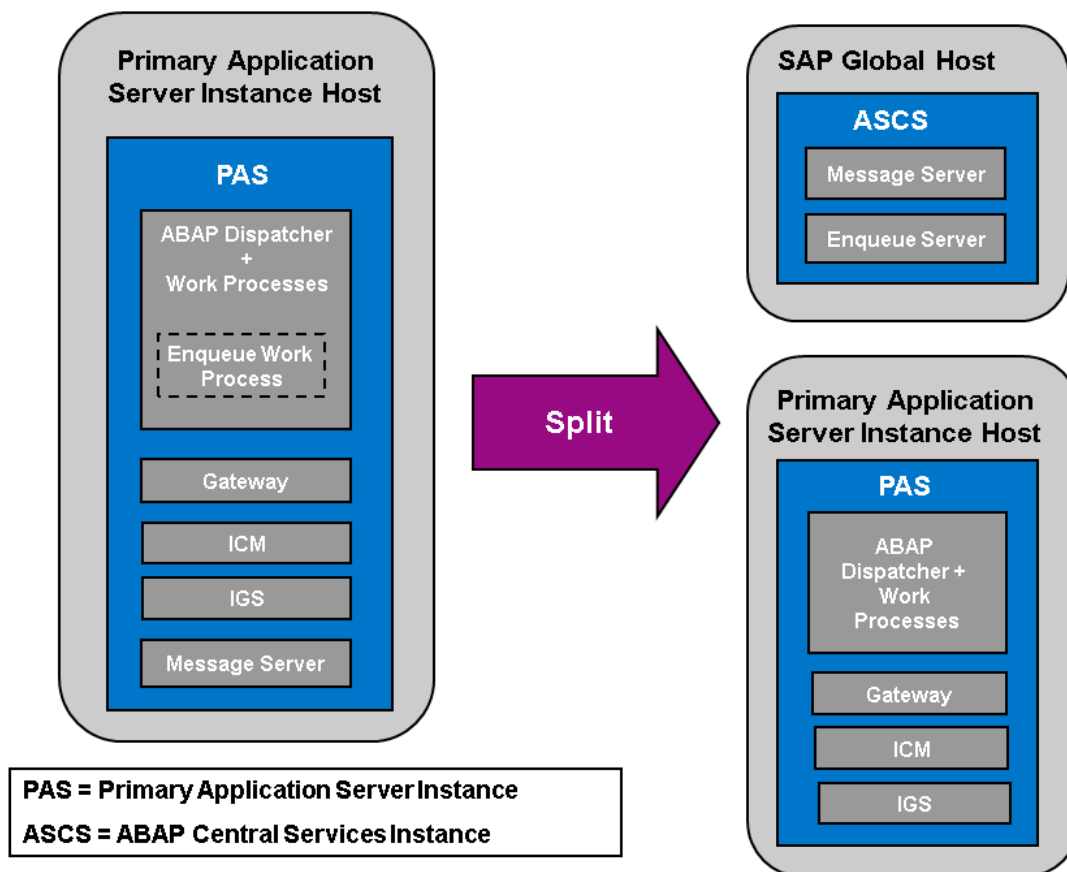
The newly created ABAP central services instance (ASCS instance) includes:

- ABAP message server
- ABAP standalone enqueue server

The ABAP enqueue work process is now replaced with the ABAP standalone enqueue server.

The Effect of the Split

The following graphic provides an overview of the components contained in the primary application server instance before and after the split, along with the newly created ASCS instance:



Procedure

1. Plan the basic parameters, as described in [SAP System Parameters \[page 48\]](#):
 - Choose an instance number for the ASCS instance to be created.
 - Note that the message server port is not changed during the split.
2. Check the hardware and software requirements for the ASCS instance to be created as described in [Hardware and Software Requirements \[page 32\]](#).
3. Specify basic [SAP System Parameters \[page 48\]](#) for the ASCS instance to be created.
4. [Set up the required file systems \[page 74\]](#) for the ASCS instance to be created.
5. Check the [prerequisites \[page 108\]](#) and [start the installer \[page 110\]](#) on the host where the ASCS instance is to be created.
6. On the *Welcome* screen, choose **>> <Product> > <Database> > Additional SAP System Instances > Split Off ASCS Instance from Existing Primary Application Server Instance >**.

