



Installation Guide | PUBLIC

Software Provisioning Manager 1.0 SP38

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Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.5 and SAP Solution Manager 7.2 SR2 Java of SAP NetWeaver 7.5 on UNIX: SAP Adaptive Server Enterprise

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Document History

i Note

Before you start reading, make sure you have the latest version of this installation guide, which is available at <https://support.sap.com/sltoolset> > System Provisioning > Install a System using Software Provisioning Manager > Installation Option of Software Provisioning Manager 1.0 > .

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


Version	Date	Description
1.0	2012-12-17	First version for Software Provisioning Manager 1.0
1.1 - 1.3	2013-04-02 - 2013-10-28	Updated Versions: SL Toolset 1.0 SPS 07 - SPS 09
1.4	2014-03-17	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 operating systems are highlighted accordingly.
1.5 - 2.1	2014-07-07 - 2016-06-06	Updated Versions: SL Toolset 1.0 SPS 11 - SPS 17
2.2	2016-10-07	Updated version for software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18): <ul style="list-style-type: none">Support for synchronous, near-synchronous and asynchronous replication for SAP Business Suite on SAP ASE 16.0. For more information, see Disaster Recovery Setup with SAP Business Suite on SAP ASE 16.0 [page 160] .
2.3	2017-02-06	Updated version for software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19) <ul style="list-style-type: none">New Features: Verification of the integrity of data units in Software Provisioning Manager, documented in: <i>New Features, Downloading the Software Provisioning Manager Archive</i>

Version	Date	Description
2.4	2017-05-22	<p>Updated version for software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)</p> <ul style="list-style-type: none"> • New Features: <ul style="list-style-type: none"> • New SAPUI5-based graphical user interface (GUI) "SL-UI", documented in: <i>Prerequisites for Running the Software Provisioning Manager, Running the Software Provisioning Manager, Useful Information About the Software Provisioning Manager</i> • Cleanup of operating system users, documented in: <i>SAP System Parameters, Creating Operating System Users and Groups</i>
2.5	2017-09-11	<p>Updated version for software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)</p> <ul style="list-style-type: none"> • New Features: <ul style="list-style-type: none"> • Media Signature Check, documented in: <i>New Features, Running the Software Provisioning Manager, Preparing the Installation Media</i> . This feature implies that section <i>Creating Kernel Archives from an Existing SAP System</i> has been deleted from this documentation because the related option in the software provisioning manager had to be removed. • Download Media for a Maintenance Plan, documented in: <i>New Features, Downloading Media for a Maintenance Plan</i> • SAP Host Agent Upgrade , documented in: <i>New Features, SAP System Parameters, Downloading SAP Kernel Archives (Archive-Based Installation)</i> • Support of SSL, documented in: <i>New Features, Enabling SSL encrypted data transfer</i>.

Version	Date	Description
2.6	2018-01-15	<p>Updated version for Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)</p> <ul style="list-style-type: none"> New Features: <ul style="list-style-type: none"> Digital signature check for installation archives, documented in: <i>New Features, Downloading SAP Kernel Archives (Archive-Based Installation) Archive-Based Installation for Diagnostics Agent, Downloading the SAP Kernel Archives Required for the Dual-Stack Split (Without Operating System and Database Migration), Downloading the SAP Kernel Archives Required for Operating System and Database Migration</i> Software provisioning manager Log Files Improvements, documented in: <i>New Features, Useful Information about the Software Provisioning Manager, Troubleshooting with the Software Provisioning Manager</i> Enabling IPv6, documented in: <i>New Features, Prerequisites for Running the Software Provisioning Manager</i> <i>New Features</i> section restructured: As of SP22, a dedicated subsection for each new SP has been created. New features below SP22 remain in a common table. The Java SDT GUI - which was in the SP21 version still available in parallel to the SL-UI - has been deprecated with SP22. As of SP22, SL-UI is the only available GUI of the software provisioning manager: <ul style="list-style-type: none"> The following sections which were explicitly related to Java SDT GUI were completely removed from this documentation: <i>Performing a Remote Installation Remote Processing of the Software Provisioning Manager (Java SDT GUI only), Starting the Java SDT GUI Separately, Running the Software Provisioning Manager in Accessibility Mode</i> (general accessibility information was moved to <i>Useful Information About the Software Provisioning Manager</i>). The Java SDT GUI-specific information was removed from the common software provisioning manager sections: <i>Running the Software Provisioning Manager, Useful Information About the Software Provisioning Manager, Interrupted Processing of the Software Provisioning Manager, Troubleshooting with the Software Provisioning Manager, Deleting an SAP System or Single Instances</i> New section <i>Using the Step State Editor (SAP Support Experts Only)</i> was added to section <i>Additional Information About the Software Provisioning Manager</i> Option to install the SCS instance with an embedded SAP Web Dispatcher, documented in: <i>New Features, SCS Instance with Embedded SAP Web Dispatcher, Additional Parameters for an SAP Web Dispatcher Installation Embedded in the SCS Instance (Optional)</i>

Note

This feature was retroactively released on 2018-02-12.

Version	Date	Description
2.7	2018-05-07	Updated version for Software Provisioning Manager 1.0 SP23 (SL Toolset 1.0 SP23) <ul style="list-style-type: none"> New Features: <ul style="list-style-type: none"> New Software Provisioning Manager Option Download Media for a Maintenance Plan, documented in: <i>New Features, Downloading the Media for a Maintenance Planner Transaction</i> Option to install the SCS instance with an embedded SAP Web Dispatcher, documented in: <i>New Features, SCS Instance with Embedded SAP Web Dispatcher, Parameters for Additional Components to be Included in the SCS Instance</i>
2.8	2018-09-17	Updated version for Software Provisioning Manager 1.0 SP24 (SL Toolset 1.0 SP24)
2.9	2019-01-21	Updated version for Software Provisioning Manager 1.0 SP25 (SL Toolset 1.0 SP25)
3.0	2019-05-27	Updated version for Software Provisioning Manager 1.0 SP26 (SL Toolset 1.0 SP26) <ul style="list-style-type: none"> New Chapter <p>For advanced SAP ASE audit options, you must adapt the size according to the enabled options and the workload of your system. You can place the devices containing the optional database sybsecurityarchive at this location. For more information, see SAP ASE 16.0: Auditing with SAP Adaptive Server Enterprise [page 159].</p>
3.1.1	2019-07-02	Updated version for Software Provisioning Manager 1.0 SP26 (SL Toolset 1.0 SP26) <p>Use installation options for additional SAP system instances of SAP NetWeaver 7.5 Java for SAP Solution Manager 7.2 Java SP10 or higher. Documented in: <i>Constraints, Running the Software Provisioning Manager</i></p>
3.2	2019-09-16	Updated version for Software Provisioning Manager 1.0 SP27 (SL Toolset 1.0 SP27)
3.3	2020-01-20	Updated version for Software Provisioning Manager 1.0 SP28 (SL Toolset 1.0 SP28)
3.4	2020-06-08	Updated version for Software Provisioning Manager 1.0 SP29 (SL Toolset 1.0 SP29)
3.5	2020-10-05	Updated version for Software Provisioning Manager 1.0 SP30 (SL Toolset 1.0 SP30)
3.6	2021-02-15	Updated version for Software Provisioning Manager 1.0 SP31 (SL Toolset 1.0 SP31)
3.7	2021-06-21	Updated version for Software Provisioning Manager 1.0 SP32 (SL Toolset 1.0 SP32)
3.8	2021-10-11	Updated version for Software Provisioning Manager 1.0 SP33 (SL Toolset 1.0 SP33)
3.9	2022-02-14	Updated version for Software Provisioning Manager 1.0 SP34 (SL Toolset 1.0 SP34)
3.95	2022-03-25	Linux only: Updated version of the installation guide with systemd released (see SAP Note 3139184 )
4.0	2022-05-24	Updated version for Software Provisioning Manager 1.0 SP35 (SL Toolset 1.0 SP35)

Version	Date	Description
4.0.1	2022-10-10	Updated version for software provisioning manager 1.0 SP35 (SL Toolset 1.0 SP35): Last version containing information about no longer supported operating systems and CPU architectures according to SAP Note 2998013 .
4.1	2022-10-10	Updated version for Software Provisioning Manager 1.0 SP36 (SL Toolset 1.0 SP36)
4.2	2023-02-13	Updated version for Software Provisioning Manager 1.0 SP37 (SL Toolset 1.0 SP37)
4.3	2023-05-26	Updated version for Software Provisioning Manager 1.0 SP38 (SL Toolset 1.0 SP38)
4.3.1	2023-10-09	Updated version for software provisioning manager 1.0 SP38 (SL Toolset 1.0 SP38): Last version containing information about no longer supported Windows operating systems according to SAP Note 3346502 .

1 About this Document

This installation guide describes how to install an SAP system based on the application server **Java** of and SAP Solution Manager 7.2 SR2 Java, using the installation tool software provisioning manager 1.0 SP38 (“software provisioning manager” for short), which is part of SL Toolset 1.0 SP38.

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 Products Based on SAP NetWeaver 7.5 and SAP Solution Manager 7.2 SR2 Java Supported for Installation Using Software Provisioning Manager 1.0 \[page 11\]](#).

i Note

As an alternative to using Software Provisioning Manager, you can install your system with a completely automated end-to-end framework available using SAP Landscape Management. For more information, see SAP Note [1709155](#) and https://help.sap.com/docs/SAP_LANDSCAPE_MANAGEMENT_ENTERPRISE.

For information about **maintenance of SAP Business Suite and corresponding SAP NetWeaver versions**, see SAP Note [1648480](#).

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 \[page 15\]](#) before you continue with this installation guide.

[SAP Products Based on SAP NetWeaver 7.5 and SAP Solution Manager 7.2 SR2 Java Supported for Installation Using Software Provisioning Manager 1.0 \[page 11\]](#)

Here you can find a list of the SAP products based on SAP NetWeaver 7.5 Java and SAP Solution Manager 7.2 SR2 Java that are supported for installation using Software Provisioning Manager 1.0, on the specific operating system and database combination described in this guide.

[Naming Conventions \[page 13\]](#)

This section lists the naming conventions that are currently apply for the software provisioning manager 1.0 and terms used in this documentation.

[Constraints \[page 14\]](#)

This section lists the naming constraints that are currently valid for the software provisioning manager 1.0 and this documentation.

[Before You Start \[page 15\]](#)

Make sure that you have read the release-specific “Master Guide” for your SAP Business Suite application, SAP NetWeaver application, or SAP Solution Manager system before you continue with this installation guide.

[SAP Notes for the Installation \[page 16\]](#)

This section lists the most important SAP Notes relevant for an installation using Software Provisioning Manager

[New Features \[page 17\]](#)

This section provides an overview of the new features in software provisioning manager 1.0.

1.1 SAP Products Based on SAP NetWeaver 7.5 and SAP Solution Manager 7.2 SR2 Java Supported for Installation Using Software Provisioning Manager 1.0

Here you can find a list of the SAP products based on SAP NetWeaver 7.5 Java and SAP Solution Manager 7.2 SR2 Java that are supported for installation using Software Provisioning Manager 1.0, on the specific operating system and database combination described in this guide.

SAP Product	Based on the following SAP NetWeaver Release
SAP S/4HANA 2022 Java	SAP NetWeaver 7.5
SAP S/4HANA 2021 Java	SAP NetWeaver 7.5
SAP S/4HANA 2020 Java	SAP NetWeaver 7.5
SAP S/4HANA 1909 Java	SAP NetWeaver 7.5
SAP S/4HANA 1809 Java	SAP NetWeaver 7.5
SAP S/4HANA 1709 Java	SAP NetWeaver 7.5
SAP S/4HANA 1610 Java (Out of Maintenance since December 2021)	SAP NetWeaver 7.5

Caution

The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note [3220901](#))

SAP S/4HANA ON-PREMISE 1511 Java (Out of Maintenance since December 2020)	SAP NetWeaver 7.5
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Caution

The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note [3220901](#))

)

SAP Product

Based on the following SAP NetWeaver Release

SAP Business Suite 7i 2016:

- EHP4 for SAP CRM 7.0 Java
- EHP8 for SAP ERP 6.0 Java
- EHP4 for SAP SRM 7.0 Java

SAP NetWeaver 7.5

i Note

For implementing **SAP Business Suite systems based on the Application Server Java of SAP NetWeaver 7.5** you have to run an [Installation Using a Stack XML File \[page 33\]](#) since the installation options for these product releases are no longer available on the *Welcome* screen of Software Provisioning Manager 1.0.

SAP Business Suite 7i 2013 Support Release 2:

- EHP3 for SAP CRM 7.0 Java Support Release 2 (**exception:** SAP CRM Application Server Java not supported on SAP NetWeaver 7.5)
- EHP7 for SAP ERP 6.0 Java Support Release 2 (**exception:** SAP XECO not supported on SAP NetWeaver 7.5)
- EHP3 for SAP SRM 7.0 Java Support Release 2

SAP NetWeaver 7.5

i Note

For implementing **SAP Business Suite systems based on the Application Server Java of SAP NetWeaver 7.5** you have to run an [Installation Using a Stack XML File \[page 33\]](#) since the installation options for these product releases are no longer available on the *Welcome* screen of Software Provisioning Manager 1.0.

SAP Business Suite 7i 2011 Java:

- EHP2 for SAP CRM 7.0 Java (**exception:** SAP CRM Application Server Java not supported on SAP NetWeaver 7.5)
- EHP6 for SAP ERP 6.0 Java (**exception:** SAP XECO not supported on SAP NetWeaver 7.5)
- EHP2 for SAP SRM 7.0 Java

SAP NetWeaver 7.5

i Note

For implementing **SAP Business Suite systems based on the Application Server Java of SAP NetWeaver 7.5** you have to run an [Installation Using a Stack XML File \[page 33\]](#) since the installation options for these product releases are no longer available on the *Welcome* screen of Software Provisioning Manager 1.0.

SAP Business Suite 7i 2010 Java:

- EHP1 for SAP CRM 7.0 Java (**exception:** SAP CRM Application Server Java not supported on SAP NetWeaver 7.5)
- EHP5 for SAP ERP 6.0 Java (**exception:** SAP XECO not supported on SAP NetWeaver 7.5)

SAP NetWeaver 7.5

i Note

For implementing **SAP Business Suite systems based on the Application Server Java of SAP NetWeaver 7.5** you have to run an [Installation Using a Stack XML File \[page 33\]](#) since the installation options for these product releases are no longer available on the *Welcome* screen of Software Provisioning Manager 1.0.

SAP Product	Based on the following SAP NetWeaver Release
<p>SAP Business Suite 7 Java:</p> <ul style="list-style-type: none"> SAP CRM 7.0 Java (exception: SAP CRM Application Server Java not supported on SAP NetWeaver 7.5) EHP4 for SAP ERP 6.0 Java (exception: SAP XECO not supported on SAP NetWeaver 7.5) 	<p>SAP NetWeaver 7.5</p> <div data-bbox="805 421 1393 678" style="background-color: #f0f0f0; padding: 5px;"> <p>i Note</p> <p>For implementing SAP Business Suite systems based on the Application Server Java of SAP NetWeaver 7.5 you have to run an Installation Using a Stack XML File [page 33] since the installation options for these product releases are no longer available on the Welcome screen of Software Provisioning Manager 1.0.</p> </div>
<p>SAP NetWeaver 7.5</p> <div data-bbox="194 761 790 1019" style="background-color: #f0f0f0; padding: 5px;"> <p>i Note</p> <p>SAP NetWeaver 7.5 Java is also contained in the following optional standalone units:</p> <ul style="list-style-type: none"> Advanced Adapter Engine Advanced Adapter Engine Extended (AEX) Process Orchestration </div>	<p>SAP NetWeaver 7.5</p>
<p>SAP Solution Manager 7.2 Support Release 2</p>	<p>SAP NetWeaver 7.4 Support Release 2</p>

1.2 Naming Conventions

This section lists the naming conventions that are currently apply for the software provisioning manager 1.0 and terms used in this documentation.

- The software provisioning manager 1.0 is the successor of the product- and release-specific delivery of provisioning tools, such as “SAPinst”.
Before you perform an installation from scratch or a target system installation in the context of a system copy, we strongly recommend that you always download the latest version of the software provisioning manager 1.0 which is part of the Software Logistics Toolset 1.0 (“SL Toolset” for short). For more information, see [Preparing the Installation Media \[page 88\]](#).
This way, you automatically get the latest version with the latest fixes of the tool and supported processes. For more information about the software provisioning manager 1.0 as well as products and releases supported by it, see SAP Note [1680045](#) and <https://wiki.scn.sap.com/wiki/display/SL/Software+Provisioning+Manager+1.0+and+2.0>.
The “SAPinst” tool has been renamed to “software provisioning manager”, but the terms “SAPinst” and “sapinst” are still used in:
 - The name of the technical framework of the software provisioning manager. For more information about the current SAPinst Framework version, see SAP Note [3207613](#) (*SAPinst Framework 753 Central Note*).
 - Texts and screen elements in the the software provisioning manager's SL-UI

- Names of executables, for example `sapinst`
- Names of command line parameters, for example `SAPINST_STACK_XML`
- Names of operating system user groups, such as the 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 more information, see SAP Note [1970349](#).
For more information, see [New Features \[page 17\]](#).
- “SAP system” refers to SAP system based on the application server of SAP NetWeaver 7.4 (**SAP Solution Manager 7.2 SR2 only**) / SAP NetWeaver 7.5.
- “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

This section lists the naming constraints that are currently valid for the software provisioning manager 1.0 and this documentation.

- 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*.
- 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 the [list of supported products \[page 11\]](#) and 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 7.5 - 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 SAP Adaptive Server Enterprise Cluster Edition is not supported.
- Raw devices are not supported.
- 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 \[page 175\]](#).
- Options to install additional SAP system instances for **SAP Solution Manager 7.2 Java Support Release 1**: Use these options only for SAP Solution Manager 7.2 Java lower than SP09.

For SAP Solution Manager 7.2 Java SP09 or higher, use the options of SAP NetWeaver 7.5 Java.
 For more information, see [Running Software Provisioning Manager \[page 113\]](#).

1.4 Before You Start

Make sure that you have read the release-specific “Master Guide” for your SAP Business Suite application, SAP NetWeaver application, or SAP Solution Manager system 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 this guide in your installation package or you can download the latest version from <https://help.sap.com>.

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

Document	Internet Address
Master Guide – SAP NetWeaver 7.5	http://help.sap.com/nw75 ▶▶ Installation and Upgrade ▶
Master Guide – SAP Solution Manager 7.2	http://help.sap.com/solutionmanager ▶▶ 7.2 <SP> ▶ Installation and Upgrade ▶
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 ▶
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 ▶
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 ▶
Master Guide - SAP Enhancement Package <Number> for SAP ERP 6.0	http://help.sap.com/erp ▶▶ <Release> ▶ Installation and Upgrade ▶

1.5 SAP Notes for the Installation

This section lists the most important SAP Notes relevant for an installation using Software Provisioning Manager

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 <https://support.sap.com/notes>.

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
1748888	Inst. Systems Based on SAP NetWeaver 7.3 and higher: SAP ASE	software provisioning manager 1.0: SAP NetWeaver 7.3 and higher
1554717	Planning Information for SAP on ASE 16.0	SAP release information for customers deploying SAP on SAP ASE 16.0
1585981	Backup Instructions for SAP on ASE 16.0	Information about backup and recovery (valid for SAP ASE 16.0)
1650511	High Availability Offerings with SAP ASE	Information about high availability cluster solutions for SAP ASE 16.0
737368	Hardware requirements of Java Development Infrastructure	Information on the hardware requirements for Java Development Infrastructure, which depends on the size of your development team
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
2369910	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

SAP Note Number	Title	Description
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.
886535	Downloading multispanning archives	Downloading multispanning archives

1.6 New Features

This section provides an overview of the new features in software provisioning manager 1.0.

Make sure that you also read the [Release Notes](#) for your SAP product at <https://help.sap.com> >> <Search your SAP Product> > <Select your SAP Product Version> > [What's New](#) >.