7. Follow the instructions on the installer screens and enter the required parameters.

i Note

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

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

8. To start the installation, choose *Start*.

The installer starts the installation and displays the progress of the installation. When the installation has successfully completed, the installer shows the dialog *Execution of Split Off ASCS Instance from existing Primary Application Server Instance has completed*.

9. You check and if necessary modify the settings for the operating system users for your SAP system if they were created by the installer.

For more information, see [Creating Operating System Users and Groups \[page 70\]](#).

10. [Restart the application server instances \[page 192\]](#) (primary application server instance and additional application server instances if they exist).
11. Check whether you can [log on to the application servers \[page 139\]](#).
12. [Ensure user security \[page 155\]](#) for the operating system users of the newly created ASCS instance.
13. If required, [perform an installation backup \[page 163\]](#).

7.10 Starting and Stopping SAP System Instances

Start or stop SAP system instances in one of the following ways:

- [Using the SAP Management Console \(SAP MC\) \[page 192\]](#)
- [Using commands \[page 196\]](#).

7.10.1 Starting and Stopping SAP System Instances Using the SAP Management Console

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

Prerequisites

- Make sure that the host names defined in the DNS server match the names of the SAP system instance hosts. In particular, keep in mind that host names are case-sensitive. For example, if the names of the SAP system instance hosts are in upper case, but the same host names are defined in the DNS server in lower case, starting and stopping the system does not work.

- If you want to start or restart remote systems or instances, make sure that you have registered them in the SAP Management Console (SAP MC). You do not need to register SAP systems or instances installed on the local host, because the SAP MC displays them automatically.
- The SAP Host Agent is installed on the host where the application server of the SAP system or instance runs.
- You have installed Java Runtime Environment (JRE) 5.0 or higher.
- Your Web browser supports Java.
- Your Web browser's Java plug-in is installed and enabled to run scripting of Java applets.

Context

➔ Recommendation

If you experience any issues when starting or using the SAP MC, refer to SAP Note [1153713](#).

- For more information about handling the SAP MC, see the following documentation:

Table 71:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver Mobile 7.1 http://help.sap.com/nwmobile71 ○ SAP NetWeaver Mobile 7.1 including Enhancement Package 1 http://help.sap.com/nwmobile711 	<ul style="list-style-type: none"> ▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>SAP Management Console</i> ▶
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.3 http://help.sap.com/nw73 ○ SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<ul style="list-style-type: none"> ▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Solution Life Cycle Management</i> ▶ <i>SAP Management Console</i> ▶

- If your newly installed SAP system is part of a heterogeneous SAP system landscape comprising systems or instances on Windows platforms, you can also start and stop it from a Windows system or instance using the **SAP Microsoft Management Console (SAP MMC)**.

For more information about handling the SAP MMC, see the following documentation:


Table 72:

Release SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none"> ○ SAP NetWeaver Mobile 7.1 ○ SAP NetWeaver Mobile 7.1 including Enhancement Package 1 ○ SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0 ○ SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0 	See the SAP Library path for SAP NetWeaver 7.3 and higher.
<ul style="list-style-type: none"> ○ SAP NetWeaver 7.3 http://help.sap.com/nw73 ○ SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731 ○ SAP NetWeaver 7.4 http://help.sap.com/nw74 ○ SAP NetWeaver 7.5 http://help.sap.com/nw75 	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View: English</i> ▶ <i>Solution Life Cycle Management</i> ▶ <i>SAP Microsoft Management Console: Windows</i> ▶</p>

Procedure

- **Starting the Web-Based SAP Management Console**


1. Start a Web browser and enter the following URL:
http://<Host_Name>: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 (SAP MC) appears.
 By default, the instances installed on the host you have connected to are already added in the SAP MC.

i Note

If the instances have not been added or if you want to change the configuration to display systems and instances on other hosts, you have to register your system manually. This is described in *Registering Systems and Instances in the SAP Management Console* below.

• **Starting SAP Systems or Instances**

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

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 choose *Start* from the context menu.
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.

i Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user `<sapsid>adm`.

Starting SAP System Instances Successively

If you need to start the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Start the database instance.
2. Start the ABAP central services instance `ASCS<Instance_Number>`.
3. Start the primary application server instance `D[VEBMGS] <Instance_Number>`.

i Note

In SAP systems based on SAP NetWeaver 7.5 or higher, the primary application server instance is named `D<Instance_Number>`.

In SAP systems based on SAP NetWeaver 7.4 or lower, the primary application server instance is named `DVEBMGS<Instance_Number>`.

4. Start additional application server instances `D<Instance_Number>`, if there are any.

• **Stopping SAP Systems or Instances**

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

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.

i Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user `<sapsid>adm.`

Stopping SAP System Instances Successively

If you need to stop the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Stop additional application server instances `D<Instance_Number>`, if there are any.
2. Stop the primary application server instance `D[VEBMGS]<Instance_Number>`.

i Note

In SAP systems based on SAP NetWeaver 7.5 or higher, the primary application server instance is named `D<Instance_Number>`.

In SAP systems based on SAP NetWeaver 7.4 or lower, the primary application server instance is named `DVEBMGS<Instance_Number>`.

3. Stop the ABAP central services instance `ASCS<Instance_Number>`.
4. Stop the database instance.

7.10.2 Starting and Stopping SAP System Instances Using Commands

Prerequisites

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

Context

i Note

The `startsap` and `stopsap` commands are deprecated. SAP recommends that you do not use them any longer. For more information, see SAP Notes [1763593](#) and [809477](#).

This section only lists the basic commands how to start or stop an SAP system. You can find a detailed list of all `SAPControl` options and features in the command line help, which you can call as follows:

Table 73:

UNIX:	<code>/usr/sap/hostctrl/exe/sapcontrol --help</code>
Windows:	<code>%ProgramFiles%\SAP\hostctrl\exe\sapcontrol.exe --help</code>

Procedure

- **Starting an SAP System or Instance**

- Starting an SAP System:

You can start an SAP system by executing the following commands from the command line

(<Instance_Number> can be the number of any instance of the SAP system):

Table 74:

UNIX	<pre>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -function StartSystem</pre>
Windows	<pre>%ProgramFiles%\SAP\hostctrl\exe \sapcontrol.exe -nr <instance_number> -function StartSystem</pre>

- Starting an SAP System Instance

You can start an SAP system instance by executing the following commands from the command line:

Table 75:

UNIX	<pre>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> - function Start</pre>
Windows	<pre>%ProgramFiles%\SAP\hostctrl\exe\sapcontrol.exe -nr <instance_number> -function Start</pre>

For remote instances, the syntax is slightly different, because you also have to apply the **-host** and **-user** parameters:

Table 76:

UNIX	<pre>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function Start</pre>
Windows	<pre>%ProgramFiles%\SAP\hostctrl\exe\sapcontrol.exe -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function Start</pre>

- **Stopping an SAP System or Instance**

- Stopping an SAP System

You can stop an SAP system by executing the following commands from the command line (<Instance_Number> can be the number of any instance of the SAP system):

Table 77:

UNIX	<code>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -function StopSystem</code>
Windows	<code>%ProgramFiles%\Program Files\SAP\hostctrl\exe\sapcontrol.exe -nr <instance_number> -function StopSystem</code>

- o Stopping an SAP System Instance

You can stop an SAP system instance by executing the following commands from the command line:

Table 78:

UNIX	<code>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -function Stop</code>
Windows	<code>%ProgramFiles%\SAP\hostctrl\exe\sapcontrol.exe -nr <instance_number> -function Stop</code>

For remote instances, the syntax is slightly different, because you also have to apply the `-host` and `-user` parameters:

Table 79:

UNIX	<code>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function Stop</code>
Windows	<code>%ProgramFiles%:\Program Files\SAP\hostctrl\exe\sapcontrol.exe -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function Stop</code>

i Note

The database is not stopped by these commands. You have to stop the database using database-specific tools or commands.