Feature	Description	Availability
New SAPinst Framework Version 753	The SAPinst framework patch level has been upgraded from version 749 (SAP Note 2393060 SAPinst Framework 749 Central Note) to 753. For more information, see SAP Note 3207613 SAPinst Framework 753 Central Note .	software provisioning manager 1.0 SP36 (SL Toolset 1.0 SP36)
Linux: Native systemd support	Linux only: Starting with SUSE Linux Enterprise Server 15, Red Hat Enterprise Linux 8, and Oracle Linux 8, and the respective SAP kernel patch levels, native support for the software suite systemd for Linux is available for SAP systems. For more information about Linux with systemd, see SAP Note 3139184 . When you install SAP systems using software provisioning manager 1.0 SP34 or higher, native systemd support is automatically activated.	software provisioning manager 1.0 SP34 (SL Toolset 1.0 SP34)
Support of AIX 7.3	AIX 7.3 is now supported for all software lifecycle management options from software provisioning manager. For more information, see SAP Note 3104875 .	software provisioning manager 1.0 SP34 (SL Toolset 1.0 SP34)
Switch from 7.21_EXT Kernel to 7.22_EXT Kernel	Kernel 7.21 has reached end of maintenance. In addition, some issues have been fixed with the new 7.22_EXT kernel media.	software provisioning manager 1.0 SP31 (SL Toolset 1.0 SP31)
New Look and Feel of SL-UI	As of version 1.0 SP24 Patch Level (PL) 5, the software provisioning manager comes with a new look and feel of the SL-UI. For more information, see https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/ .	software provisioning manager 1.0 SP24, PL05 (SL Toolset 1.0 SP24)

Feature	Description	Availability
New software provisioning manager Option <i>Download Software Packages for Maintenance Planner Transaction</i>	If you perform an installation using a Stack XML file, you can now download media according to a Maintenance Plan. For more information, see Installation Using a Stack XML File [page 33] , Downloading Software Packages for a Maintenance Planner Transaction [page 96] , and https://blogs.sap.com/2018/06/01/software-provisioning-manager-new-option-for-standalone-download-service/  .	software provisioning manager 1.0 SP23 (SL Toolset 1.0 SP23)
Option to install an SCS instance with embedded SAP Web Dispatcher	You can now install an SAP Web Dispatcher in an SCS instance. You can choose this option while running the SCS instance installation. For more information, see SCS Instance with Embedded SAP Web Dispatcher [page 29]	software provisioning manager 1.0 SP23 (SL Toolset 1.0 SP23)
software provisioning manager Log Files Improvements	software provisioning manager log files are now available immediately after software provisioning manager has been started, that is before a product has been selected on the <i>Welcome</i> screen. For more information, see Useful Information about Software Provisioning Manager [page 120] and Troubleshooting with Software Provisioning Manager [page 131] .	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)
Digital Signature Check of Installation Archives	The digital signature of installation archives is checked automatically by software provisioning manager during the <i>Define Parameters</i> phase while processing the <i>Software Package Browser</i> screens. As of now software provisioning manager only accepts archives whose digital signature has been checked. For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 94] and SAP Note 2541751  - SYB: Software Provisioning Manager RDBMS content has been tampered .	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)
Enabling IPv6	You can now set up a new SAP system or SAP system instance using Internet Protocol Version 6 (IPv6). For more information, see Prerequisites for Running Software Provisioning Manager [page 110] .	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)
Option to install an SCS instance with embedded SAP Web Dispatcher	You can now install an SAP Web Dispatcher in an SCS instance. You can choose this option while running the SCS instance installation. For more information, see SCS Instance with Embedded SAP Web Dispatcher [page 29]	software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)
Media Signature Check	The digital signature of media is checked automatically by the software provisioning manager during the <i>Define Parameters</i> phase while processing the <i>Media Browser</i> screens. The software provisioning manager only accepts media whose digital signature has been checked. For more information, see Preparing the Installation Media [page 88] and Running the software provisioning manager [page 113] .	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)

Feature	Description	Availability
SAP Host Agent Upgrade During the Installation (Optional)	During the <i>Define Parameters</i> phase of the installation, software provisioning manager prompts you whether you want to upgrade an existing version of the SAP Host Agent on the installation host. If there is no SAP Host Agent on the installation host, it is installed automatically without prompt. For more information, see the <i>General Parameters</i> table in SAP System Parameters [page 52] .	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)
Secure Sockets Layer (SSL) encrypted data transfer	The feature <i>SSL encrypted data transfer</i> is available for SAP ASE 16.0 SP02 starting with PL6. For general limitations and prerequisites refer to SAP Note 2481596 - SYB: <i>Encrypted data transfer between SAP System and SAP ASE database</i> . The SAP software provisioning manager offers the possibility to enable the SSL encrypted data transfer via a checkbox. The SSL certificates are generated by the SAP software provisioning manager and enabled for the database server and the SAP application server. There are no manual steps necessary to configure the usage of SSL for the purpose of encrypted data transfer. For more information see Enabling SSL Encrypted Data Transfer [page 179]	software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)
SL-UI with SAPINST 7.49	With the new software provisioning manager framework version SAPINST 7.49, you can now use the new SAPUI5-based graphical user interface (GUI) "SL-UI". For more information, see Useful Information about Software Provisioning Manager [page 120] , Running Software Provisioning Manager [page 113] .	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)
Cleanup of Operating System Users	You can now specify during the <i>Define Parameters</i> phase that the operating system users are to be removed from group <code>sapinst</code> after the execution of software provisioning manager has completed. For more information, see <i>Operating System Users</i> in SAP System Parameters [page 52] .	software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)
Verification of Integrity of Data Units in software provisioning manager	The integrity of data units extracted from the software provisioning manager archive is verified. For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 92] . In addition, check SAP Note 1680045 whether additional information is available.	software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
Archive-Based Installation	You can now download the 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] .	software provisioning manager 1.0 SP17 (SL Toolset 1.0 SP17)

Feature	Description	Availability
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)
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> <p>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.</p> <p>For more information, see the <i>Upgrade Master Guide - SAP NetWeaver 7.5</i> at: https://help.sap.com/nw75 >> <i>Installation and Upgrade</i></p>	software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)
System Provisioning for SAP Solution Manager 7.2	<p>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.</p>	software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)

Feature	Description	Availability
Creating Kernel Archives from existing SAP System	<p>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 *.SAR archives based on the *.lst files from the executable (.exe) directories of the source SAP system.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>i Note</p> <p>This feature is only available for Unicode systems.</p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>⚠ Caution</p> <p>This feature has been deprecated with Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21) and the related option has been removed from the <i>Welcome</i> screen. This deprecation has been accomplished to ensure compliancy with the new feature "Media Signature Check" of Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21) described above in this table.</p> </div>	software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)
Usage Type Library Deprecation for SAP Systems Based on SAP NetWeaver 7.3 EHP1 and Higher	<p>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.</p>	software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
Adaptive Installation	<p>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.</p> <p>For more information, see SAP System Parameters [page 52].</p>	software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
Feedback Evaluation Form	<p>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.</p> <p>Port 4239 is used for displaying the feedback evaluation form. For more information, see Prerequisites for Running Software Provisioning Manager [page 110].</p>	software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)

Feature	Description	Availability
Option <i>Verify Signed Media</i>	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.	software provisioning manager 1.0 SP06 (SL Toolset 1.0 SP11)
For more information, see SAP Note 1979965 .		

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.

After you have decided on the installation option that you want to use, continue with [Planning \[page 32\]](#).

[Standard System \[page 23\]](#)

[Distributed System \[page 24\]](#)

[High-Availability System \[page 25\]](#)

[Additional Application Server Instance \[page 26\]](#)

[SCS Instance with Embedded SAP Web Dispatcher \[page 29\]](#)

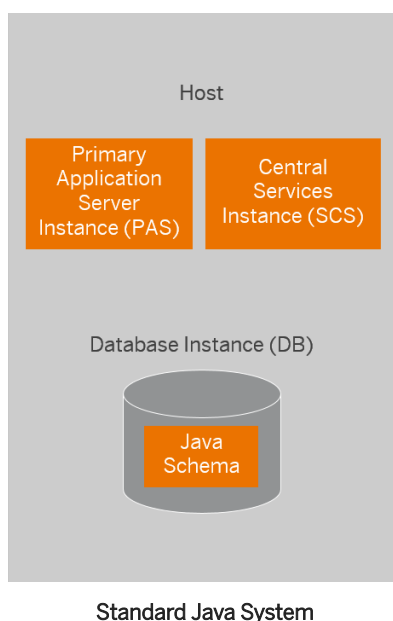
2.1 Standard System

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

There are the following instances:

- Central services instance (SCS instance)
Contains the Java message server and the Java enqueue server
Optionally, you can install the SCS instance with an embedded SAP Web Dispatcher. For more information, see [SCS Instance with Embedded SAP Web Dispatcher \[page 29\]](#).
- Database instance (DB)
- Primary application server instance (PAS instance)

Additionally, you can install one or more additional application server instances. For more information, see [Additional Application Server Instance \[page 26\]](#).



2.2 Distributed System

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:

i Note

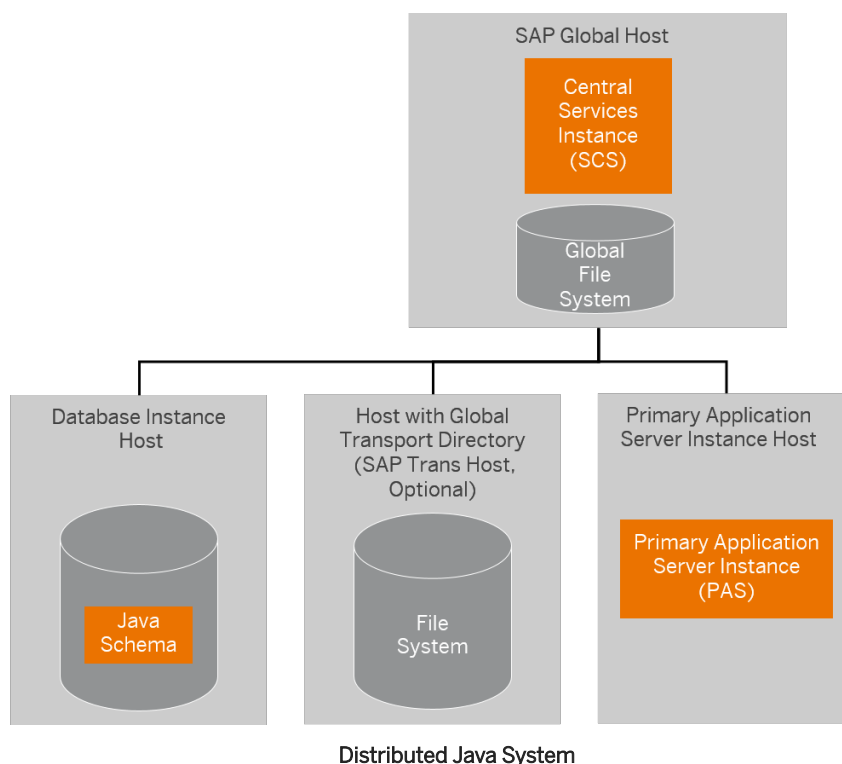
We strongly recommend installing the ASCS instance on the same host as the primary application server. The installation of the ASCS instance on a separate host is reserved for high-availability configurations on Windows that are not using Microsoft Failover Clustering.

- Central services instance (SCS instance)
Contains the Java message server and the Java enqueue server
Optionally, you can install the SCS instance with an embedded SAP Web Dispatcher. For more information, see [SCS Instance with Embedded SAP Web Dispatcher \[page 29\]](#).
- Database instance (DB)
The Java 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 SCS instance as global file system. That means that the host with the SCS 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 \[page 26\]](#).



2.3 High-Availability System

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.

i Note

The High-Availability System is valid only for SAP ASE 16.0.

There are the following instances:

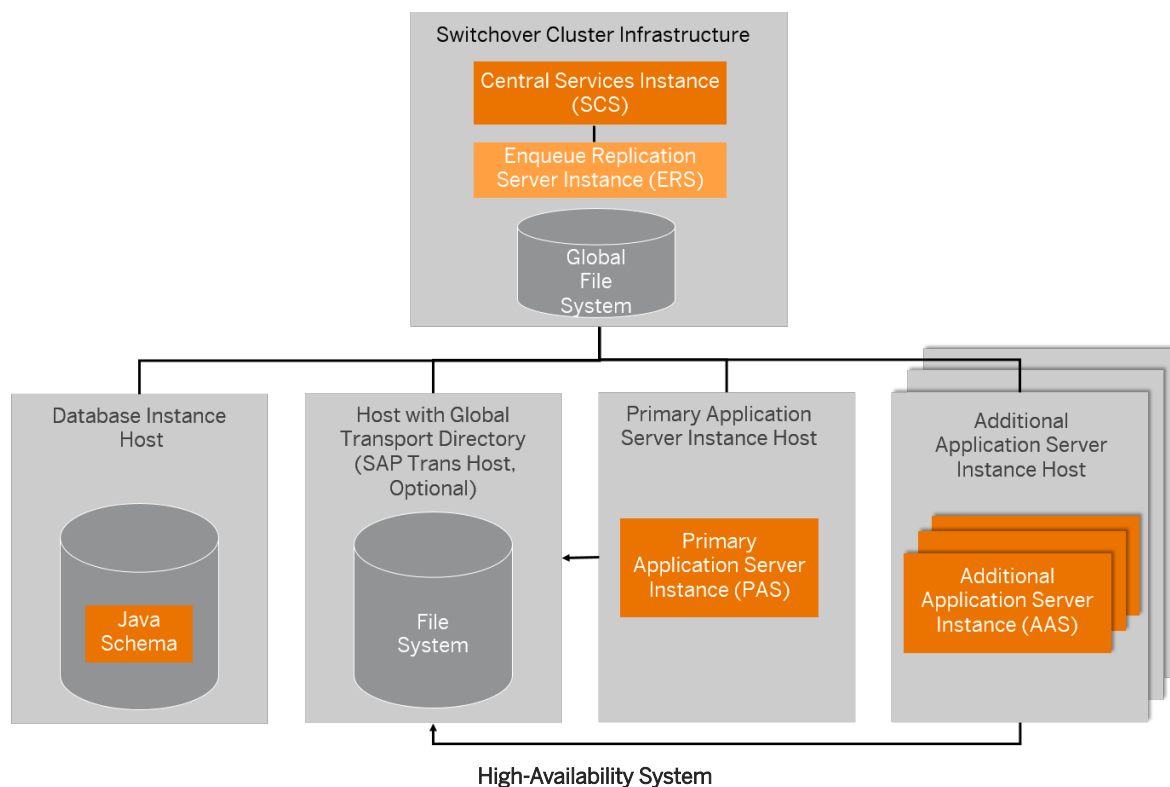
- Central services instance (SCS instance)
Contains the Java message server and the Java enqueue server
Optionally, you can install the SCS instance with an embedded SAP Web Dispatcher. For more information, see [SCS Instance with Embedded SAP Web Dispatcher \[page 29\]](#).
- ERS instance for the SCS instance (mandatory)
The ERS instance contains the replication table, which is a copy of the lock table in the SCS instance.
- Database instance (DB)
- Primary application server instance (PAS)

The graphics below each assumes that you run the SCS instance and the ERS 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.

We recommend that you run the SCS instance in a switchover cluster infrastructure.

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 \[page 26\]](#).

The following figure shows an example for the distribution of the SAP system instances in a high-availability system.



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

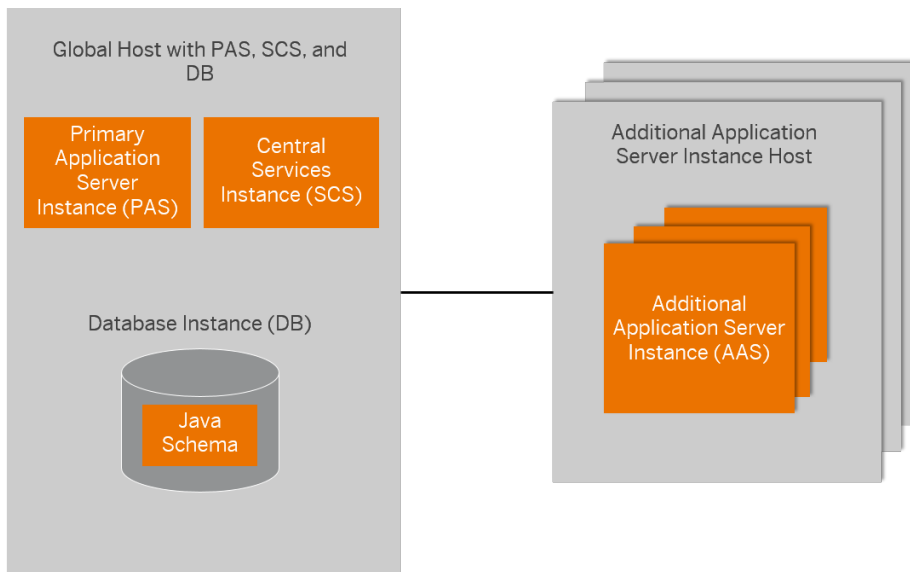
i Note

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 \[page 179\]](#). For example, you need to do this if your primary application server instance runs on Linux for z System 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



Additional Application Server Instance for a Standard Java System

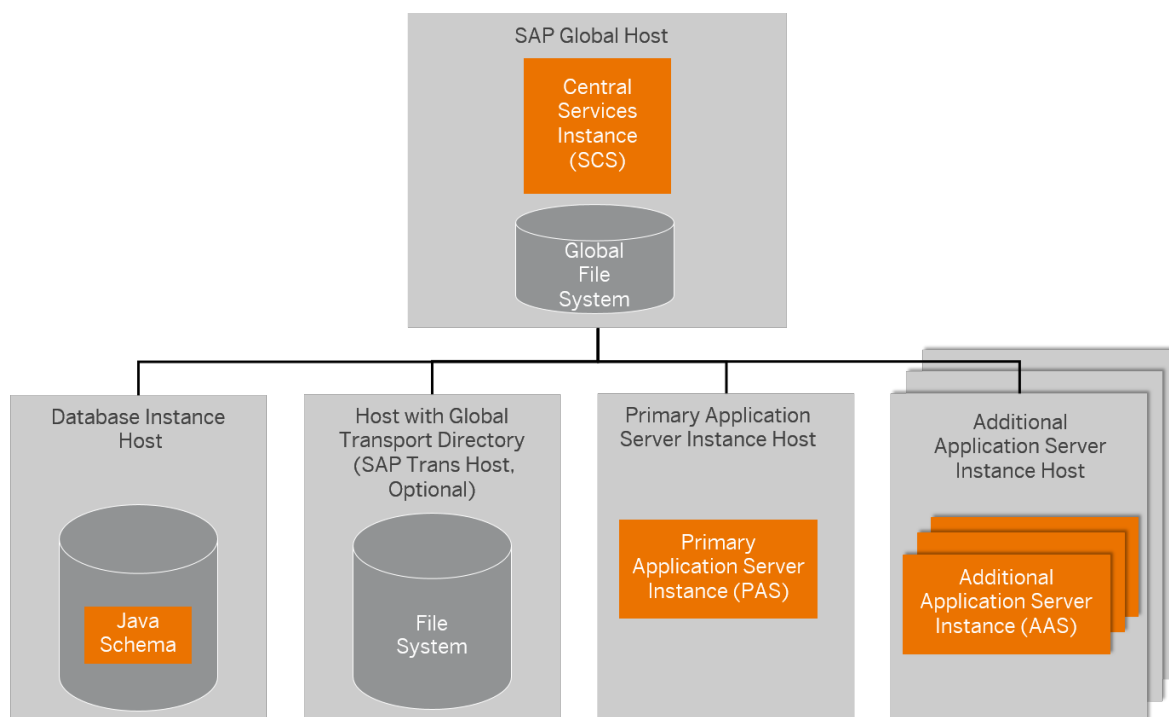
For more information, see [Standard System \[page 23\]](#).

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.



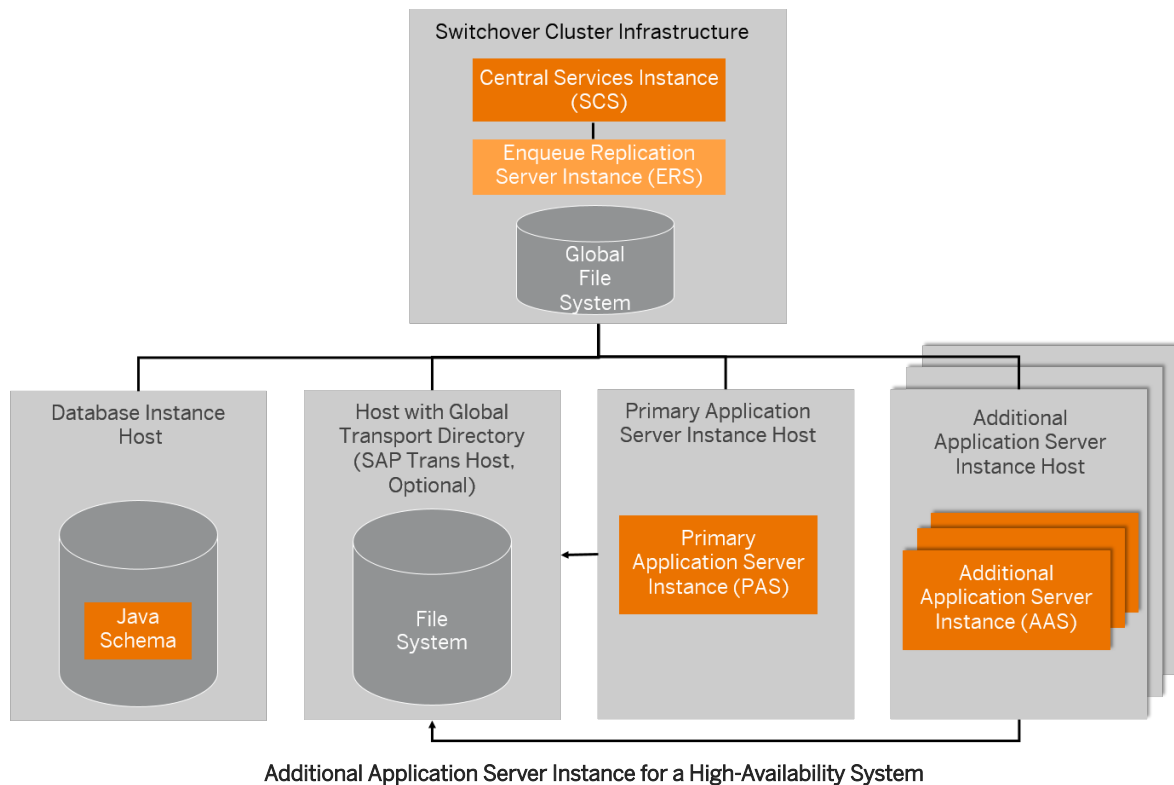
Additional Application Server Instance for a Distributed Java System

For more information, see [Distributed System \[page 24\]](#).

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



For more information, see [High-Availability System \[page 25\]](#).

2.5 SCS Instance with Embedded SAP Web Dispatcher

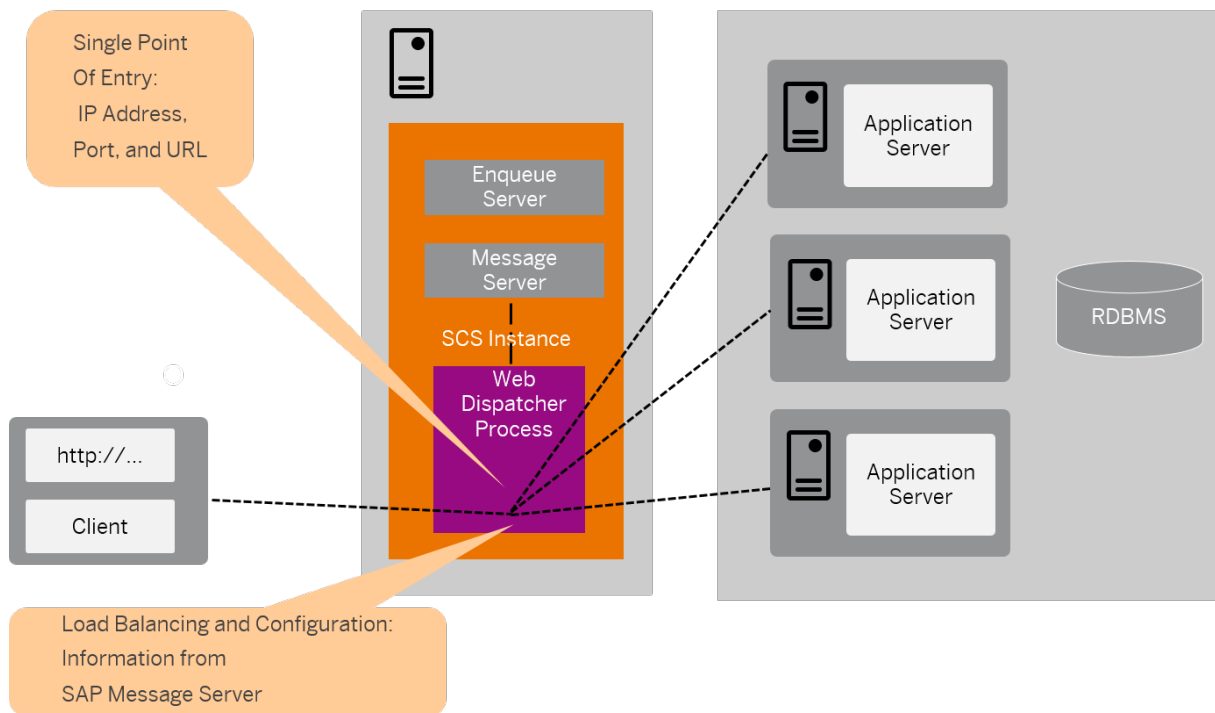
You can install an SAP Web Dispatcher embedded in the SCS instance. If you select this option, an SAP Web Dispatcher is installed running within the SCS instance. No separate SAP Web Dispatcher instance and no dedicated <SAPSID> are created for the SAP Web Dispatcher.

→ Recommendation

The embedded SAP Web Dispatcher is subject to a number of limitations. For more information, see SAP Note [3115889](#). It is a convenience option for small systems, but is not recommended for production systems. The general recommendation is to install a standalone SAP Web Dispatcher instead.

i Note

We only recommend this option for special scenarios. For more information, see SAP Note [908097](#). The embedded SAP Web Dispatcher is subject to a number of limitations. For more information, see SAP Note [3115889](#). It is a convenient option for small systems, but is not recommended for production systems. The general recommendation is to install a standalone SAP Web Dispatcher instead. For an SAP Web Dispatcher installation, a standalone installation (see below) continues to be the default scenario.



SCS Instance with Embedded 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 SCS 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 of SAP Web Dispatcher for SAP Systems Based on SAP NetWeaver 7.0 to 7.52 on <OS>](https://support.sap.com/slttoolset) which you can find at <https://support.sap.com/slttoolset> >>> [Installation Option of Software Provisioning Manager 1.0](#) > [Installation Option of Software Provisioning Manager 1.0](#) > [Installation Guides - Standalone Engines and Clients - Software Provisioning Manager 1.0](#) > [SAP Web Dispatcher](#).

More Information

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

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none">• SAP Solution Manager 7.2 SR2 only: 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</i> ▶ <i>Application Server Infrastructure</i> ▶ <i>Components of SAP NetWeaver Application Server</i> ▶ <i>SAP Web Dispatcher</i></p>

Related Information

[Parameters for Additional Components to be Included in the SCS Instance \[page 63\]](#)

3 Planning

3.1 Planning Checklist

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

i Note

For implementing [SAP Business Suite systems based on the Application Server Java of SAP NetWeaver 7.5 \[page 11\]](#) you have to run an [Installation Using a Stack XML File \[page 33\]](#) since the installation options for these product releases are no longer available on the [Welcome](#) screen of Software Provisioning Manager 1.0.

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

Detailed information about the steps are available in the linked sections.

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 \[page 15\]](#) .
2. You have decided on your installation option (see [Installation Options Covered by this Guide \[page 23\]](#)).

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. Since an SAP system on IBM Db2 for z/OS system is always a distributed constellation, we only offer two installation options: standard or high-availability.

1. **Installation Using a Stack XML File [page 33]:**

If you want to install an SAP Java system along with the required Support Package stack 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 the software provisioning manager by calling it with command line 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).

→ Recommendation

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

2. [Installation Using a Stack XML File \[page 33\]](#):

If you want to install an SAP Process Integration 7.5 system or an SAP Solution Manager 7.2 system comprising ABAP and Java, both the ABAP and the Java system must be installed with the identical Support Package (SP) level.

3. You [check the hardware and software requirements \[page 35\]](#) on every installation host.
4. You [plan how to set up user and access management \[page 50\]](#).
5. You identify [Basic SAP System Installation Parameters \[page 51\]](#).
6. You [carefully plan the setup of your database \[page 64\]](#).
7. You [decide on the transport host to use \[page 66\]](#).
8. You decide whether you want to [integrate LDAP Directory Services in your SAP system \[page 162\]](#).
9. To install a high-availability system, you read [Planning the Switchover Cluster for High Availability \[page 66\]](#).
10. Continue with [Preparation \[page 70\]](#).

Additional Application Server Instance

1. You check the [hardware and software requirements \[page 35\]](#) 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 \[page 51\]](#).
3. Continue with [Preparation \[page 70\]](#).

3.2 Installation Using a Stack XML File

The option to perform an installation using a Stack XML file (also called “up-to-date installation” or “UDI” for short) improves 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:

- The Maintenance Planner
- software provisioning manager (the “software provisioning manager” for short)
- Software Update Manager (abbreviated as “SUM”)

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

i Note

For implementing [SAP Business Suite systems based on the Application Server Java of SAP NetWeaver 7.5 \[page 11\]](#) you have to run an installation using a Stack XML file since the installation options for these product releases are no longer available on the [Welcome](#) screen of Software Provisioning Manager 1.0.

→ Recommendation

We recommend that you perform the installation using a Stack XML file for new products, such as SAP S/4HANA or [SAP Solution Manager 7.2](#).

Restrictions

You cannot perform a target system installation in the context of a system copy as an installation with a Stack XML file.

Prerequisites

- You must have an S-User with the authorization to access and use the Maintenance Planner at <https://apps.support.sap.com/sap/support/mp>.
- For additional information about involved tools and supported SAP system releases, see SAP Note [2277574](#).

Features

An installation using a Stack XML file provides the following features:

- You can use a Stack XML file generated by the Maintenance Planner at <https://apps.support.sap.com/sap/support/mp>. The parameters contained in the Stack XML file can then be processed by software provisioning manager to get better integrated with SUM and to simplify the process of installation for a new system on a target software level. This makes IT administration easier by reducing the efforts in Total Cost of Ownership (TCO). For more information, see the *Best Practice Guide to Planning Landscape Changes* at <https://support.sap.com/en/tools/software-logistics-tools/landscape-management-process.html>.
- When processing a Stack XML file, software provisioning manager 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 <https://blogs.sap.com/2016/10/21/up-to-date-installation-2/>.

i Note

The procedure and the screenshots provided in the linked document are **only an example** to show how an up-to-date installation works in general for an example SAP product, and what the benefits are.




This document is **not** intended to serve as a detailed instruction for an up-to-date-installation of any supported SAP product.

- You can also run an installation using a Stack XML file in **unattended mode** as described in [System Provisioning Using an Input Parameter File \[page 122\]](#) .
- You can use software provisioning manager to directly download the installation software from SAP by providing the Maintenance Plan to software provisioning manager while running software provisioning manager option *Download Software Packages for Maintenance Planner Transaction*. For more information, see [Downloading Software Packages for a Maintenance Planner Transaction \[page 96\]](#).

Integration

If you want to install an SAP Process Integration 7.5 system or an SAP Solution Manager 7.2 system comprising ABAP and Java, consider the following additional requirements:

- Both the ABAP and the Java system must be installed with the identical Support Package (SP) level.
- The SAP system ID (SAPSID) of the ABAP system must be different from the SAPSID of the Java system.
- The installation with Stack XML file must be run separately, first for the ABAP system, then for the Java system.

The Software Update Manager (SUM) is started by the software provisioning manager at the end of the installation process. A browser window opens with a link to UI of the SUM that is already running. Follow the instructions on the SUM dialogs and in the SUM Guide at <https://support.sap.com/sltoolset>   [System Maintenance](#) .

Each section in this guide describing steps that are completely or at least partially automatized when using a Stack XML files is marked with an appropriate note at the beginning. These are the following sections:

- [Planning Checklist \[page 32\]](#)
- [Additional Parameters When Using a Stack XML File \[page 63\]](#)
- [Downloading Software Packages for a Maintenance Planner Transaction \[page 96\]](#)
- [Running Software Provisioning Manager \[page 113\]](#)

3.3 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

- 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 \[page 36\]](#).
 - Integrated in the installation tool (mandatory) as part of the installation process
For more information, see [Running Software Provisioning Manager \[page 113\]](#).
 - The hardware and software requirements tables in [Requirements for the SAP System Hosts \[page 38\]](#).
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

3.3.1 Running the Prerequisites Check in Standalone Mode (Optional)

This section describes how to run the prerequisites check in standalone mode. Running the prerequisites check in standalone mode is optional.

Context

When you install an SAP system, the software provisioning manager 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.

→ 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 and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#) .
2. Make either the separate `SAPPEX<Version>.SAR` archive or the complete kernel medium available as described in [Preparing the Installation Media \[page 88\]](#) .
3. Start the software provisioning manager as described in [Running Software Provisioning Manager \[page 113\]](#).
4. On the *Welcome* screen, choose **► <SAP_Product> ► <Database> ► Preparations ► Prerequisites Check** **►**.
5. Follow the instructions in the software provisioning manager dialogs and enter the required parameters.

i Note

To find more information on each parameter during the *Define Parameters* phase, position the cursor on the required parameter input field , and choose either `F1` or the *HELP* tab. Then the available help text is displayed in the *HELP* tab.

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.

Related Information

[Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#)

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

3.3.2 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 \[page 38\]](#)

[Hardware Requirements \[page 40\]](#)

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

[Other Requirements \[page 49\]](#)

3.3.2.1 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.

General Installation Information for Your Operating System

Operating System	Information
AIX	<p>Before you start the installation, make sure that you have read SAP Note In addition to the hardware and software requirements listed here, make sure that you also consult the hardware and software requirements provided by IBM at 1972803.</p> <p>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 https://www.sap.com/community/topic/aix.html.</p>

Operating System Information

HP-UX

In addition to the hardware and softwareBefore 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 *SAP on HP-UX Best Practices* space on the SAP Community Network at <https://www.sap.com/community/topic/hp-ux.html>.

SAP on ASE uses Concurrent I/O on HP-UX. The Veritas File System (Online JFS 5.0.1 or above) must be installed on your system prior to installing SAP applications on ASE and HP-UX. For more information, see SAP Note [1077887](#).

SAP Adaptive Server Enterprise 16.0: Install the following AioEnh patch: <https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.de?productNumber=AioEnh>.

SAP only supports the use of native binaries. Always use the appropriate SAP binaries for your processor.

Linux

Before you start the installation, make sure that you have read the SAP Notes for your Linux distribution listed in the central SAP Note [2369910](#).

In addition, we also recommend that you check the information available in the *SAP on Linux* space on the SAP Community Network at <https://www.sap.com/community/topic/linux.html>.

Solaris

Before you start the installation, make sure that you have read SAP Note [1669684](#).

In addition, we also recommend that you check the information available in the *SAP on Oracle Solaris* space on the SAP Community Network at <https://www.sap.com/community/topic/oracle-solaris.html>.

3.3.2.2 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.

Hardware Requirements

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>Database Instance:</p> <p>SAP ASE 16.0: All 64-bit processors that are capable of running the supported operating system versions for SAP ASE 16.0.</p> <p>All other instances: 2 dual core CPUs or 4 single core CPUs.</p> <p>For an SCS 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 separate SAP kernel archives instead of using the complete SAP kernel media, you require 2 GB of temporary disk space for the set of 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 94]. • 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> <ul style="list-style-type: none"> • For AS Java product instances such as Enterprise Portal, Enterprise Services Repository, and so on, check the sizing guide for your product instances at https://sap.com/sizing under Sizing Guidelines > Database and Technology. • For more information about space requirements for the file systems and directories of the instances, see SAP Directories [page 76] and the appropriate database-specific information listed below. <ul style="list-style-type: none"> • Central services instance (SCS): <ul style="list-style-type: none"> Minimum 2 GB If you install the SCS instance with an embedded SAP Web Dispatcher, for the installation as such you require at least 1 GB of hard disk space in addition. For production use of the SAP Web Dispatcher, you need to reserve at least 5 GB. • ERS instance for the SCS instance (if required): <ul style="list-style-type: none"> Minimum 2 GB • Database Instance: <ul style="list-style-type: none"> Database instance valid only for SAP ASE 16.0: Minimum 40 GB (depending on the SAP product to be installed) Database Software: 8 GB For safety reasons (system failure), the file systems must be physically distributed over several disks or RAID-technology must be used. • Primary application server instance: <ul style="list-style-type: none"> Minimum 4 GB for the AS Java + up to 2 GB for each additional product instance • Additional application server instance: <ul style="list-style-type: none"> Minimum 4 GB for the AS Java + up to 2 GB for each additional product instance • SAP Host Agent: <ul style="list-style-type: none"> Minimum 0.5 GB

Requirement	Values and Activities
RAM	<div data-bbox="488 360 1402 394" style="border: 1px solid green; padding: 2px;">Only valid for 'Platform': AIX</div> <div data-bbox="488 405 1402 555" style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>i Note</p> <p>AIX: Keep in mind that the operating system itself requires about 10% of the available RAM.</p> </div> <div data-bbox="488 566 1402 600" style="border: 1px solid green; padding: 2px;">End of 'Platform': AIX</div> <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"> • Central services instance (SCS instance) Minimum 1 GB • ERS instance for the SCS instance (if required) Minimum 1 GB • Database Instance: SAP ASE 16.0: 7 GB • Primary application server instance Minimum 8 GB <ul style="list-style-type: none"> • For more information about RAM required for Business Intelligence Java (BI Java), see SAP Note 927530. • For more information about RAM required for Java Development Infrastructure, see SAP Note 737368. • Additional application server instance: Minimum 8 GB • SAP Host Agent: Minimum 1 GB <div data-bbox="488 1357 1402 1391" style="border: 1px solid green; padding: 2px;">Only valid for 'Platform': HP-UX</div> <p>HP-UX: Refer to SAP Note 1112627 for the commands to display the RAM size on HP-UX.</p> <div data-bbox="488 1447 1402 1480" style="border: 1px solid green; padding: 2px;">End of 'Platform': HP-UX</div> <div data-bbox="488 1491 1402 1525" style="border: 1px solid green; padding: 2px;">Only valid for 'Platform': Linux</div> <p>Linux: For more information about how to evaluate main memory consumption on Linux, see SAP Note 1382721.</p> <div data-bbox="488 1603 1402 1637" style="border: 1px solid green; padding: 2px;">End of 'Platform': Linux</div>

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: In addition, you need at least 20 GB for the primary application server instance and at least another 10 GB for the SCS instance and also 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>
Oracle Solaris: Swap space	<p>You need hard disk drives with sufficient space for swap.</p> <p>At least 20 GB are required. For more information, see SAP Note 570375.</p>

Requirement	Values and Activities
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://launchpad.support.sap.com/#/software-center > <i>SUPPORT PACKAGES & PATCHES</i> > <i>By Category</i> > <i>SAP TECHNOLOGY COMPONENTS</i> > <i>SAPCAR</i>. 2. Make the <code>SAPEXE.SAR</code> archive available on the installation host. Either download it as described in Downloading SAP Kernel Archives (Archive-Based Installation) [page 94] or take it from the kernel media, where this archive is contained in the folder <code>K_<Kernel_Version>_<U/N>_<OS>/DBINDEP</code>. 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>

3.3.2.3 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.

Software Requirements

Requirement	Values and Activities
	<p>SAP ASE 16.0 FOR BUS.SUITE</p> <p>The database software is automatically installed by the software provisioning manager.</p> <p>Check the Product Availability Matrix (PAM) at http://support.sap.com/pam for supported database platforms.</p>

Requirement**Values and Activities****AIX:** Operating system version

Your operating system platform must be 64-bit.

Check the Product Availability Matrix (PAM) at <http://support.sap.com/pam> for supported operating system versions.

Contact your OS vendor for the latest OS patches.

Minimal OS requirements for the specific SAP Kernel releases are listed in SAP Note [1780629](#).

You require at least AIX 7.1 TL1 SP1 to be able to run the software provisioning manager.

- **SAP ASE 16.0 for Bus.Suite**

AIX 7.2

AIX 7.1 TL1 SP1 and higher

To check the operating system version, enter the following command:

oslevel -s

Required SPs

AIX Level:	Required SP:	oslevel -s
AIX 7.1 TL 1	SP6	7100-01-06-1241
AIX 7.1 TL 2	SP2	7100-02-02-1316

AIX 7.1 requires a patch that fixes APARIV10828. Contact IBM directly to obtain the patch.

HP-UX: Operating system version

Your operating system platform must be 64-bit.

Check the Product Availability Matrix (PAM) at <http://support.sap.com/pam> for supported operating system versions.

To check the operating system version on your installation hosts, use the following command:

uname -r

See SAP Note [939891](#) for information about support time frames of HP-UX.

The following patches are required for HP-UX 11.31: PHSS_37493, PHSS_36352, PHKL_37802, PHKL_42687

Requirement	Values and Activities
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> <div style="border: 1px solid green; padding: 2px;"> <p>Only valid for 'Platform': Linux</p> <p>If you are installing on SUSE Linux Enterprise Server (SLES), see SAP Note 1275776 to prepare SLES for SAP environments.</p> <p>End of 'Platform': Linux</p> </div>
Linux Secure Enabled Linux (SELinux) Mode	<p>Set Linux Secure Enabled Linux (SELinux) SELinux mode to <i>Permissive</i> or <i>Disabled</i> on all SAP System hosts for the installation procedure. For more information, see SAP Note 3247790.</p>
Oracle 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>
SAP Kernel Releases and Versions	<p>To use regular software provisioning manager (SWPM10<Version>.SAR) with SAP kernel up to 7.53 on RHEL 6 or SLES 11 or Oracle Linux 6, you must install the required <code>libstdc++</code> RPM packages. For more information, see SAP Note 2195019.</p>
AIX: Kernel parameters	<p>To adjust the settings for asynchronous I/O if the database is installed using file systems, see SAP Note 1972803.</p> <p>To adjust AIX Virtual Memory Management settings, see SAP Note 973227.</p>

Requirement	Values and Activities
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 data-bbox="600 461 735 495" style="border-left: 2px solid orange; padding-left: 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 data-bbox="643 763 783 797" style="border-left: 2px solid orange; padding-left: 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).
Linux: Kernel parameters	<p>Check SAP Note 2369910 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"> • SLES 15: SAP Note 2578899 • SLES 12: SAP Note 1984787 • RHEL8: SAP Note 2772999 • RHEL7: SAP Note 2002167 • RHEL6: SAP Note 1496410
Oracle Solaris: Kernel parameters	<p>To run an SAP system, you must check and, if necessary, modify the Oracle Solaris kernel parameters or resource controls.</p> <ul style="list-style-type: none"> • Oracle Solaris 10: SAP Note 724713 • Oracle Solaris 11: SAP Note 1797712
HP-UX: OS patches	<p>To check the minimum required OS patches, see SAP Note 837670.</p>
Oracle Solaris: OS patches	<p>Check the relevant SAP Note for required Oracle Solaris patches:</p> <ul style="list-style-type: none"> • Sun Solaris 10 on SPARC: SAP Note 832871 • Oracle Solaris 11: SAP Note 1797712

Requirement	Values and Activities
AIX: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding locales are installed.</p>
HP-UX: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding locales 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 NLS-AUX . . . Enter the following commands to check which locales are available: <code>locale -a</code> The following files must be available: de_DE.iso88591, en_US.iso88591.
Linux: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding locales are installed.</p> <p>You can check this as follows:</p> <ul style="list-style-type: none"> Ensure that the required locales such as the following are available: <code>de_DE, en_US</code> Check SAP Note 187864 for information about corrected operating system locales and SAP <code>blended Code Pages</code>.
Oracle Solaris: National Language Support (NLS)	<p>Make sure that National Language Support (NLS) and corresponding locales are installed.</p> <p>Enter the following command to check which locales are available:</p> <code>locale -a</code> <p>The following locale must be available: en_US.ISO8859-1</p>
System language	<p>For the installation, you must choose English as the operating system language on all hosts that run SAP software.</p>

3.3.2.4 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.