- **Checking System Instance and Processes**

- o With the following command you get a list of system instances, their status, and the ports used by them (<Instance_Number> can be the number of any instance of the SAP system):

Table 80:

UNIX	<code>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function GetSystemInstanceList</code>
------	--

Windows	<pre>%ProgramFiles%\SAP\hostctrl\exe\sapcontrol.exe -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function GetSystemInstanceList</pre>
---------	--

- With the following command you get a list of instance processes and their status:

Table 81:

UNIX	<pre>/usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function GetProcessList</pre>
Windows	<pre>%ProgramFiles%\SAP\hostctrl\exe\sapcontrol.exe -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function GetProcessList</pre>

- **Troubleshooting**

If you get an error like "FAIL: NIECONN_REFUSED", execute `sapcontrol -nr <Instance_Number> -function StartService <SAPSID>` to ensure that `sapstartsrv` is running. Then execute again the start or stop command.

7.11 Deleting an SAP System or Single Instances

This section describes how to delete a complete SAP system or single SAP instances with the *Uninstall* option of the installer.

Prerequisites

- You have installed your SAP system with standard SAP tools according to the installation documentation.
- You are logged on as a user with `root` permissions.

Caution

Do **not** use the `<sapsid>adm` user to delete the SAP system.

- Make sure that the SAP system, or single instance, or standalone engine, or optional standalone unit to be deleted is down and that you are not logged on as one of the SAP system users. Also check that all SAP-related processes are stopped. If there is a lock on one of the SAP system objects, the uninstall fails.

Note

You do not have to stop the SAP Host Agent. The SAP Host Agent is stopped automatically during the uninstall process.

- When starting the uninstall, make sure that there are no SAP system user sessions still open.

Context

i Note

With this installer option you do **not** delete the database software.

Note the following when deleting an SAP system or single instances:

- We strongly recommend that you delete an SAP system or single instances using the installer. However, you can also delete an SAP system or single instance manually. For more information, see SAP Note [1259982](#).
- 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.
- During the uninstall process, all file systems and subdirectories of the selected SAP system or single instance are deleted. Before you start uninstalling, check that you have saved a copy of all files and directories that you want to keep to a secure location.
- The uninstall process is designed to remove as much as possible of the SAP system to be deleted. If an item cannot be removed, a message informs you that you have to remove this item manually. You can do this either at once or after the uninstall process has finished. As soon as you confirm the message, the uninstall process continues.

Procedure

1. Start the installer as described in [Running the Installer \[page 110\]](#).
2. On the *Welcome* screen, choose:

► *Generic Installation Options* ► *<Database>* ► *Uninstall* ► *Uninstall SAP Systems or Single Instances* ►

3. Follow the instructions on the installer screens to delete a complete SAP system or single instances.

i Note

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

The following table provides information about deleting a complete system or single instances with the installer.

Table 82:

Deletion of	Remarks
Standard system	You can delete a standard system (where all instances reside on the same host) in one installer run.
Distributed or high-availability system	<p>If you want to delete a distributed or high-availability system, you have to run the installer to delete the required instances locally on each of the hosts belonging to the SAP system in the following sequence:</p> <ol style="list-style-type: none"> 1. Additional application server instances, if there are any <div style="background-color: #fff9c4; padding: 10px;"> <p>⚠ Caution</p> <p>Do not select checkbox <i>Uninstall all instances of the SAP system from this host</i> if you do not want to uninstall the complete SAP system or standalone engine. For example, do not select this checkbox if you only want to uninstall an additional application server instance of an existing SAP system distributed over several hosts. Otherwise the contents of mounted global directories under <code>/<sapmnt>/<SAPSID>/</code>, such as instance profiles and kernel executables, are also deleted.</p> </div> <ol style="list-style-type: none"> 2. Primary application server instance 3. Database instance <p>Choose whether you want to drop the entire database instance or only one or more database schemas.</p> <p>Since the installer only stops local instances automatically, make sure that before deleting the database instance of a distributed system, you stop all remaining instances. You must stop the instance with the message server only after having entered all installer parameters for the deletion of the database instance.</p> <p>Before deleting any database schema, make sure that:</p> <ul style="list-style-type: none"> ○ You have performed a recent offline database backup. ○ You have stopped or deleted all SAP instances belonging to this database schema. ○ You only delete the tablespaces that belong to the selected schema. <p>The database tablespace <code>PSAP<SCHEMA_ID>DB</code> belongs by default to the Java schema <code>SAP<SCHEMA_ID>DB</code>. All other SAP tablespaces belong to the ABAP schema <code>SAP<SCHEMA_ID></code> (or <code>SAPR3</code> for older SAP systems).</p> 4. ABAP Central services instance (ASCS) <div style="background-color: #fff9c4; padding: 10px;"> <p>i Note</p> <p>To delete system directories mounted from an NFS server, you have to run the installer on the NFS server.</p> </div>
Additional application server	If you want to delete additional application server instances of an existing SAP system, you have to run the installer to delete them locally on each additional application server instance host.

Deletion of	Remarks
Standalone SAP Host Agent	<p>The SAP Host Agent is automatically uninstalled from a host together with the last remaining SAP system instance.</p> <p>If you want to uninstall a standalone SAP Host Agent, deselect <i>Profiles Available</i> and select <i>Uninstall Standalone SAP Host Agent</i> on the <i>General SAP System Parameters</i> screen.</p>

4. When you have finished, delete the relevant directory structure on the global host.
5. Uninstall the Oracle database software with the Oracle Universal Installer (OUI).
For more information, see [Oracle Database Software Uninstallation \[page 202\]](#).
6. If you created the directories `/usr/sap/<SAPSID>` and `/<sapmnt>/<SAPSID>` as mount points, but not as directories on the local file system, you have to remove them manually.
7. To remove obsolete SLD data, see the following document: <http://scn.sap.com/docs/DOC-8516> ►► [How-to Manage House-Cleaning in the System Landscape Directory - Duplicate System Entries](#) ►

7.12 Oracle Database Software Uninstallation

You have to uninstall the Oracle database software to complete the uninstallation of the Oracle database instance.

Related Information

[Uninstalling the Oracle 11 Database Software \[page 202\]](#)

[Uninstalling the Oracle 12 Database Software \[page 203\]](#)

7.12.1 Uninstalling the Oracle 11 Database Software

This procedure tells you how to uninstall the database software, starting with Oracle Database 11g Release 2 (11.2).

Context

For more information, see SAP Note [1525025](#) ►.

Caution

Do **not** use RunInstaller or the new deinstall tool to remove an Oracle 11.2 database installation. The deinstall tool might not only delete the software from the Oracle home, but also other files (database files, logs, traces, configuration files, inventory) in `<ORACLE_BASE>`.

Therefore, we strongly recommend you to use the procedure below to remove the 11.2 Oracle home software.

Procedure

1. Back up the central Oracle inventory, which is normally located at `$ORACLE_BASE`:

```
OS> cd $ORACLE_BASE
```

```
OS> zip -r oraInventory.zip oraInventory
```

2. Check whether Oracle home is registered in the central Oracle inventory:

```
OS> $ORACLE_HOME/OPatch/opatch lsinventory -all -invPtrLoc $ORACLE_HOME/oraInst.loc
```

If Oracle home is registered, it appears in the displayed `List of Oracle Homes`. Otherwise, `opatch` returns error code 73.