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 software provisioning manager's SL-UI:</p> <ul style="list-style-type: none">• Microsoft Internet Explorer 11 or higher• Microsoft Edge• Mozilla Firefox• Google Chrome <p>Always use the latest version of these web browsers.</p> <p>You need a web browser to be able to run the SL-UI, and to display the Evaluation Form and send it to SAP.</p>
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
Host name	<p>To find out physical host names, open a command prompt and enter hostname.</p> <p>For more information about the allowed host name length and characters allowed for SAP system instance hosts, see SAP Note 611361.</p> <div style="border: 1px solid green; padding: 2px;"><p>Only valid for 'Platform': HP-UX</p></div> <p>For HP-UX, see SAP Note 1503149 in addition.</p> <div style="border: 1px solid green; padding: 2px;"><p>End of 'Platform': HP-UX</p></div> <p>If you want to use virtual host names, see SAP Note 962955.</p>

Requirement	Values and Activities
Login shell	<p>The software provisioning manager only prompts you for this parameter if you use a login shell other than 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>. End of 'Platform': AIX
HP-UX: Mount and file system configuration	For recommendations about block size and mount option configuration, see SAP Note 1077887 .
Shared file systems for decentralized systems	If application servers are installed decentralized, a "shared" file system must be installed, for example Network File System (NFS).
AIX: C++ Runtime environment	Minimal C++ runtime requirements for the specific SAP Kernel releases are listed in SAP Note 1780629 .

3.4 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:

- The database of AS Java.
- An external ABAP system as the data source for user data
- An LDAP directory as the data source for user data

i Note

If you want to install an Advanced Adapter Engine Extended (AEX), you can only use the database of AS Java for the user management. After the installation has finished, you cannot change the user management configuration.

You cannot configure the AS Java to simultaneously access an LDAP directory and an AS ABAP as the data source. The AS Java can also use its own database as the data source.

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 \[page 109\]](#).

More Information

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

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none">• SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4 http://help.sap.com/nw74• SAP NetWeaver 7.5 http://help.sap.com/nw75	<p>▶ Application Help ▶ SAP NetWeaver Library: Function-Oriented View ▶ Security ▶ Identity Management ▶ User Management of SAP NetWeaver AS for Java</p>

3.5 Basic Installation Parameters

The software provisioning manager 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 software provisioning manager 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
 - JCE Unlimited Strength Jurisdiction Policy files archive (only prompted if you install Adobe Document Services)
 - SAP system profile directory – only for systems with instances on separate hosts
 - User Management Engine (UME) Configuration

i Note

If you want to install an optional standalone unit - Advanced Adapter Engine (AAE), Advanced Adapter Engine Extended (AEX), or Process Integration and Orchestration (PI-CP) - you are **not** prompted for UME Configuration. Instead, optional standalone units are automatically configured to store the SAP system users in the Java database (see also section *User Management Engine Parameters* in [SAP System Parameters \[page 52\]](#)).

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.

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 tool help on the software provisioning manager screens.

Related Information

[SAP System Parameters \[page 52\]](#)

[SAP System Database Parameters \[page 62\]](#)

[Additional Parameters when Installing SAP Process Integration 7.5 or SAP Solution Manager 7.2 \[page 63\]](#)

[Additional Parameters When Using a Stack XML File \[page 63\]](#)

[Parameters for Additional Components to be Included in the SCS Instance \[page 63\]](#)

3.5.1 SAP System Parameters

The tables in this section lists the basic SAP system installation parameters that you need to specify before installing your SAP system. For all other installation parameters, use the tool help on the software provisioning manager screens.

General Parameters

Parameter	Description
Unicode System	A Java standalone system is always a Unicode system.

Parameter	Description
SAP System ID <SAPSID>	<p>The SAP system ID (<SAPSID>) identifies the entire SAP system.</p> <p>The software provisioning manager 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 software provisioning manager 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 data-bbox="405 629 557 665" data-label="Section-Header"> <h4>❖ Example</h4> </div> <p>This prompt appears when you install the SCS instance, which is the first instance to be installed in a distributed system.</p> <div data-bbox="405 797 547 831" data-label="Section-Header"> <h4>⚠ Caution</h4> </div> <p>Choose your SAP system ID carefully since renaming requires considerable effort.</p> <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. <div data-bbox="448 1057 603 1090" data-label="Section-Header"> <h4>❖ Example</h4> </div> <p>If you have already installed an ABAP system and you want to install a new Java system on the same host, make sure that you enter a <SAPSID> that is different from the <SAPSID> of the existing ABAP system. The <SAPSID> of a Java stack can only be equal to the <SAPSID> of an ABAP stack if they form a dual-stack system.</p> <p>Dual stack is no longer supported in SAP systems based on SAP NetWeaver 7.5 or higher.</p> <ul style="list-style-type: none"> • 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
SAP System Instance Numbers	<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 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 76].</p> <p>Only valid for 'Platform': AIX</p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f0f0f0;"> <p>⚠ Caution</p> <p>AIX only: If you are using NIM Service Handler (NIMSH), do not use 01 or 02 for the instance number. The software provisioning manager uses the instance number for the internal message server port <code>39<Instance Number></code>. 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="border: 1px solid #ccc; padding: 5px; background-color: #f0f0f0;"> <p>⚠ Caution</p> <p>HP-UX only: Do not use 75 for the instance number because this number is already used by the operating system. For more information, see SAP Note 29972.</p> </div> <p>End of 'Platform': HP-UX</p>
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 assign a virtual host name for the instance to be installed, by specifying it in the <code><Instance Name> Host Name</code> field of the <code><Instance Name> Instance</code> screen. Then this instance is installed with this virtual host name. Alternatively you can assign virtual host names also by starting the software provisioning manager with the <code>SAPINST_USE_HOSTNAME</code> property. For more information, see Running Software Provisioning Manager [page 113]. <p>After the installation has completed, all application servers can use this virtual host name to connect to the instance. If you do not provide the virtual host name, the instance is installed automatically using the physical host name of the host where you run the software provisioning manager.</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 software provisioning manager. For more information, see Using Virtual Host Names [page 84].</p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f0f0f0;"> <p>i Note</p> <p>Fully qualified host names, IPv4, IPv6 are not accepted as virtual host names.</p> </div>

Parameter	Description
SAP System Profile Directory	<p><code><sapmnt>/<SAPSID>/profile</code> if you want to install the primary application server instance of the</p> <p>or <code>/usr/sap/<SAPSID>/SYS/profile</code></p> <p>The software provisioning manager 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 software provisioning manager 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="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p>⚠ Caution</p> <p>If you did not create the operating system users manually before the installation, the software provisioning manager 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"> Java users (for example <code>Administrator</code>) Secure Store key phrase SAP systems based on SAP NetWeaver lower than 7.4: For more information, see line <i>Key Phrase for Secure Store Settings</i> in this table. <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p>⚠ Caution</p> <p>The software provisioning manager applies the master password to users <code>SAP*</code> and <code>DDIC</code> for SAP system clients 000 and 001 only, but not to users <code>SAP*</code>, <code>DDIC</code>, and <code>EARLYWATCH</code> in SAP system client 066.</p> <p>Instead, the software provisioning manager always assigns the following passwords to these users in client 066:</p> <p><code>SAP*:</code> 06071992</p> <p><code>EARLYWATCH:</code> support</p> <p>See also <i>Ensuring User Security</i>.</p> </div> <p>Basic Password policy</p> <p>The master password must meet the following requirements:</p> <ul style="list-style-type: none"> It can be 8 to 30 characters long It must contain at least one letter (a-z, A-Z) It must contain at least one digit (0-9) It must not contain <code>\</code> (backslash) or <code>"</code> (double quote). <p>Additional restrictions depending on SAP Adaptive Server Enterprise:</p> <ul style="list-style-type: none"> It must be at least 6 characters long It can only contain the following characters: <code>a-z, A-Z, 0-9, <space>, !#\$%&'()*+,-./:;<=>?@[]^_`{ }~</code> <p>Depending on the installation option, additional restrictions may apply.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p>❖ Example</p> <p>The master password must not contain the name of a Java user created during the installation).</p> </div>

Parameter	Description
	<p>→ Recommendation</p> <p>The Master Password feature can be used as a simple method to obtain customer-specific passwords for all newly created users. A basic security rule is not to have identical passwords for different users. Following this rule, we strongly recommend individualizing the values of these passwords after the installation is complete.</p> <p>For more information, see Ensuring User Security [page 150].</p>
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> <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> <p>For more information, see the information about <code>ms/ac1_info</code> in SAP Notes 1495075 and 826779.</p>
Java(TM) Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files Archive	<p>If you want to install <i>Adobe Document Services</i>, make sure that you download the unlimited version of the JCE Jurisdiction Policy Files archive. For more information about where to download it, see SAP Note 1240081.</p>
Key Phrase for Secure Store Settings	<p>This is a random word or phrase that is used to encrypt the secure store.</p> <p>The Java EE engine uses this phrase to generate the key that is used to encrypt the data.</p> <p>The uniqueness of the phrase you use contributes to the uniqueness of the resulting key.</p> <p>→ Recommendation</p> <p>Use a long key phrase that cannot be guessed easily. Use both uppercase and lowercase letters in the phrase and include special characters.</p> <p>i Note</p> <p>If you choose <i>Typical</i> mode, the software provisioning manager sets the master password for the key phrase. In this case, make sure that you replace the master password with the required unique key phrase either on the <i>Parameter Summary</i> screen or after the installation has finished.</p>

Parameter	Description
DNS Domain Name for SAP System	<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> <pre><Host_Name>.<Domain_Name></pre> <p>The DNS Domain Name is needed to define the URLs for the Java application servers. It is appended to the server name to calculate the FQDN.</p> <p>For more information, see SAP Note 654982.</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <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>

SAP Host Agent Upgrade (Optional)	<p>If there already exists an SAP Host Agent on the installation host, the software provisioning manager asks you if you want to upgrade it to a newer patch level version. If you want the existing version to be upgraded, you must provide the new target version of the <code>SAPHOSTAGENT<Version>.SAR</code> archive.</p> <p>For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 94]</p>
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Ports

Parameter	Description
Java Message Server Port	<div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <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>The SCS instance profile contains the configuration for the Java message server.</p> <p>The Java message server port uses the parameter <code>rdisp/msserv_internal</code> with default value <code>39<SCS_Instance_Number></code>.</p> <p>For more information about the parameters used for message server ports, see SAP Note 821875.</p>

Operating System Users

Parameter	Definition
Operating System Users and Groups	<p>The software provisioning manager processes the operating system users as follows:</p> <ul style="list-style-type: none">• If the operating system users do not exist, the software provisioning manager creates the following users:<ul style="list-style-type: none">• The SAP system administrator user <code><sapsid>adm</code>• Database administrator users <p>The software provisioning manager 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> <ul style="list-style-type: none">• If the operating system users already exist, the software provisioning manager 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>The <code>sapinst_instdir</code> directory belongs to a group named <code>sapinst</code>. If this group is not available, it is created automatically as a local group. For security reasons, we recommend removing the operating system users from the group <code>sapinst</code> after the execution of the software provisioning manager has completed.</p> <p>During the <i>Define Parameters</i> phase of the software provisioning manager, you can specify that the operating system users are to be removed automatically from the group <code>sapinst</code> after the execution of the software provisioning manager has completed.</p> <p>For more information about the group <code>sapinst</code>, see Creating Operating System Users and Groups [page 71].</p> <p>For more information about the <code>sapinst_instdir</code> directory, see Useful Information about Software Provisioning Manager [page 120].</p>

User Management Engine Parameters

Parameter	Definition
Using the Java Database:	
Administrator User	<p>The software provisioning manager sets the user name <code>Administrator</code> and the master password by default.</p> <p>If required, you can choose another user name and password according to your requirements.</p>
Guest User	<p>The software provisioning manager sets the user name <code>Guest</code> and the master password by default.</p> <p>The guest user is a user for anonymous access.</p>

Parameter	Definition
Using an External ABAP System – Parameters for the ABAP Connection:	
Application Server Instance Number	<p>This is the instance number on the application server of the central ABAP system to which you want to connect the Application Server Java.</p> <p>To find out the number on the host of the primary application server instance, look in the following SAP directory:</p> <ul style="list-style-type: none"> SAP systems based on SAP NetWeaver 7.4 (SAP Solution Manager 7.2 SR2 only) : <code>/usr/sap/<SAPSID>/DVEBMGS<Instance_Number></code> SAP systems based on SAP NetWeaver 7.5: <code>/usr/sap/<SAPSID>/D<Instance_Number></code>
Application Server Host	<p>This is the host name of the relevant application server instance.</p> <p>To find out the host name, enter hostname at the command prompt of the host running the primary application server instance.</p>
Communication User	<p>This is the name and password of the existing ABAP communication user. You must have created this user manually on the external ABAP system.</p> <p>The default user name is <code>SAPJSE</code></p> <div style="border: 1px solid #ccc; background-color: #f9f9f9; padding: 10px; margin-top: 10px;"> <p>i Note</p> <p>If you are installing a SAP NetWeaver 7.5 Process Integration (PI) or a SAP Solution Manager 7.2 system, this user has been created during the installation of the SAP NetWeaver 7.5 PI application server ABAP.</p> </div>
Using an External ABAP System – Parameters for the Application Server Java Connection:	
Administrator User	<p>This is the name and password of the administrator user that you created on the external ABAP system.</p> <p>The default user name is <code>J2EE_ADMIN</code></p> <div style="border: 1px solid #ccc; background-color: #f9f9f9; padding: 10px; margin-top: 10px;"> <p>i Note</p> <p>If you are installing a SAP NetWeaver 7.5 Process Integration (PI) or a SAP Solution Manager 7.2 system, this user has been created during the installation of the Application Server ABAP.</p> </div>

Parameter	Definition
Administrator Role	The role <code>SAP_J2EE_ADMIN</code> must exist on the external ABAP system.
Guest User	<p>This is the name and password of the guest user that you created on the external ABAP system.</p> <p>The guest user is a user for anonymous access.</p> <p>The default user name is <code>J2EE_GUEST</code></p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p>i Note</p> <p>If you are installing a SAP NetWeaver 7.5 Process Integration (PI) or an SAP Solution Manager 7.2 system, this user has been created during the installation of the Application Server ABAP.</p> </div>
Guest Role	The role <code>SAP_J2EE_GUEST</code> must exist on the external ABAP system.

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>HTTP port of the SAP system based on AS Java on which the System Landscape Directory (SLD) resides. The following naming convention applies:</p> <p>5<Primary_Application_Server_Instance_Number>00.</p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p>❁ Example</p> <p>If the primary application server instance number of the AS Java on which the System Landscape Directory (SLD) resides is 01, the SLD HTTP Port is 50100.</p> </div>

Parameter	Definition
SLD Data Supplier User and password	The existing SLD Data Supplier user and password of the existing SLD

3.5.2 SAP System Database Parameters

Parameters	Description
Database ID <DBSID>	<p>The <DBSID> identifies the database instance. The software provisioning manager prompts you for the <DBSID> when you are installing the database instance.</p> <p>The <DBSID> must be the same as the <SAPSID>.</p> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 10px; margin-top: 10px;"> <p>⚠ Caution</p> <p>Choose your database ID carefully. Renaming is difficult and requires you to reinstall the SAP system.</p> <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. </div>
Java Database User (SAPSR3DB)	The user name corresponds to the owner of the database tables.
Database user for database system administration (sapsa)	This is the default user for database monitoring and administration.
Database user for database system security tasks (sapss0)	This is the default user for security relevant tasks such as user creation and password setup.

3.5.3 Additional Parameters when Installing SAP Process Integration 7.5 or SAP Solution Manager 7.2

The parameters in this section are only required if you want to install SAP Process Integration 7.5 or SAP Solution Manager 7.2.

Parameter	Description
When Using a Stack XML File: SAP System ID <SAPSID>	When Installation Using a Stack XML File [page 33] , in addition to the requirements listed in using a stack configuration file [page 52] ▶▶ General Parameters ▶ SAP System ID ▶ , make sure that the SAP system ID (SAPSID) of the ABAP system must be different from the SAPSID of the Java system.

3.5.4 Additional Parameters When Using a Stack XML File

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

Parameter	Description
SAP Process Integration (PI) 7.5, SAP Solution Manager 7.2: SAP System ID <SAPSID>	In addition to the requirements listed in SAP System Parameters [page 52] ▶▶ General Parameters ▶ SAP System ID ▶ , make sure that the SAP system ID (SAPSID) of the ABAP system must be different from the SAPSID of the Java system.

For more information, see [Installation Using a Stack XML File \(Optional\) \[page 33\]](#).

Related Information

[Installation Using a Stack XML File \[page 33\]](#)

3.5.5 Parameters for Additional Components to be Included in the SCS Instance

You only need to specify the following parameters during the SCS instance installation if you perform an embedded installation of additional components.

Parameters	Description
Install an SAP Web Dispatcher embedded in the SCS instance	<p>When processing the screens for the ASCS instance installation, you are prompted to mark this checkbox on the screen <i>Additional Components to be Included in the SCS Instance</i>.</p> <p>If you mark the checkbox for SAP Web Dispatcher, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens:</p>
	<p>Message Server Host</p> <p>The name of the host on which the message server is located (profile parameter <code>rdisp/mshost</code>)</p>
	<p>Message Server HTTP Port</p> <p>HTTP port of the message server (profile parameter <code>ms/server_port_<xx></code>)</p>
	<p>Password for the Internet Communication Management (ICM) user</p> <p>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 software provisioning manager.</p> <p>You have to assign a password for this user.</p>

Related Information

[SCS Instance with Embedded SAP Web Dispatcher \[page 29\]](#)

3.6 Setup of Database Layout

i Note

The following sections apply especially to the installation of a production system.

When you plan your SAP system installation, it is essential to consider the setup of your database layout with regard to the distribution of SAP directories or database file systems to disks. The distribution depends on your specific environment and you must take factors into consideration, such as storage consumption of the software components involved, safety requirements and expected workload.

Required File Systems for SAP ASE

To ensure that your SAP system performs well in a production environment, you have to create separate file systems manually for the directories listed in the following table before you start the software provisioning

manager. The file systems must have the permission value 750, the owner `syb<dbSID>`, and the group `sapsys`.

The software provisioning manager creates the file systems, user, group and permissions automatically, if the directories have not been created before the installation.

During the installation of your SAP system, you can specify the number and names of the `sapdata` directories. The software provisioning manager allows to place several data or log devices in one `sapdata` or `saplog` folder. You can create additional `sapdata` and `saplog` directories before you start the software provisioning manager.

The following table lists the file systems that are required by the SAP ASE database:

File System / Logical Volume:	Description:
<code>/sybase/<DBSID></code>	SAP ASE software (<code>\$SYBASE</code>) Size: at least 6 GB
<code>/sybase/<DBSID>/sybssystem</code>	Location for devices <code>master.dat</code> , <code>sybmgmt.db.dat</code> , <code>sybsysdb.dat</code> , <code>sysprocs.dat</code> Size: at least 1 GB
<code>/sybase/<DBSID>/sybtemp</code>	Location for device <code>tempdb</code> Size: at least 4 GB
<code>/sybase/<DBSID>/saptemp</code>	Location for device <code>saptempdb</code> Size: at least 6 GB
<code>/sybase/<DBSID>/sapdiag</code>	Location for devices containing the database <code>saptools</code> . Size: at least 5 GB
<code>/sybase/<DBSID>/sapdata_<n></code>	Location for devices containing data For more information, see SAP Note 1748888 .
<code>/sybase/<DBSID>/saplog_<n></code>	Location for devices containing logs For more information, see SAP Note 1748888 .
<code>/sybase/<DBSID>/sybsecurity</code>	Location for devices containing the database <code>sybsecurity</code> Size: at least 1 GB for monitoring SAP ASE configuration changes For advanced SAP ASE audit options, you must adapt the size according to the enabled options and the workload of your system. You can place the devices containing the optional database <code>sybsecurityarchive</code> at this location. For more information, see SAP ASE 16.0: Auditing with SAP Adaptive Server Enterprise [page 159] .

For information about SAP file systems, see [SAP Directories \[page 76\]](#).

3.7 SAP System Transport Host

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 software provisioning manager creates during the installation of the SAP system by default on the global host.
The software provisioning manager 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 \[page 106\]](#).

More Information

- [Required File Systems and Directories \[page 76\]](#)

3.8 Planning the Switchover Cluster for High Availability

This section describes basic aspects of planning the switchover cluster for a high-availability system.

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 *SAP High Availability* pages at <https://wiki.scn.sap.com/wiki/display/SI/SAP+High+Availability>. They contain crucial information about high-availability cluster certification and certified high-availability partners.
- The ERS instance is essential for a high-availability system. You need one ERS instance for the Java SCS installed in your system.

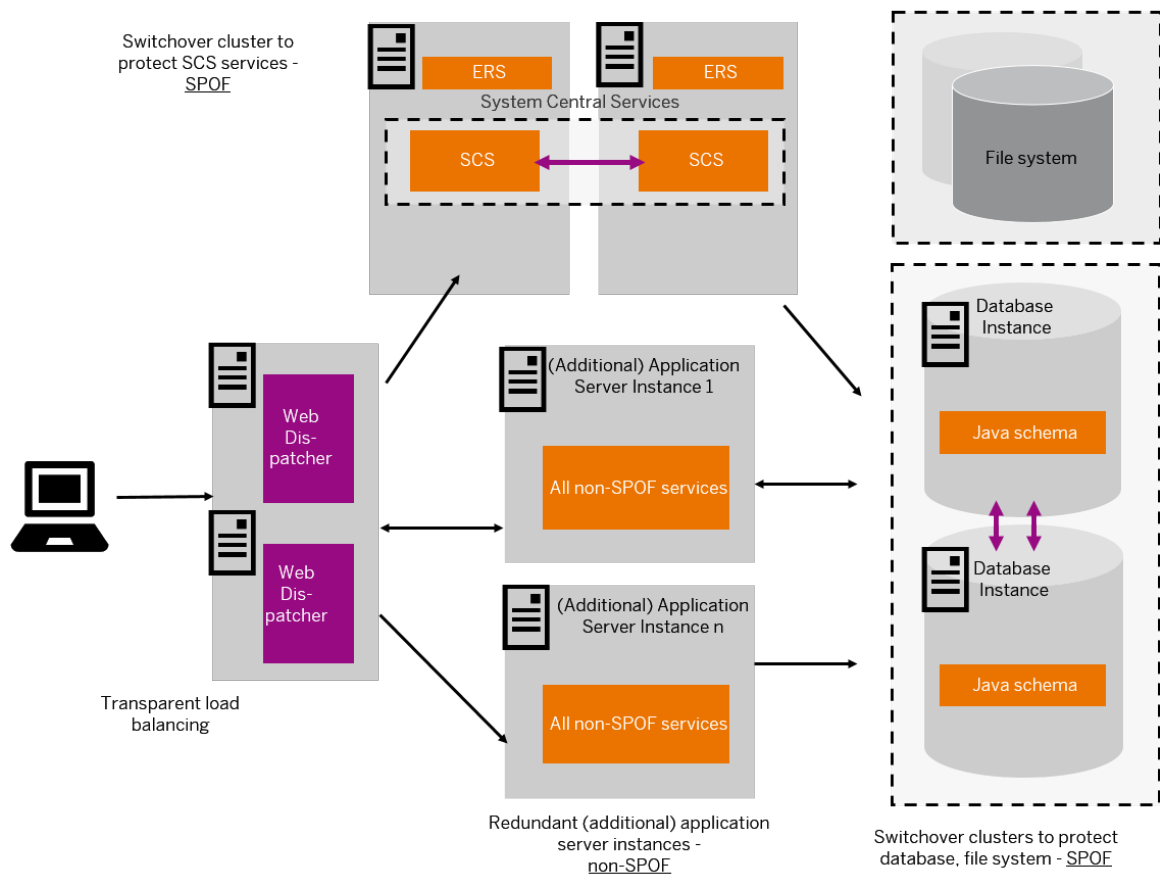
Features

i Note

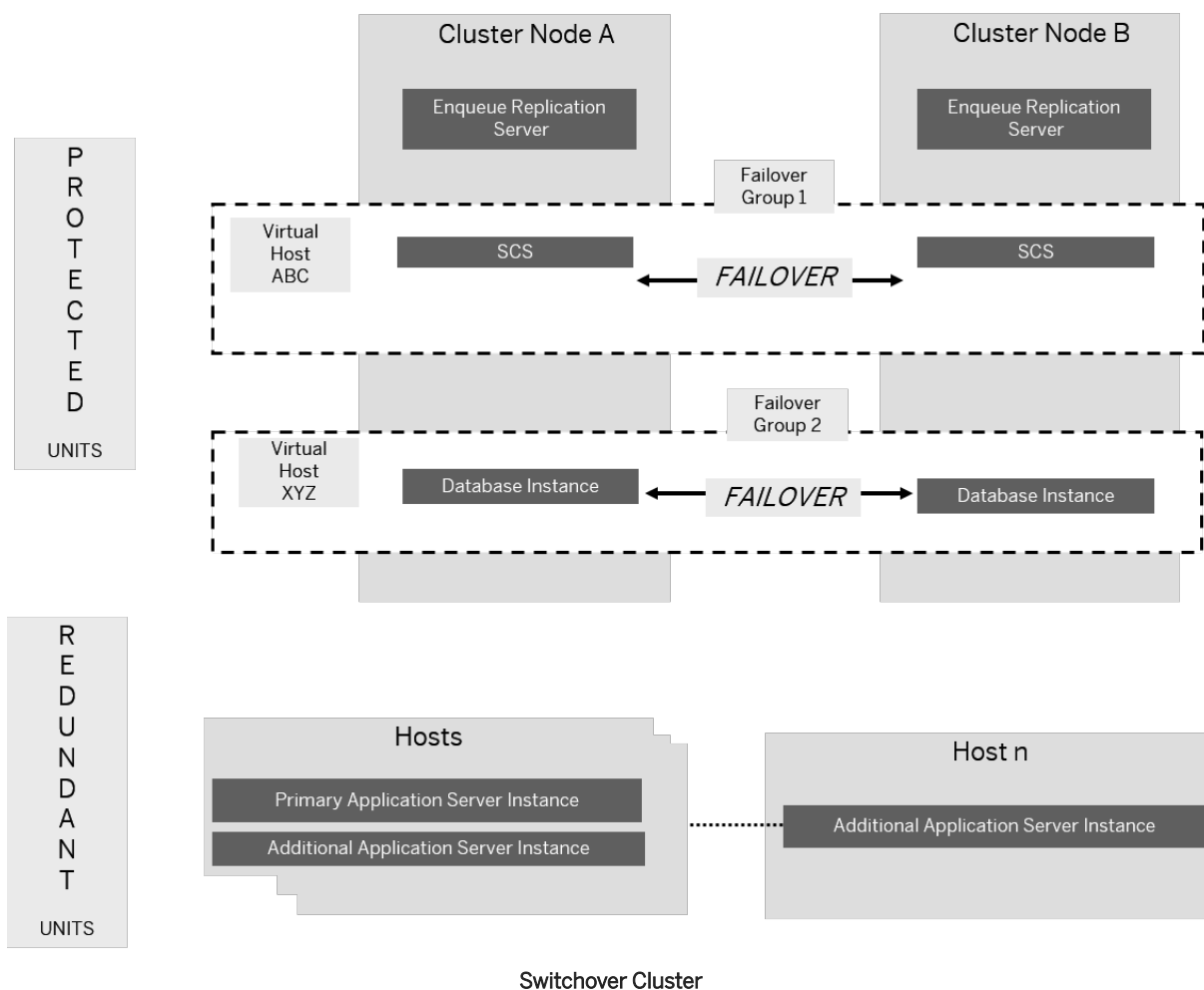
The diagrams in this section are only **examples**. Only the instances relevant to the switchover are shown.

These diagrams summarize the overall setup and do not show the exact constellation for an installation based on one of the available technologies.

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



Switchover Setup



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.

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 are available in the linked sections.

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 [Creating Operating System Users and Groups \[page 71\]](#) are created.
2. You [operating systemset up file systems \[page 76\]](#) 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 \[page 84\]](#).
Alternatively you can specify a virtual host name either in the command to start the software provisioning manager or - after the software provisioning manager has started - in the relevant field on the respective instance screen (see [Running Software Provisioning Manager \[page 113\]](#)).
4. If you want to install a high-availability system, you [perform switchover preparations \[page 85\]](#).
5. If you want to share the transport directory `TRANS` from another system, [export \[page 106\]](#) this directory to your installation hosts.
6. You check that the required [installation media \[page 88\]](#) are available for each installation host.
7. If you decided to use a generic LDAP directory, you have to [create a user for LDAP directory access \[page 178\]](#).
8. You continue with [Installation \[page 101\]](#).

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 \[page 71\]](#) are created.

2. You [set up file systems \[page 76\]](#) 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 \[page 84\]](#).
Alternatively you can specify a virtual host name either in the command to start the software provisioning manager or - after the software provisioning manager has started - in the relevant field on the respective instance screen (see [Running Software Provisioning Manager \[page 113\]](#)).
4. If you want to share the transport directory `trans` from another system, [export \[page 106\]](#) this directory to your installation hosts.
5. You check that the required [installation media \[page 88\]](#) are available on each installation host.
6. You continue with [Installation \[page 101\]](#).

4.2 Creating Operating System Users and Groups

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

The `sapinst_instdir` directory belongs to a group named `sapinst`. If this group is not available, it is created automatically as a local group.

If you do not want the software provisioning manager to create operating system 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).

For distributed installations, unless you are using global accounts or NIS, you must create the target users automatically using the software provisioning manager or manually on the operating system, before starting the installation :

⚠ Caution

The user ID (UID) and group ID (GID) of SAP users and groups must be identical for all servers belonging to an SAP system.

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

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

→ Recommendation

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

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 software provisioning manager and choose ► *Generic Installation Options* ► <Database> ► *Preparation* ► *Operating System Users and Groups* ► .
For more information, see [Running Software Provisioning Manager \[page 113\]](#).
- You create operating system users and groups manually. Check the settings for these operating system users.

User Settings

- Only valid for 'Platform': Oracle Solaris
Oracle Solaris: If your operating system is Oracle Solaris 10 or higher, follow the parameter recommendations for SAP applications in SAP Note [724713](#) .
End of 'Platform': Oracle Solaris
- Only valid for 'Platform': AIX
AIX: Make sure that you have set the limits for operating system users as described in SAP Note [323816](#) .
End of 'Platform': AIX
- Only valid for 'Platform': HP-UX, Linux, Oracle Solaris
HP-UX, Oracle Solaris: Make sure that you have set the limits listed below for operating system users root, <sapsid>adm, and your database-specific operating system users .
Linux: Starting with SUSE Linux Enterprise Server 15, Red Hat Enterprise Linux 8, and Oracle Linux 8, and the respective SAP kernel patch levels, native support for the software suite systemd for Linux is available for SAP systems. If you use Linux with systemd, ignore the following procedures for setting limits because there's no need to change the limits. Make sure that polkit is installed. systemd requires polkit for authorization checks for the <sapsid>adm user. For more information about Linux with systemd, see SAP Note [3139184](#) .
If you are still using a Linux version or an SAP kernel patch that is not released for native systemd support with SAP systems (see [3139184](#)), proceed as follows: Make sure that you have set the limits as outlined below for operating system users root, <sapsid>adm, and your database-specific operating system users .

⚠ Caution

Caution: the `limit` mechanism supports hard and soft limits. The soft limit cannot be bigger than the hard limit. The hard limit can be set/increased by the root user like: `limit -h <limit> <new_value>`, for example `limit -h datasize unlimited` .

- Using `ssh` shell, the output of command `limit` needs to be at least as follows:

❖ Example

The following table lists example output taken from SUSE Linux Enterprise Server 11 (x86_64).

Output	Properties
cputime	unlimited
filesize	unlimited
datasize	unlimited
stacksize	8192 KB
coredumpsize	unlimited
descriptors	8192
memoryuse	unlimited

- Using `sh` or `ksh` shell, the output of command `ulimit -a` needs to be at least as follows:

❖ Example

The following table lists example output taken from SUSE Linux Enterprise Server 11 (x86_64).

Output sh	Output ksh	Properties
cpu time (seconds)	cpu time (seconds)	unlimited
file size (blocks)	file size (blocks)	unlimited
data seg size (kbytes)	data size (Kibytes)	unlimited
stack size (kbytes)	stack size (Kibytes)	8192 KB
core file size (blocks)	core file size (blocks)	unlimited
open files	nofile	8192
max memory size (kbytes)	max memory size (Kibytes)	unlimited

End of 'Platform': HP-UX, Linux, Oracle Solaris

- 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 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 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 software provisioning manager, 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 `/` or `/usr/sap`.
- Only valid for 'Platform': HP-UX
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 software provisioning manager 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.

You can specify the name of the Java connect user (`sap<sapsid>db`) independently from the SAP schema name during the dialog phase of the software provisioning manager.

→ Recommendation

For security reasons, we recommend that you remove the operating system users from the group `sapinst` **after** the software provisioning manager has completed. For more information, see [Ensuring User Security \[page 150\]](#).

We recommend that you specify this “cleanup” already during the *Define Parameters* phase on the *Cleanup Operating System Users* screen. Then, the removal of the operating system users from the group `sapinst` is done automatically. For more information, see *Cleanup of Operating System Users* in [SAP System Parameters \[page 52\]](#).

Users and Groups

User:	Primary Group:
UNIX superuser root	No primary group assigned by SAPinst (group <i>sapinst</i> is assigned as secondary group).
SAP system administrator <sapsid>adm	<i>sapsys</i> (<i>sapinst</i> as secondary group)
syb<dbsid>	<i>sapsys</i>

SAP Host Agent:

User and Groups of the SAP Host Agent

User	Primary Group	Additional Group	Comment
sapadm	sapsys	-	SAP Host Agent administrator

i Note

If `sapadm` does not exist, it is created during the SAP Host Agent installation using `/bin/false` shell.

Make sure that `/bin/false` can be used as a login shell.

Only valid for 'Platform': AIX

AIX: Add `/bin/false` to the list of valid login shells (attribute `shells`) in `/etc/security/login.cfg`.

End of 'Platform': AIX

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.

Related Information

[SAP Directories \[page 76\]](#)

[Setting Up File Systems for a High-Availability System \[page 80\]](#)

4.3.1 SAP Directories

Depending on the installation option you have chosen, the software provisioning manager 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 software provisioning manager creates the following types of directories:

- Physically shared directories
- Logically shared directories
- Local directories

Only valid for 'Platform': HP-UX

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

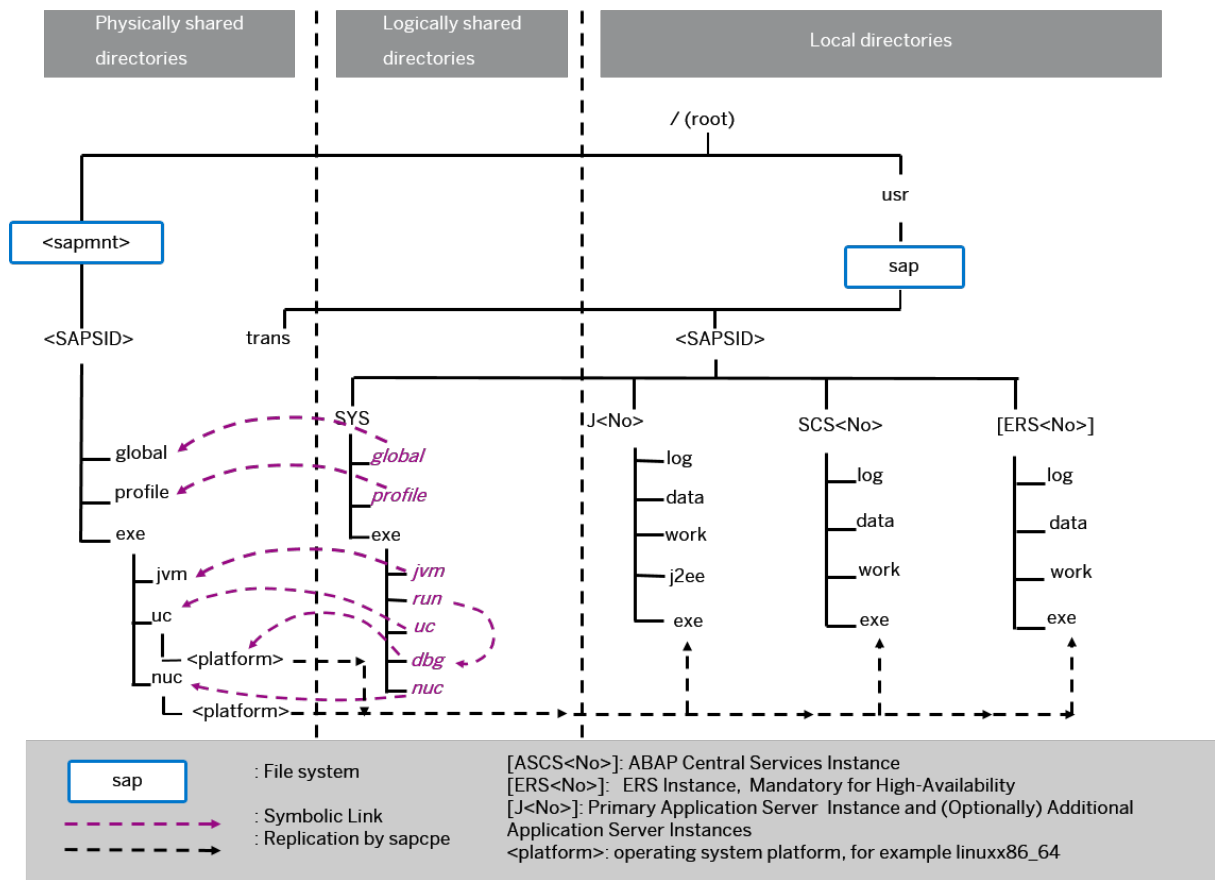
End of 'Platform': HP-UX

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 software provisioning manager creates all directories in the root directory (`/`). A high-availability setup might influence the file system structure. Contact your HA partner for their recommendation. For more information, see [Setting Up File Systems for a High-Availability System \[page 80\]](#).

The software provisioning manager prompts you only for the `<sapmnt>` directory during the installation.

The following figure shows the directory structure of the SAP system:



Directory Structure for a Java System

A Java standalone system is always a Unicode system (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 software provisioning manager 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 `trans`, which is the global transport directory. `/<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 software provisioning manager creates the following shared subdirectories in `/<sapmnt>/<SAPSID>`, which is the 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 \[page 107\]](#)):

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

- `exe`
Contains executable kernel programs. The kernel programs are replicated from directory `<sapmnt>/<SAPSID>/exe/uc/<platform>` to the `exe` directories of each Unicode system instance.
- The directory `/usr/sap/trans`
The `/usr/sap/trans` directory is physically separated from the server directories. This is to ensure that the ability of the server to run is not affected if the `/usr/sap/trans` directory is full.
If you want to use an existing transport directory, you have to mount it before you install the relevant application server instance. Otherwise, the software provisioning manager creates `/usr/sap/trans` locally.

→ Recommendation

We recommend that you set up your global transport directory as a shared file system.

For more information about the global transport directory, see [Exporting and Mounting the Global Transport Directory \[page 106\]](#).

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 software provisioning manager 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`

i Note

Although a Java system is Unicode only, the `nuc` folder and symbolic link still exist for historical reasons.

- 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 software provisioning manager 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 software provisioning manager 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.

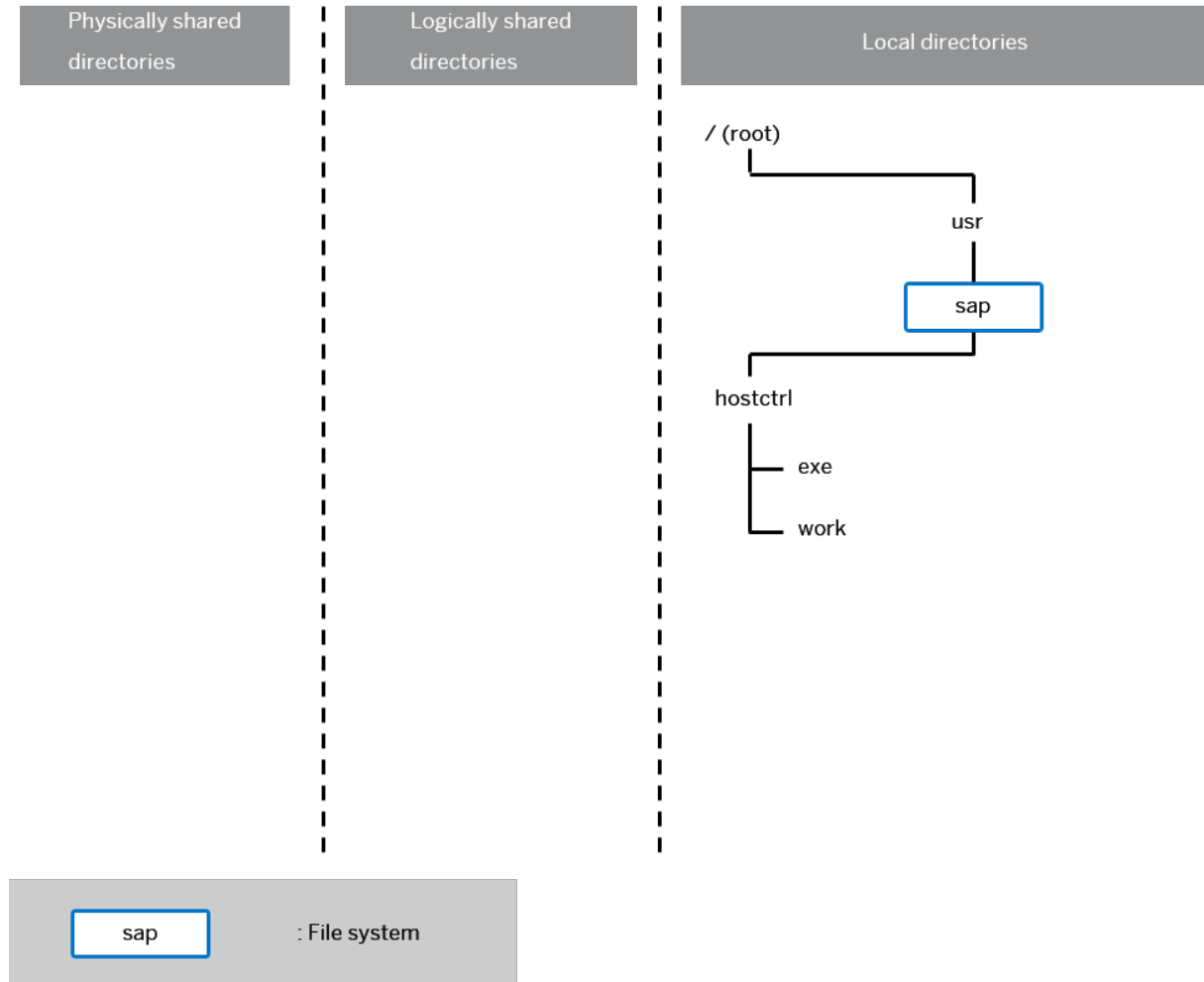
- Instance-specific directories with the following names:
 - The directory of an application server instance (primary application server instance and additional application server instance) is called `J<Instance_Number>`.
 - The directory of the central services instance (SCS) instance is called `SCS<Instance_Number>`.
 - The directory of an ERS instance is called `ERS<Instance_Number>`.
If you install a high-availability system, you must install an ERS instance for the SCS instance

Local SAP Directories

Directory	Description	Required Minimum Disk Space
<code>/usr/sap/<SAPSID>/J<Instance Number></code>	Application server instance directory (primary application server instance or additional application server instance)	Minimum 5 GB for the AS Java + up to 2 GB for each additional "product instance" you want to install
<code>/usr/sap/<SAPSID>/SCS<Instance Number></code>	Java central services instance (SCS instance) directory	Minimum 2 GB
<code>/usr/sap/<SAPSID>/ERS<Instance Number></code>	ERS instance directory for the SCS instance (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:



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 Setting Up File Systems for a High-Availability System

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.