Oracle home must be registered in order to detach it.

3. Detach Oracle home from the central Oracle inventory:

```
OS> $ORACLE_HOME/oui/bin/runInstaller -silent -detachHome ORACLE_HOME=$ORACLE_HOME -  
waitForCompletion -invPtrLoc $ORACLE_HOME/oraInst.loc
```

At the end of the procedure, you see the message:

```
'DetachHome' was successful
```

4. Remove the Oracle home software from the file system:

```
OS> rm -rf $ORACLE_HOME
```

7.12.2 Uninstalling the Oracle 12 Database Software

Procedure

Proceed as described in SAP Note [1915314](#).

A Appendix

A.1 Online Information from SAP

More information is available online as follows:

Only valid for 'Software Component': SAP NetWeaver

Table 83: Documentation

Description	Internet Address	Title
Installation of Multiple Components in One Database (MCOD) and its availability on different platforms	http://scn.sap.com/docs/DOC-8559	<i>Multiple Components in One Database (MCOD)</i>
SAP Front End installation Guide	http://scn.sap.com/docs/DOC-25456	<i>SAP Front End Installation Guide – <Current Release></i>
Software Provisioning Manager 1.0 SP <No> Guides	http://help.sap.com/sltoolset ▶ <i>System Provisioning</i> ▶	<i>Software Provisioning Manager 1.0 SP <No> Install, copy, transform, split, rename, and uninstall products based on SAP NetWeaver AS ABAP and AS Java</i>



End of 'Software Component': SAP NetWeaver

Table 84: SAP Library Quick Links

Product and Release	Internet Address
SAP NetWeaver Mobile 7.1	http://help.sap.com/nwmobile71
SAP NetWeaver Mobile 7.1 including Enhancement Package 1	http://help.sap.com/nwmobile711
SAP NetWeaver 7.1 (including Enhancement Package 1) for Banking Services from SAP 5.0 and 6.0	See the SAP NetWeaver Mobile 7.1 (including Enhancement Package 1) Library quicklink <div style="background-color: #fff9c4; padding: 10px;"> <p>i Note</p> <p>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 (including Enhancement Package 1) for Banking Services from SAP 5.0 and 6.0.</p> </div>

Product and Release	Internet Address
SAP systems based on SAP NetWeaver 7.3:	http://help.sap.com/nw73
SAP systems based on SAP NetWeaver 7.3 including Enhancement Package 1	http://help.sap.com/nw731
SAP systems based on SAP NetWeaver Application Server for ABAP 7.4	http://help.sap.com/soh
SAP systems based on SAP NetWeaver 7.4	http://help.sap.com/nw74
SAP systems based on SAP NetWeaver 7.5	http://help.sap.com/nw75

Table 85: General Quick Links

Description	Internet Address
SAP Help Portal	http://help.sap.com
SAP NetWeaver Library in SAP Help Portal	http://help.sap.com/netweaver
SAP ERP Library in SAP Help Portal	http://help.sap.com/erp
SAP CRM Library in SAP Help Portal	http://help.sap.com/crm
SAP SRM Library in SAP Help Portal	http://help.sap.com/srm
SAP SCM Library in SAP Help Portal	http://help.sap.com/scm
SL Toolset	http://help.sap.com/sltoolset
Software logistics in application lifecycle management	http://scn.sap.com/community/it-management/alm/software-logistics
SAP Notes	https://support.sap.com/notes
Supported platforms and operating systems	http://scn.sap.com/community/database  Related Resources 
Product availability matrix (PAM)	http://support.sap.com/pam
System sizing (Quick sizer tool)	http://sap.com/sizing
SAP NetWeaver capabilities	http://scn.sap.com/community/netweaver
Application lifecycle management for SAP NetWeaver	http://scn.sap.com/community/it-management/alm
Information on SAP support package stacks	http://support.sap.com/sp-stacks

Description	Internet Address
SAP Solution Manager	http://support.sap.com/solutionmanager

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**go.sap.com/registration/
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