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 \[page 66\]](#) and contact your HA partner.

Context

From the perspective of an SAP application, there are the following types of [SAP Directories \[page 76\]](#):

- Physically shared directories: `<sapmnt>/<SAPSID>` and `/usr/sap/trans`
In an HA setup, `<sapmnt>` should be a highly available file system, and `/usr/sap/trans` should be a shared file system.
- 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`In an HA Setup, no special actions are required for these local directories.
- Local directories that contain the SAP instances, such as `/usr/sap/<SAPSID>/SCS<Instance Number>`
In an HA setup, the directories of the clustered instances (`/usr/sap/<SAPSID>/<Instance Type><Instance Number>`) should be mounted as cluster-controlled file systems and reside on highly available file systems.

Only valid for 'Platform': HP-UX

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

End of 'Platform': HP-UX

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 central services (SCS) instance and the ERS 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). Especially for `<sapmnt>/<SAPSID>` you should think of using a highly available file system. However, an SAP instance directory `/usr/sap/<SAPSID>/<Instance Type><Instance`

`Number` that you want to prepare for HA must always be mounted on the cluster node that is currently running the instance.

⚠ 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.
- 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 \[page 76\]](#)):

- `SYS/sapmnt/<SAPSID>`
- `<Instance Type> <Instance Number>` – where the name is defined by the type of services and the application server number:
 - `J<Instance Number>` – which contains data of an application server instance
 - `SCS<Instance Number>` – which contains data for the Java central services instance
 - `ERS<Instance Number>` – which contains the replication table, which is a copy of the lock table.

Only `<Instance Type><Instance Number>` directories of clustered instances need to be migrated with the SAP instances during the switchover.

Create cluster-controlled file systems for `/usr/sap/<SAPSID>/<Instance Type><Instance Number>` of clustered instances.

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

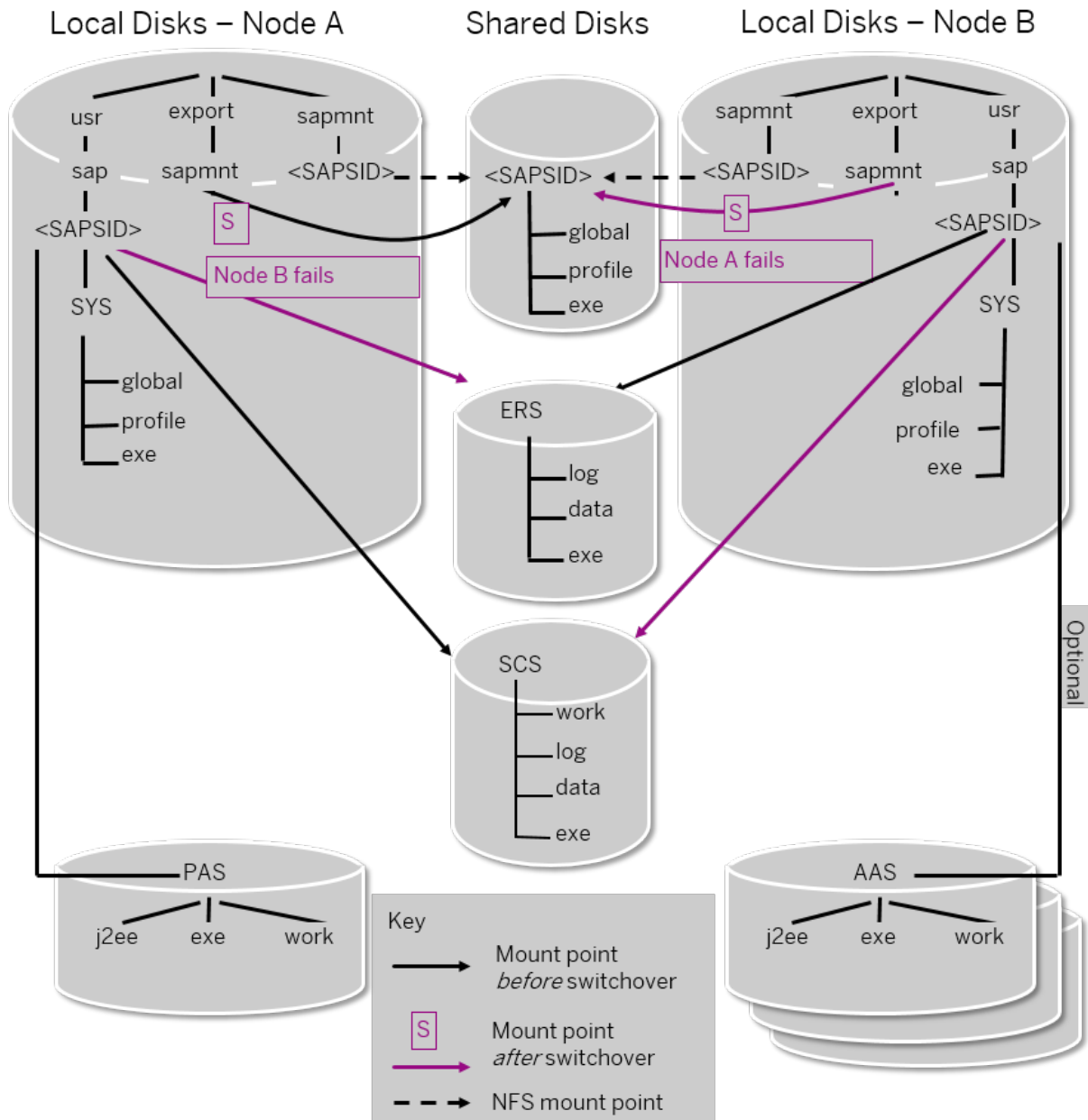
i Note

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 ERS instance and additional Java application server instances. The result is a more efficient use of resources. Use this approach for integrated installations of the application server with 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 a scenario of the file systems and disks in an HA setup with an integrated NFS server. Such a setup is not mandatory. For more information about a setup that meets your needs, consult your HA partner.



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.

Prerequisites

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

Context

If you want to install a [high-availability \(HA\) system \[page 25\]](#), you need the virtual host name when you install the SCS instance in a cluster.

Procedure

Assign the required virtual host names to the instance to be installed by specifying them in one of the following ways:

- By starting the software provisioning manager with the `SAPINST_USE_HOSTNAME` property. For more information, see [Running Software Provisioning Manager \[page 113\]](#).
- Alternatively by specifying virtual host names in the `<Instance Name> Host Name` field of the `<Instance Name> Instance` screen.

For more information, see the *Virtual Host Name* parameter description in [SAP System Parameters \[page 52\]](#) and SAP Note [962955](#).

4.5 Performing Switchover Preparations for High Availability

You have to assign virtual host names to prepare the switchover for high-availability.

Context

To be able to use the required [virtual host names \[page 84\]](#), you must set the software provisioning manager property `SAPINST_USE_HOSTNAME` to specify the required virtual host name. You can do this in one of the following ways:

- By starting the software provisioning manager with the `SAPINST_USE_HOSTNAME` property. For more information, see [Running Software Provisioning Manager \[page 113\]](#).
- Alternatively by specifying virtual host names in the `<Instance Name> Host Name` field of the `<Instance Name> Instance` screen.

For more information, see *Virtual Host Name* in [SAP System Parameters \[page 52\]](#).

Procedure

Assign the virtual IP addresses and host names for the SCS 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.

4.6 Preparing an External ABAP System as Source for User Data

You can use an external ABAP system as the data source for user data for the Application Server Java of your SAP Java system to be installed. To do so, you configure the User Management Engine (UME) of the AS Java for the user management of this external ABAP system.

Prerequisites

The ABAP system is based on at least SAP Web AS ABAP release 6.20 SP25.

Context

i Note

If you want to install an optional standalone unit - Advanced Adapter Engine (AAE) , Advanced Adapter Engine Extended (AEX), or Process Integration and Orchestration (PI-CP) - you can skip this section because you are **not** prompted for UME Configuration. Optional standalone units are automatically configured during the installation to store the SAP system users in the Java database.

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

i Note

If you want to install the application server Java for an **SAP NetWeaver 7.5 Process Integration (PI)** system or for an **SAP Solution Manager 7.2** system, you must use the already installed Application Server ABAP (AS ABAP) as the data source for user data for the Application Server Java to be installed. In this case, the required users were already created during the installation of the Application Server ABAP and you are prompted to enter these users during the installation of the Application Server Java.

You can take one of the following approaches when using an external ABAP system as source for user data:

Approach	Advantages	Disadvantages
Each Java system uses different users	No interdependencies between the connected engines	Initially more administration to create the users in the ABAP system
All Java systems use the same configuration	You create the users only once and enter the same information for every Java system that you install.	Interdependencies between the connected engines: <ul style="list-style-type: none">• If you change the password of any of the users on the ABAP system, this change affects all connected engines.• If you change the administrator user's password, you must also change the password in secure storage on all of the connected Java EE Engines

→ Recommendation

For security reasons, we recommend the **first** approach.

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

More Information

For more information about AS ABAP user management as data source, see the SAP Library at:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">• SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4 http://help.sap.com/nw74• SAP NetWeaver 7.5 http://help.sap.com/nw75• SAP NetWeaver AS for ABAP 7.51 innovation package https://help.sap.com/nw751abap• SAP NetWeaver AS for ABAP 7.52 https://help.sap.com/nw752abap	<p>▶ <i>Application Help</i> ▶ <i>SAP NetWeaver Library: Function-Oriented View</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>User Management of SAP NetWeaver AS for Java</i></p> <p>▶ <i>Configuring User Management</i> ▶ <i>UME Data Sources</i> ▶ <i>User Management of Application Server ABAP as Data Source</i> ▶</p>

Procedure

- The following procedures describe the activities you have to perform in the existing ABAP system and for the Java system to be installed.
- Perform the following steps in the existing ABAP system:
 - a. Call transaction `PF03` to do the following:
 - Check that the roles `SAP_BC_JSF_COMMUNICATION` and `SAP_BC_JSF_COMMUNICATION_RO` exist and make sure that their profiles are generated.
 - Check that the roles `SAP_J2EE_ADMIN`, `SAP_J2EE_GUEST`, and `SAP_BC_FP_ICF` exist. Neither role contains any ABAP permissions, so you do not need to generate any profiles.
 - b. Call transaction `SU01` to do the following:
 - Create a new communication user and assign it to the role `SAP_BC_JSF_COMMUNICATION_RO`. We recommend that you do the following:
 - Name this user `SAPJSF`. You can use any password.
 - Assign this user the role `SAP_BC_JSF_COMMUNICATION_RO` for read-only (display) access to user data with Java tools. If you intend to maintain user data (that is, to change, create, or delete users) with Java tools, you need to assign the role `SAP_BC_JSF_COMMUNICATION` instead.
 - Assign this user the type *Communications* under *Logon data* to make sure that it can only be used for communication connections between systems and not as a dialog user.
 - Create a new administrator user for the J2EE engine and assign it to role `SAP_J2EE_ADMIN`. We recommend that you name this user `J2EE_ADM_<SAPSID_Java_System>`. You can use any password.
 - Create a new guest user for the J2EE engine and assign it to role `SAP_J2EE_GUEST`. We recommend that you name this user `J2EE_GST_<SAPSID_Java_System>`. You can use any password.
Since this user is only used for anonymous access to the system, we recommend you to deactivate the password and, if required, lock it after installation to prevent anyone from using it for explicit named logons.

- c. Make sure that you change the initial passwords of these users and take the precautions described in the relevant SAP security guide **before** you start the installation of the Java system. You can find the security guide in the *Security* section of the product page for your SAP product at <https://help.sap.com/>.
- Perform the following steps in the Java System:
 - a. **Before** the installation of the Java system, make sure that you have the correct user names and passwords of the users listed above for the separate ABAP system.
 - b. **During** the installation of the Java system, make sure that you enter the correct users and passwords in the corresponding software provisioning manager dialogs.

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 software provisioning manager software. You always have to download the latest version of the software provisioning manager 1.0 archive. For more information, see [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#).
- The media containing the software to be installed. These are the following:

- Kernel media:

You can make them available in one of the following ways:

- Make yourself familiar with current SAP Kernel releases and SAP's Kernel strategy:

Central SAP Notes

[2083594](#) - SAP Kernel Versions and SAP Kernel Patch Levels

[3116151](#) - SP Stack Kernel Schedule Forecast

[1744209](#) - SAP Kernel 720, 721 and 722: Versions and Kernel Patch Levels

[1969546](#) - Release Roadmap for Kernel 74x and 75x

[1802333](#) - Finding information about regressions in the SAP kernel

[19466](#) - Downloading SAP kernel patches

[2966761](#) - Overview of SAP Kernel Correction Archives

[2966621](#) - Overview of Kernel-Related Software Components

[953653](#) - Rolling Kernel Switch

- Download the **SAP Kernel Archives** (SAR files) from the SAP Software Download Center - this is the recommended way. For more information, see [Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 94\]](#). If you are performing an [Installation Using a Stack XML File \[page 33\]](#), you can directly download the artefacts (SAR archives) as specified in the Maintenance Plan.
- Use the physical installation media as part of the installation package.

For more information, see [Media Required for the Installation - Listed by SAP System Instance \[page 89\]](#).

- Download the complete kernel media from the SAP Software Download Center.
For more information, see [Downloading Complete Installation Media \[page 99\]](#).
- RDBMS and export media.
You can make them available in one of the following ways:

- Use the physical installation media as part of the installation package.
- Download the complete kernel media from the SAP Software Download Center.

For detailed information about how to obtain these media, see [Media Required for the Installation - Listed by SAP System Instance \[page 89\]](#).

[Media Required for the Installation - Listed by SAP System Instance \[page 89\]](#)

This section provides a list of the media required for the installation, listed by SAP system instance to be installed.

4.7.1 Media Required for the Installation - Listed by SAP System Instance

This section provides a list of the media required for the installation, listed by SAP system instance to be installed.

The digital signature of **installation media** is checked **automatically** by the software provisioning manager during the *Define Parameters* phase while the *Media Browser* screens are processed (see also [Running Software Provisioning Manager \[page 113\]](#)). The software provisioning manager only accepts media whose digital signature has been checked.

For more information about which kernel version to use, see the following information sources::

Central SAP Notes

[2083594](#) - SAP Kernel Versions and SAP Kernel Patch Levels

[3116151](#) - SP Stack Kernel Schedule Forecast

[1744209](#) - SAP Kernel 720, 721 and 722: Versions and Kernel Patch Levels

[1969546](#) - Release Roadmap for Kernel 74x and 75x

[1802333](#) - Finding information about regressions in the SAP kernel

[19466](#) - Downloading SAP kernel patches

[2966761](#) - Overview of SAP Kernel Correction Archives

[2966621](#) - Overview of Kernel-Related Software Components

[953653](#) - Rolling Kernel Switch

In addition, check the Product Availability Matrix at: <http://support.sap.com/pam>.

Proceed as follows to make the media available:

1. Identify the required media [for your installation \[page 23\]](#) as listed below.
Every installation of an SAP system on SAP Adaptive Server Enterprise is Unicode.

SAP Instance

Installation	Required Software Packages from Installation Media
Central services instance (SCS instance)	<ul style="list-style-type: none">• Software Provisioning Manager 1.0 archive• UC Kernel (folder κ_<Version>_ϖ_<OS>) where ϖ means Unicode.
Database instance	<ul style="list-style-type: none">• Software Provisioning Manager 1.0 archive• UC Kernel (folder κ_<Version>_ϖ_<OS>) where ϖ means Unicode.• Database software• SAP Business Suite Java Applications only: SAP Business Suite Java Content (folders JAVA_*)
Enqueue Replication Server	<ul style="list-style-type: none">• Software Provisioning Manager 1.0 archive• UC Kernel (folder κ_<Version>_ϖ_<OS>) where ϖ means Unicode.
Primary application server instance	<ul style="list-style-type: none">• Software Provisioning Manager 1.0 archive• UC Kernel (folder κ_<Version>_ϖ_<OS>) where ϖ means Unicode.• SAP NetWeaver AS for Java Component (folders JAVA_*)• SAP Business Suite Java Applications only: SAP Business Suite Java Content (folders JAVA_*)• Database Client Software
Additional application server instance	<ul style="list-style-type: none">• Software Provisioning Manager 1.0 archive• UC Kernel (folder κ_<Version>_ϖ_<OS>) where ϖ means Unicode.• SAP NetWeaver AS for Java Component (folders JAVA_*)• SAP Business Suite Java Applications only: SAP Business Suite Java Content (folders JAVA_*)• Database Client Software

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

2. Make the installation media available on each installation host as follows:
 1. Download and unpack the latest version of Software Provisioning Manager as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#).
 2. Make the kernel media available.

You can do this in one of the following ways:

 - Download the dedicated kernel archives - this is the recommended way.
For more information, see [Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 94\]](#).

i Note

If you are using a Stack XML file (see [Installation Using a Stack XML File \[page 33\]](#)), 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 <https://launchpad.support.sap.com/#/softwarecenter> where you can download the installation media required for your SAP product, operating system and database.

Using the software provisioning manager, you can also directly download the artefacts (SAR archives) as specified in the Maintenance Plan. For more information, see [Downloading Software Packages for a Maintenance Planner Transaction \[page 96\]](#).

- Use the physical kernel medium from the installation package.
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.

- Download the kernel medium from the Software Download Center.
For more information, see [Downloading Complete Installation Media \[page 99\]](#).

i Note

Even if you use the complete kernel media, the software provisioning manager 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 software provisioning manager 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 <https://launchpad.support.sap.com/#/softwarecenter> following the instructions in [Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 94\]](#).

i Note

If you perform an additional application server installation, kernel archives - such as SAPEXE<Version>.SAR, SAPEXEDB<Version>.SAR, IGSEXE<Version>.SAR, igshelper<version>.sar, SAPJVM<Version>.SAR - are only prompted if they cannot be retrieved from the primary application server instance or the SCS instance of the existing SAP system.

3. Make the RDBMS and export media. 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.

Related Information

[Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#)

[Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 94\]](#)

[Downloading Software Packages for a Maintenance Planner Transaction \[page 96\]](#)

[Downloading Complete Installation Media \[page 99\]](#)

4.7.1.1 Downloading and Extracting the Software Provisioning Manager 1.0 Archive

You must always download and extract the software provisioning manager 1.0 archive from the SAP Software Download Center because you must use the latest version.








Prerequisites

- Make sure that you are logged on as a user with `root` authorizations, and that the download directory has at least the permissions 755.
- Make sure that you use the **latest** version of the `SAPCAR` tool when manually extracting the software provisioning manager archive. You need the `SAPCAR` tool to be able to unpack and verify software component archives (*.SAR files). *.SAR is the format of software lifecycle media and tools that you can download from the SAP Software Download Center.

i Note

An older `SAPCAR` version might extract archive files in a wrong way and this could prevent the software provisioning manager from working consistently.

Proceed as follows to get the latest version of the `SAPCAR` tool:

1. Go to <https://launchpad.support.sap.com/#/softwarecenter>   **SUPPORT PACKAGES & PATCHES**  **By Category**  **SAP TECHNOLOGY COMPONENTS**  **SAPCAR** .
2. Select the `SAPCAR` for your operating system and download it to an empty directory.
3. Even if you have the latest `SAPCAR` already available, we strongly recommend that you verify its digital signature anyway, unless you downloaded it directly from <https://launchpad.support.sap.com/#/softwarecenter>  yourself. You can do this by verifying the checksum of the downloaded `SAPCAR` tool:
 1. Depending on what operating system you are using, compute a hash of the downloaded `SAPCAR` tool, using the SHA-256 algorithm used by SAP.
 2. Now verify the digital signature of the downloaded `SAPCAR` tool by comparing the hash with the checksum (generated by SAP using the SHA-256 algorithm) from the *Content Info* button in the *Related Info* column on the right-hand side of the place where you downloaded the `SAPCAR` tool.
4. To improve usability, we recommend that you rename the executable to `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:

<https://support.sap.com/sltoolset> >> System Provisioning > Download Software Provisioning Manager >

2. Using the latest version of SAPCAR, you can verify the digital signature of the downloaded SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive as follows:
 - a. Get the latest version of the SAPCRYPTOLIB archive to your installation host as follows:
 1. Go to <https://launchpad.support.sap.com/#/softwarecenter> SUPPORT PACKAGES & PATCHES and search for "sapcryptolib".
 2. Select the archive file for your operating system and download it to the same directory where you have put the SAPCAR executable.
 3. Use the following command to extract the SAPCRYPTOLIB archive to the same directory where you have put the SAPCAR executable:
SAPCAR -xvf sapcryptolib_84...sar -R <target directory>
 4. Download the Certificate Revocation List from <https://tcs.mysap.com/crl/crlbag.p7s> and move it to the same directory.
 - b. Verify the digital signature of the downloaded SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive by executing the following command:

i Note

Check SAP Notes [2178665](#) and [1680045](#) whether additional information is available.

```
./<Path to SAPCAR>/SAPCAR -tvvf <Path to Download Directory>/  
SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -crl<file name of  
revocation list>
```

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

```
./<Path to SAPCAR>/sapcar -xvf <Path to Download Directory>/  
SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -R <Path to Unpack  
Directory>
```

i Note

Make sure that all users have at least read permissions for the directory to which you unpack the Software Provisioning Manager archive.

⚠ 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.

4.7.1.2 Downloading SAP Kernel Archives (Archive-Based Installation)

Instead of downloading the complete SAP kernel media, we recommend that you download the SAP kernel archives specifically required for your installation option. 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.

i Note

If you are performing an installation using a Stack XML file, you can use the service [Downloading Software Packages for a Maintenance Planner Transaction \[page 96\]](#).

Context

The digital signature of **installation archives** is checked **automatically** by the [software provisioning manager \[page 113\]](#) during the *Define Parameters* phase while processing the *Software Package Browser* screens. The software provisioning manager only accepts archives whose digital signature has been checked. After scanning the archives and verifying the digital signature, an info file is written where you can find detailed information about matching and non-matching archive files. You can access this info file by choosing the *info file* link in the Archive Scanning Result section of the *Software Package Browser* screen. The info file contains only the results of the latest archive scan.

Procedure

1. Download and unpack the latest version of software provisioning manager as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#).
2. Make yourself familiar with current SAP Kernel releases and SAP's Kernel strategy:

Central SAP Notes

[2083594](#) - SAP Kernel Versions and SAP Kernel Patch Levels

[3116151](#) - SP Stack Kernel Schedule Forecast

[1744209](#) - SAP Kernel 720, 721 and 722: Versions and Kernel Patch Levels

[1969546](#) - Release Roadmap for Kernel 74x and 75x

[1802333](#) - Finding information about regressions in the SAP kernel

[19466](#) - Downloading SAP kernel patches

[2966761](#) - Overview of SAP Kernel Correction Archives

[2966621](#) - Overview of Kernel-Related Software Components

[953653](#) - Rolling Kernel Switch

- To get all downloadable software component archives required for your SAP product, go to <https://launchpad.support.sap.com/#/softwarecenter> >>> [SUPPORT PACKAGES & PATCHES](#) > [By Category](#)

You can also search for dedicated software component archives by choosing >>> [SUPPORT PACKAGES & PATCHES](#) > [By Downloads](#) > [Search](#)

- Choose the required software component, release, and technical stack:
 - If you want to install SAP S/4HANA <Release> Java, choose >>> [SAP APPLICATION COMPONENTS](#) > [SAP S/4HANA](#) > [SAP S/4HANA <Release>](#) > [SAP S/4HANA JAVA](#)
 - If you want to install the Java part of an SAP Process Integration 7.5 system, choose >>> [SAP NetWeaver and complementary products](#) > [SAP NetWeaver](#) > <Release> > [Application Server Java](#)
 - If you want to install an optional standalone unit of SAP NetWeaver Process Integration 7.5 (Advanced Adapter Engine, Advanced Adapter Engine Extended, or Process Orchestration) choose >>> [SAP NetWeaver and complementary products](#) > [SAP NetWeaver](#) > <Release> > [Entry by Component](#) > [Application Server Java](#)
 - If you want to install an SAP NetWeaver Java system, choose >>> [SAP NetWeaver and complementary products](#) > [SAP NetWeaver](#) > <Release> > [\[For releases lower than 7.5: Entry by Component\]](#) > [Application Server Java](#)
 - 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](#) > <Java Product Instance>
- Choose the required package:

Note

If you perform an additional application server installation, kernel archives - such as SAPEXE<Version>.SAR, SAPEXEDB<Version>.SAR, IGSEXE<Version>.SAR, igshelper<version>.sar, SAPJVM<Version>.SAR - are only prompted if they cannot be retrieved from the primary application server instance or the SCS instance of the existing SAP system.

Caution

- Make sure that you always use the highest available patch level unless special patch levels are specified for the relevant package in SAP Note [1680045](#).
- 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 **64-BIT UNICODE**, then SAPEXEDB<Version>.SAR must also be of version **64-BIT UNICODE**.

- SAPEXE<Version>.SAR
>>> [SAP KERNEL <Version> <UC>](#) > <Operating System> > [#DATABASE INDEPENDENT](#)
- SAPEXEDB<Version>.SAR

Choose the version corresponding to the `SAP EXE<Version>.SAR` from `SAP KERNEL <Version><UC>><Operating System>><DATABASE>>`

- `igsex<Version>.sar`
`SAP IGS <Version>><Operating System>>`
- You require the `igs helper<Version>.sar`.
Choose `SAP IGS HELPER > # OS independent >`
- `SAP JVM<Version>.SAR`:
`SAP JVM 8.<Version>><Operating System>>`
- `SAP HOST AGENT<Version>.SAR`
`SAP HOST AGENT 7.22 >><Operating System>>`

→ Recommendation

It is highly recommended that you always choose the highest SP version of the `SAP HOST AGENT<SP-version>.SAR` archive.

i Note

The `SAP HOST AGENT<Version>.SAR` archive is only prompted if there is either no SAP Host Agent available on the installation host or you specified during the Define Parameters phase that you want to upgrade an existing version of the SAP Host Agent already available on the installation host. In the latter case, you must specify a higher version of the `SAP HOST AGENT<Version>.SAR`. Otherwise, the existing SAP Host Agent is not upgraded.

6. If you want to install *Adobe Document Services*, download the **unlimited** version of the JCE Jurisdiction Policy Files archive. For more information about where to download it, see SAP Note [1240081](#) (see also [SAP System Parameters \[page 52\]](#)).
7. Make the RDBMS and the export media available - either by using physical media as described in [Media Required for the Installation - Listed by SAP System Instance \[page 89\]](#) or by downloading them as described in [Downloading Complete Installation Media \[page 99\]](#).

Related Information

[Downloading Software Packages for a Maintenance Planner Transaction \[page 96\]](#)

4.7.1.3 Downloading Software Packages for a Maintenance Planner Transaction

The software provisioning manager is now enabled to download all software packages that have been defined in a Maintenance Planner Transaction.

i Note

This feature is only available if you perform an installation using a stack configuration file.

Prerequisites

Plan your new SAP system including the required Support Package level (applicable for SAP NetWeaver and S/4HANA) as available in the Maintenance Planner and run `sapinst SAPINST_STACK_XML=<Stack XML file>` in order to benefit from an automated installation process.

Procedure

1. Specify a download directory for the artifacts (SAP archives) to be downloaded.
2. Start the software provisioning manager as described in [Running Software Provisioning Manager \[page 113\]](#).
3. On the *Welcome* screen, choose **►► Generic Options ► Download Software Packages for Maintenance Planner Transaction** **►**
4. Follow the instructions on the software provisioning manager screens.

The software provisioning manager prompts you for the following input parameters:

- Maintenance Planner Transaction ID

You can find the Maintenance Planner Transaction ID by one of the following ways:

- In the `MP_Plan_<Transaction ID>_<Generation Date>_.pdf` file which you can download during the *Completed* step in the Maintenance Planner by choosing the *Download PDF* button.
- From the *Transaction ID* column in the list of transactions displayed in the *Transactions* panel in the maintenance planner.
- From the parameter `mopz-transaction-id` in the Stack XML file `MP_Stack_<Transaction ID>_<Generation Date>_ .xml` which you can download during the *Download Files* step in the Maintenance Planner by choosing the *Download Stack XML* button.

Note

If you started the software provisioning manager using a Stack XML file, the Maintenance Planner Transaction ID is only displayed.

- Your S-UserID and password

You call *Software Provisioning Manager* with command line parameter

`SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>` to get the *Maintenance Planner Transaction ID* extracted from the Stack XML file.

You must perform this option directly after creating the Maintenance Planner Transaction, because the contained download links usually expire soon.

Ensure the following for your *S-User*:

1. You have download permissions for all artifacts on <https://launchpad.support.sap.com/#/softwarecenter> to be able to download them.
2. Consider the SAP Support Portal and the SAP ONE Support Launchpad [password policies](#): Your **password must be the same** for both of them. If the passwords are not the same, you will lock the S-User in the SAP Support Portal. The **password must meet all of the following requirements**:
 - Must be **exactly** eight characters long
 - Contains at least one upper-case letter (A-Z)

- Contains at least one lower-case letter (a-z)
- Contains at least one decimal digit (0-9)
- Contains at least one of the following special characters: ! \ @ \$ % / ({ [] }) + - * = ? ' ~ # _ . , ; : < >
- Must not start with ? or !
- Must not contain any blanks
- Must not begin with three identical characters
- Must be different from the last five passwords you have already used
- Only one password change is allowed per day

If required, request a change of your SAP Support Portal Password **and** of your SAP ONE Support Password at <https://support.sap.com/en/my-support/users.html>.

- Location of download folder for the installation software packages to be downloaded
 - If you have a proxy configured in your network, provide the proxy host and port.
5. You get a list of all downloadable artifacts (SAP archives) as specified in the Stack XML file along with their file size.

You can still deselect downloadable artifacts (SAP archives) that you do not need to be downloaded.

6. Choose *Next* to start the download.

If you get a download error, this is the result of an unsuccessful network connection. Check your network connection and proxy configuration. If the download of some artifacts finishes without any error, but still with a status other than *OK*, you must do one of the following:

- Create an up-to-date Maintenance Plan and perform again the download of the files which were not downloaded successfully. In case of an error, the software provisioning manager skips the download of the artifact (SAR archive) in question and continue with the next one in the list.
- Download the still missing files directly from the SAP Software Center at <https://launchpad.support.sap.com/#/softwarecenter>.

Caution

If you install an SAP system based on SAP NetWeaver **7.5 Java**, follow the instructions in SAP Note [1680045](#) regarding the patch level of the `SAPJVM.SAR` archive you use for the installation.

Results

You have downloaded the artifacts (SAP archives) required for your SAP system installation with the software provisioning manager - corresponding to the archives listed in section [Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 94\]](#) - and for applying the required kernel and support packages using Software Update Manager (SUM) after the installation has completed.

SAP BW/4HANA 1.0 SR1 only: RDBMS and export **media** are **not** covered by this feature. You have to provide them either as physical media or download them from the SAP Software Center as described in [Downloading Complete Installation Media \[page 99\]](#).

4.7.1.4 Downloading Complete Installation Media

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

Procedure

1. Download and unpack the latest version of Software Provisioning Manager as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#).
2. Create a download directory on the host where you want to run the software provisioning manager.
3. You identify the required media as listed in [Media Required for the Installation - Listed by SAP System Instance \[page 89\]](#).
4. Identify **all** download objects that belong to one medium according to one 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:
 - To download the complete kernel media, go to <https://launchpad.support.sap.com/#/softwarecenter/> ► ► ► **SUPPORT PACKAGES & PATCHES** ► *By Category* ► **ADDITIONAL COMPONENTS** ► **SAP KERNEL** ► **SAP KERNEL 64-BIT UNICODE** ► **SAP KERNEL <version> 64-BIT UNICODE** ► *<Select your OS>* ►.
 - Select ► **#DATABASE INDEPENDENT** ► to download the database-independent parts of the kernel.

❖ Example

```
SAPEXE_1110-80002623.SAR
Kernel Part I (753) (*)
```

```
SAPEXE_1118-80002612.SAR
```

- Select ► *<Your DB>* ► to download the database-independent parts of the kernel.

❖ Example

```
SAPEXEDB_1110-80002623.SAR
Kernel Part II (753) (*)
```

i Note

You can only download complete kernel media for kernel release 7.22, which can only be used for provisioning of SAP products based on SAP NetWeaver 7.3 EHP1. For all remaining SAP products, you have to download kernel media from <https://launchpad.support.sap.com/#/softwarecenter/> as described in [Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 94\]](#).

- To download the remaining media required for your SAP product, you can use one of the following navigation paths:
 - <https://launchpad.support.sap.com/#/softwarecenter> **INSTALLATIONS & UPGRADES**
 - > *By Category* > **SAP NETWEAVER AND COMPLEMENTARY PRODUCTS** > <Product>
 - > <Product Release>
 - <https://launchpad.support.sap.com/#/softwarecenter> **INSTALLATIONS & UPGRADES**
 - > *By Alphabetical Index (A-Z)* > <First Letter of Product> > <Product> > <Product Release>
- Material number
All download objects that are part of an installation medium have the same material number and an individual sequence number:
<Kernelpart>_<Sequence Number>-<Material Number>

Example

```
SAPEXE_1110-80002623.SAR
Kernel Part I (753) (*)
SAPEXE_1111-80002623.SAR
Kernel Part I (753) (*)
SAPEXE_1112-80002623.SAR
Kernel Part I (753) (*)
```

Example

```
SAPEXEDB_1110-80002623.SAR
Kernel Part II (753) (*)
SAPEXEDB_1111-80002623.SAR
Kernel Part II (753) (*)
SAPEXEDB_1112-80002623.SAR
Kernel Part II (753) (*)
```

- Title
All objects that are part of an installation medium have the same title, such as
<Solution><Media_Name><OS> or <Database>RDBMS<OS> for database media.

- Download the objects to the download directory.
- 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 are available in the linked sections.

i Note

SAP ASE 16.0 is installed silently as part of the installation of the respective SAP product. Do not install the database software separately prior to the SAP installation.

Standard System

i Note

1. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the SAP system.

i Note

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

2. You continue with [Post-Installation \[page 134\]](#).

Distributed System

1. If you want to share the transport directory `trans` from another system, you have to [mount \[page 106\]](#) 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 **SCS instance host**, you do the following:
 1. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the central services instance (SCS instance).

i Note

If you want to install an SCS instance [with embedded SAP Web Dispatcher \[page 29\]](#) , you must choose the *Custom* parameter mode.

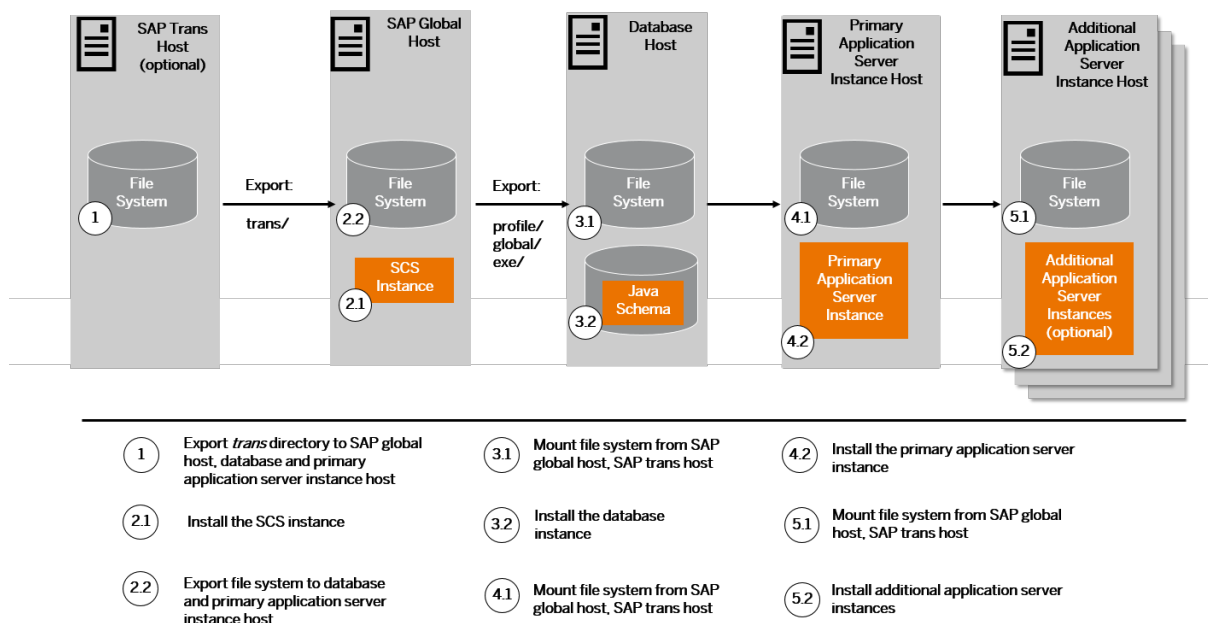
When processing the screens for the SCS instance installation, you are prompted to mark the corresponding checkbox on the screen *Additional Components to be Included in the SCS Instance*.

If you mark the checkbox for SAP Web Dispatcher, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

2. You [export global directories \[page 107\]](#) 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 \[page 107\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host and – optionally – the `trans` directory that you [exported \[page 106\]](#) from the SAP transport host.
 2. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the database instance.
4. On the **primary application server instance host**, you do the following:
 1. You [mount the global directories \[page 107\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
 2. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the primary application server instance.
 3. If you want to use the shared transport directory `trans` from another system, you also [mount \[page 106\]](#) this directory.
5. You continue with [Post-Installation \[page 134\]](#).

Graphical Overview

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



Distribution of Instances in a Java System

High-Availability System

i Note

The following procedure is only an example. In this example, we use only one primary cluster node, **host A**, and one standby cluster node, **host B**. However, for your production system, we recommend that you have more than one standby node.

- 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 \[page 85\]](#) and [Setting Up File Systems for a High Availability System \[page 80\]](#)
- If you want to share the transport directory `trans` from another system, you have to [mount \[page 106\]](#) 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).
- You set up the **switchover cluster infrastructure** as follows:
 - You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the SCS instance on the primary cluster node, **host A**. Use a [virtual host name \[page 84\]](#).

i Note

If you want to install an SCS instance [with embedded SAP Web Dispatcher \[page 29\]](#), you must choose the *Custom* parameter mode.

When processing the screens for the SCS instance installation, you are prompted to mark the corresponding checkbox on the screen *Additional Components to be Included in the SCS Instance*.

If you mark the checkbox for SAP Web Dispatcher, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

2. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the ERS instance for the SCS instance on the primary cluster node, **host A**. Use a [virtual host name \[page 84\]](#).
3. You [export global directories \[page 107\]](#) 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 \[page 35\]](#) and it has all the necessary [file systems \[page 80\]](#), 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, and OS specific files (such as `etc/services`) 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 \[page 71\]](#).

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 ERS instance on **all** nodes in the cluster:
 1. You perform the switchover to a node where you want to install the ERS instance for the SCS instance.
 2. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the ERS instance for the SCS 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 \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the database instance on the **database instance host**.
5. On the **primary application server instance host**, you do the following:

i Note

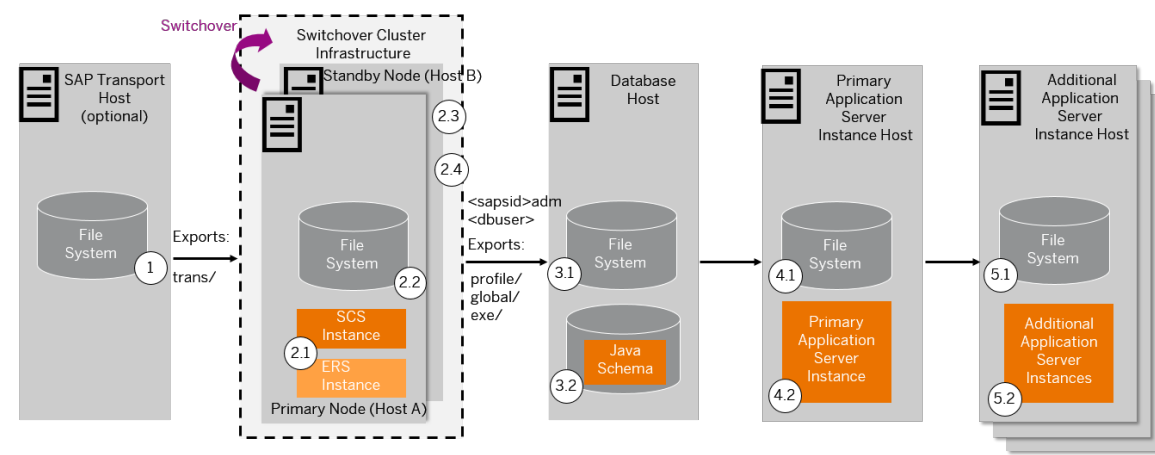
In a high-availability installation, the primary application server instance does **not** need to be part of the cluster because it is no longer a single point of failure (SPOF). The SPOF is now in the central services instance (SCS instance), which is protected by the cluster.

1. You [mount the global directories \[page 107\]](#) in `<sapmnt>/<SAPSID>` that you exported from the switchover cluster infrastructure.
2. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the primary application server instance.

- If you want to use the shared transport directory `trans` from another system, you also [mount \[page 106\]](#) this directory (see above).
- 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.
- You continue with [Post-Installation \[page 134\]](#).

Graphical Overview

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



- | | | |
|---|--|---|
| 1 Export <code>trans</code> directory to switchover cluster, database, and primary application server, and additional application server instance hosts | 2.4 If required, install ERS instance on standby node (host B) | 4.2 Install the primary application server instance |
| 2.1 Install SCS instance and related ERS instance on primary node (host A) | 3.1 Prepare mount points, file systems | 5.1 Mount global directories |
| 2.2 Export global directories | 3.2 Install database instance | 5.2 Install additional application server instances |
| 2.3 Prepare standby node (host B): Set up users and file systems | 4.1 Prepare mount points, file systems | |

Distribution of Instances in a High-Availability Java System

Additional Application Server Instance

- 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.
- On every **additional application server instance host**, you do the following:
 - If you want to install additional application server instances on a host different from the SAP system host, you [mount the global directories \[page 107\]](#) in `<sapmnt> / <SAPSID>` that you exported from the SAP system host.
 - You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the additional application server instance.
- You continue with [Post-Installation \[page 134\]](#).

Installation Steps for an Application Server Instance for a Distributed System

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.5 and SAP Solution Manager 7.2 SR2 Java of SAP NetWeaver 7.5 on UNIX: SAP Adaptive Server Enterprise

1. If you want to share the transport directory `trans` from another system, you have to [mount \[page 106\]](#) 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 \[page 107\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
 2. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the additional application server instance.
 3. If you want to use the shared transport directory `trans` from another system, also [mount \[page 106\]](#) this directory.
4. You continue with [Post-Installation \[page 134\]](#).

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 \[page 106\]](#) 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 \[page 107\]](#) in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
 2. You [check the prerequisites \[page 110\]](#) and [run the software provisioning manager \[page 113\]](#) to install the additional application server instance.
 3. If you want to use the shared transport directory `trans` from another system, you also [mount \[page 106\]](#) this directory.
4. You continue with [Post-Installation \[page 134\]](#).

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.

Context

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.

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

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.

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

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.

Context

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.

❖ Example

You install an optional standalone unit (Advanced Adapter Engine, Advanced Adapter Engine Extended, or Process Orchestration) distributed over several hosts. You decide that the host with the main instances (Java central services instance (SCS instance), primary application server instance, database instance) is the SAP global host. Before you install additional application server instances, you have to export the global directories from the SAP global host and mount them on the installation hosts for the remaining instances.

Choose one of the following ways to proceed, depending on whether you are performing a homogeneous or heterogeneous installation:

Procedure

- **Exporting and Mounting Global Directories for a Homogeneous Installation**

- a. 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
```

- b. Log on to the host of the new instance that you want to install as user `root`.
- c. 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.

- **Exporting and Mounting Global Directories for a Heterogeneous Installation**

With a heterogeneous installation, the instances of an SAP system are installed on hosts with **different UNIX operating systems**. If you need information about the installation of application servers on Windows in a UNIX environment, see [Heterogeneous SAP System Installations \[page 179\]](#).

i Note

Mounting the directories between different system types, for example mounting a Windows file system on a Linux host, requires a 3rd party product such as Samba. The installation and configuration of Samba is **not** covered by in this guide.

Proceed as follows for a heterogeneous installation with different UNIX operating systems:

- a. Log on to the SAP global host as user `root` and export the following directories with `root` access to the host on which you want to install the new instance:

```
<sapmnt>/<SAPSID>/exe
```

```
<sapmnt>/<SAPSID>/profile
```

```
<sapmnt>/<SAPSID>/global
```

- b. Log on to the host of the new instance as user `root`.
- c. 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 these mount points 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 \[page 50\]](#).

Procedure

Using the Database of AS Java

You install your SAP system as described in this installation guide. During the installation, you specify the Java database as data source for the User Management Engine (UME) (see [SAP System Parameters \[page 52\]](#)).

During the installation, the SAP system is automatically configured to use the Java database as data source for the UME.

After the installation has finished, you can still change the user management configuration. For more information, see [Configuring User Management \[page 149\]](#).

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 \[page 149\]](#).

5.5 Prerequisites for Running Software Provisioning Manager

Make sure you fulfil the following prerequisites before running the software provisioning manager.

- For the SL-UI, make sure that the following web browser requirements are met:
 - You have one of the following supported browsers on the device where you want to run the SL-UI:
 - Google Chrome (recommended)
 - Mozilla Firefox
 - Microsoft Edge
 - Microsoft Internet Explorer 11 or higher.Always use the latest version of these web browsers.
 - If you copy the SL-UI URL manually in the browser window, make sure that you open a new Web browser window in private browsing mode (Internet Explorer), incognito mode (Chrome) or private browsing mode (Firefox). This is to prevent Web browser plugins and settings from interfering with the SL-UI.

Caution


The software provisioning manager uses a self-signed certificate, which is used temporarily only while the software provisioning manager is running. This certificate is not trusted by the browser unless it is imported manually by the user running the software provisioning manager. This behavior is intentionally designed in this way because - unlike ordinary public web servers - the software provisioning manager has different usage patterns. You must configure your browser to trust the self-issued certificate of the software provisioning manager after carefully performing the “thumbprint” verification described in [Running Software Provisioning Manager \[page 113\]](#) . For more information about adding trusted certificates, see the documentation of your browser.

For more information about the SL-UI, see [Useful Information about Software Provisioning Manager \[page 120\]](#).

- If you want to enable Internet Protocol Version 6 (IPv6), make sure that you set `SAP_IPv6_ACTIVE=1` in the environment of the user with `root` authorization which you use to start the software provisioning manager. While running the software provisioning manager, this setting is then also added to the environment of the `<sapsid>adm` user.

Note

By applying this setting the SAP system administrator is responsible for configuring the IP version on each host of the system landscape, before installing any additional instance to it.

- The software provisioning manager uses shell scripts to obtain the environment for user `<sapsid>adm`.
 - If user `<sapsid>adm` does not yet exist, a working `/bin/csh` must be available on the host where you run the software provisioning manager. For more information about recommended login shells, see SAP Note [202227](#) .

- If `<sapsid>` already exists and uses `csch`, before you start the software provisioning manager, execute the following command as user `<sapsid>` to make sure that the `csch` scripts are up-to-date, depending on your UNIX OS platform:

```
/bin/csch -c "source /home/<sapsid>adm/.cschrc;env" or /bin/csch -c "source /home/<sapsid>adm/.login;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 `cron` entry.
Make sure that the temporary directory has the permissions `755`.
- Make sure that you have at least 700 MB of free space in the installation directory for each installation option. In addition, you need 700 MB free space for the software provisioning manager executables. If you cannot provide 700 MB free space in the temporary directory, you can set one of the environment variables `TEMP`, `TMP`, or `TMPDIR` to another directory with 700 MB free space for the software provisioning manager 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 Software Provisioning Manager \[page 120\]](#).

Note

Some tools such as `jspitter` may create files while the software provisioning manager is running. The required free space in the `/tmp` directory depends on the amount of databases which you intend to unload.

- Make sure that `umask` is set to `022` for the user with `root` permissions that you want to use for running the software provisioning manager.
As the user with `root` permissions that you want to use for running the software provisioning manager, enter the following command: `umask 022`

Only valid for 'Platform': AIX

AIX: Make sure that you have set the limits for operating system users as described in SAP Note [323816](#).

End of 'Platform': AIX

- Only valid for 'Platform': HP-UX, Linux, Oracle Solaris

Linux: On Linux, starting with SLES 15, RHEL 8 and Oracle Linux 8, and respective recent SAP kernel patch levels, there is native integration into `systemd`. In this case, limits for operating system users `root`, `<sapsid>adm`, and your database-specific operating system users do not need to be set any longer. Make sure that `polkit` is installed. `systemd` requires `polkit` for authorization checks for the `<sapsid>adm` user. For older Linux versions and SAP kernel patch levels, however, you must still set these limits. For more information about how to proceed for older Linux versions, see the following instructions. For more information about Linux with `systemd` and the relevant SAP kernel patch levels, see SAP Note [3139184](#).

HP-UX, Oracle-Solaris, Linux (versions lower than SLES 15, RHEL 8 and Oracle Linux 8 or lower SAP kernel patch levels): Make sure that you have set the limits for operating system users `root`, `<sapsid>adm`, and your database-specific operating system users (see also sections [Creating Operating System Users and Groups \[page 71\]](#) and [Running Software Provisioning Manager \[page 113\]](#)).

Caution

Caution: the `limit` mechanism supports hard- and soft-limits. The soft-limit cannot be bigger than the hard-limit. The hard-limit can be set/increased by the root user like: `limit -h <limit> <new_value>`, for example `limit -h datasize unlimited`.

- Using `cs` shell, the output of command `limit` needs to be at least as follows:

❖ Example

The following table lists example output taken from SUSE Linux Enterprise Server 15 (x86_64).

Output	Properties
<code>cputime</code>	unlimited
<code>filesize</code>	unlimited
<code>datasize</code>	unlimited
<code>stacksize</code>	8192 KB
<code>coredumpsize</code>	unlimited
<code>descriptors</code>	8192
<code>memoryuse</code>	unlimited

- Using `sh` or `ksh` shell, the output of command `ulimit -a` needs to be at least as follows:

❖ Example

The following table lists example output taken from SUSE Linux Enterprise Server 15 (x86_64).

Output sh	Output ksh	Properties
<code>cpu time (seconds)</code>	<code>cpu time (seconds)</code>	unlimited
<code>file size (blocks)</code>	<code>file size (blocks)</code>	unlimited
<code>data seg size (kbytes)</code>	<code>data size (Kibytes)</code>	unlimited
<code>stack size (kbytes)</code>	<code>stack size (Kibytes)</code>	8192 KB
<code>core file size (blocks)</code>	<code>core file size (blocks)</code>	unlimited
<code>open files</code>	<code>nofile</code>	8192
<code>max memory size (kbytes)</code>	<code>max memory size (Kibytes)</code>	unlimited

End of 'Platform': HP-UX, Linux, Oracle Solaris

- Make sure that you have defined the most important SAP system parameters as described in [Basic Installation Parameters \[page 51\]](#) **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 \[page 36\]](#).

- 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_J20_zsi-aiX693p2_D20081204`
to `/usr/sap/S14/SYS/profile/S14_J20_zsi-aiX693p2.D20081204`.

- Make sure that the following ports are not used by other processes:
 - Port 4237 is used by default as HTTPS port for communication between the software provisioning manager and the SL-UI.
If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:
`SAPINST_HTTPS_PORT=<Free Port Number>`
 - Port 4239 is used by default for displaying the feedback evaluation form at the end of the software provisioning manager 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=<Free Port Number>`
- If you want to perform the installation in unattended mode, see [System Provisioning Using an Input Parameter File \[page 122\]](#) which describes an improved procedure using `infile.params`.

5.6 Running Software Provisioning Manager

This section describes how to run the software provisioning manager.

Prerequisites

For more information, see [Prerequisites for Running Software Provisioning Manager \[page 110\]](#).

Context

The software provisioning manager has a web browser-based GUI named “SL-UI of the software provisioning manager” - “SL-UI” for short.

This procedure describes an installation where you run the software provisioning manager and use the SL-UI, that is you can control the processing of the software provisioning manager from a browser running on any device.

For more information about the SL-UI, see [Useful Information about Software Provisioning Manager \[page 120\]](#).

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 software provisioning manager has not set any environment variables for a different SAP system or database.

If your security policy requires that the person running the software provisioning manager is not allowed to know the credentials of a user with `root` permissions on the installation 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 must confirm that the user is a trusted one. For more information, see SAP Note [1745524](#).

2. Make the installation media available.

For more information, see [Preparing the Installation Media \[page 88\]](#).

i Note

Even if you use the complete SAP kernel media, the software provisioning manager 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.

<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 must download the required PL from <https://launchpad.support.sap.com/#/softwarecenter> following the instructions given in [Downloading SAP Kernel Archives \(Archive-Based Installation\) \[page 94\]](#).

→ Recommendation

Make the installation media available **locally**. For example: The software provisioning manager might require a certain PL. For example, if you use Network File System (NFS), reading from media mounted with NFS might fail.

Only valid for 'Platform': Oracle Solaris

i Note

Oracle Solaris: If you mount installation media, make sure that you do this with option `nomapcase`.

End of 'Platform': Oracle Solaris

3. Start the software provisioning manager from the directory to which you unpacked the Software Provisioning Manager archive by entering the following command:

```
<Path_To_Unpack_Directory>/sapinst
```

i Note

If you are using a Stack XML file (see [Installation Using a Stack XML File \[page 33\]](#)), you must call the `sapinst` executable with command line parameter

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

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

i Note

If you need to assign virtual host names to the instance to be installed, and it is **not possible** to do this (for example, for database instances) by specifying it as an input parameter on the `<Instance Name>` *Instance* screen, you can assign a virtual host name by starting the software provisioning manager with the `SAPINST_USE_HOSTNAME` property:

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

For more information, see *Virtual Host Name* in [SAP System Parameters \[page 52\]](#).

4. The software provisioning manager now starts and waits for the connection with the SL-UI.

You can find the URL you require to access the SL-UI at the bottom of the shell from which you are running the software provisioning manager.

```
...  
*****  
Open your browser and paste the following URL address to access the GUI  
https://[<hostname>]:4237/sapinst/docs/index.html  
Logon users: [<users>]  
*****  
...
```

i Note

If the host specified by `<hostname>` cannot be reached due to a special network configuration, proceed as follows:

1. Terminate the software provisioning manager as described in [Useful Information about Software Provisioning Manager \[page 120\]](#).
2. Restart the software provisioning manager from the command line with the `SAPINST_GUI_HOSTNAME=<hostname>` property.
You can use a fully-qualified host name.

If you have a supported web browser (see [Prerequisites for Running Software Provisioning Manager \[page 110\]](#)) installed on the host where you run the software provisioning manager, you can open this URL directly in the shell. Otherwise, open the URL in a supported web browser that runs on another device.

⚠ Caution

After opening the browser URL, make sure that the URL in the browser starts with "https://" to avoid security risks such as SSL stripping.

Before you reach the *Welcome* screen, your browser warns you that the certificate of the `sapinst` process on this computer could not be verified.

Proceed as follows to avoid security risks such as a man-in-the-middle attack:

1. Click on the certificate area on the left hand side in the address bar of your browser, and view the certificate.
2. Open the certificate fingerprint or thumbprint, and compare all hexadecimal numbers to the ones displayed in the console output of the software provisioning manager.

Proceed as follows to get the certificate fingerprint or thumbprint from the server certificate printed in the software provisioning manager console:

1. Go to the `sapinst_exe.xxxxxxx.xxxx` directory in the temporary directory to which the software provisioning manager has extracted itself:

```
<User_Home>/ .sapinst/
```

2. In the `sapinst_exe.xxxxxxx.xxxx` directory, execute the `sapgenpse` tool with the command line option `get_my_name -p`.

As a result, you get the server fingerprint or thumbprint from the server certificate.

3. Accept the warning to inform your browser that it can trust this site, even if the certificate could not be verified.

The SL-UI opens in the browser by displaying the *Welcome* screen.

5. On the *Welcome* screen, choose the required option:

- Perform preparations

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

To install SAP Host Agent separately, choose **Generic Options** > **<Database>** > **Preparations** > **SAP Host Agent**.

- To Install an SAP system or an optional standalone unit (Advanced Adapter Engine, Advanced Adapter Engine Extended, Partner Connectivity Kit, or Process Orchestration):

- To install an SAP system based on SAP NetWeaver AS Java **from scratch**, choose **<Product>** > **<Database>** > **Installation** > **Application Server Java** > **<System Variant>**.

- To install the application server Java for an SAP Process Integration system based on SAP NetWeaver 7.5 **from scratch**, choose **SAP NetWeaver 7.5** > **<Database>** > **Installation** > **Application Server Java for SAP Process Integration** > **<System Variant>**.

- To install the application server Java for an SAP Solution Manager 7.2 system **from scratch**, choose **SAP Solution Manager 7.2 <Support_Release>** > **Installation** > **<Database>** > **SAP System** > **Application Server Java** > **<System Variant>**.

- To install an optional standalone unit **from scratch**, choose **SAP NetWeaver <Release>** > **<Database>** > **Installation** > **Optional Standalone Units** > **<Advanced Adapter Engine | Advanced Adapter Engine Extended | Partner Connectivity Kit | Process Orchestration>** > **<System Variant>**.

- To install an SAP system based on SAP NetWeaver AS Java **as target system of a system copy**, choose **<Product>** > **<Database>** > **System Copy** > **Target System** > **<System_Variant>** > **Based on AS Java**.

- To install the application server Java for an SAP Process Integration system based on SAP NetWeaver 7.5 **as target system of a system copy**, choose **SAP NetWeaver 7.5** > **<Database>** > **System Copy** > **Target System** > **<System_Variant>** > **Based on AS Java**.

- To install the application server Java for an SAP Solution Manager 7.2 system **as target system of a system copy**, choose [▶ SAP Solution Manager 7.2 <Support_Release> ▶ <Database> ▶ System Copy ▶ Target System ▶ <System_Variant> ▶ Based on AS Java ▶](#).
- To install an optional standalone unit **as target system of a system copy**, choose [▶ SAP NetWeaver <Release> ▶ <Database> ▶ System Copy ▶ Target System ▶ <System_Variant> ▶ Based on AS Java ▶](#).
- Install an additional SAP system instance, go to [▶ <Product> ▶ <Database> ▶ Additional SAP System Instances ▶ Additional Application Server Instance ▶](#).

i Note

Options to install additional application server instances for **SAP Solution Manager 7.2 Java Support Release 2**:

[▶ SAP Solution Manager 7.2 Support Release 2 ▶ SAP Solution Manager 7.2 Java Support Release 2 ▶ <Database> ▶ Installation ▶ Additional SAP system instances \(SAP Solution Manager 7.2 Java below SP9\) ▶](#)

Use these options only for SAP Solution Manager 7.2 Java lower than SP09.

For SAP Solution Manager 7.2 Java SP09 or higher, use the options of SAP NetWeaver 7.5 Java:

[▶ SAP NetWeaver 7.5 ▶ <Database> ▶ Installation ▶ Application Server Java ▶ Additional SAP System Instances ▶](#)

- Perform other tasks or install additional components
Go to [▶ Generic Options ▶ <Database> ▶](#) and choose the required task.

6. Choose *Next*.

i Note

If there are errors during the self-extraction process of the software provisioning manager, you can find the log file `dev_selfex.out` in the temporary directory.

7. Follow the instructions on the software provisioning manager screens and enter the required parameters.

i Note

To find more information on each parameter during the *Define Parameters* phase, position the cursor on the required parameter input field, and choose either or the *HELP* tab. Then the available help text is displayed in the *HELP* tab.

i Note

If you want to install an SCS instance [with embedded SAP Web Dispatcher \[page 29\]](#), you must choose the *Custom* parameter mode.

When processing the screens for the SCS instance installation, you are prompted to mark the corresponding checkbox on the screen *Additional Components to be Included in the SCS Instance*.

If you mark the checkbox for SAP Web Dispatcher, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

⚠ Caution

The digital signature of installation media and installation archives is checked **automatically** during the *Define Parameters* phase while processing the *Media Browser* and - if you perform an archive-based installation - the *Software Package Browser* screens.

Note that this automatic check is only committed once and **not** repeated if you modify artifacts such as SAR archives or files on the media **after** the initial check has been done. This means that - if you modify artefacts later on either during the remaining *Define Parameters* phase or later on during the *Execute Service* phase - the digital signature is not checked again.

For more information, see SAP Note [2393060](#).

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

8. To start the installation, choose *Next*.

The software provisioning manager starts the installation and displays the progress of the installation. When the installation has finished, the software provisioning manager shows the message: Execution of *<Option_Name>* has completed.

i Note

During the last restart of Application Server Java performed by the software provisioning manager, the portal starts the processing and upload of the new portal archives. It takes approximately 15 to 90 minutes before the deployment is completed and the portal is launched.

Do **not** stop the software provisioning manager or Application Server Java during this phase.

If you are performing an [Installation Using a Stack XML File \[page 33\]](#), the Software Update Manager (SUM) is started by the software provisioning manager at the end of the installation process. A browser window opens with a link to UI of the SUM that is already running. Follow the instructions on the SUM dialogs and in the SUM Guide at <https://support.sap.com/sltoolset> >>> *System Maintenance*.

9. If required, delete directories with the name `sapinst_exe.xxxx` after the software provisioning manager has finished. Sometimes these directories remain 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 medium 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.

10. If you copied the software provisioning manager software to your hard disk, you can delete these files when the installation has successfully completed.
11. For security reasons, we recommend that you remove the operating system users from the group `sapinst` **after** you have completed the installation.

i Note

This step is only required, if you did **not** specify during the *Define Parameters* phase that the operating system users are to be removed from the group `sapinst` **after** the execution of the software provisioning manager has completed.

12. For security reasons, we recommend that you delete the `.sapinst` directory within the home directory of the user with which you ran the software provisioning manager:

```
<User_Home>/ .sapinst/
```

13. The software provisioning manager log files contain IP addresses and User IDs such as the ID of your S-User. For security, data protection, and privacy-related reasons we strongly recommend that you delete these log files once you do not need them any longer.

You find the software provisioning manager log files in the `sapinst_instdir` directory. For more information, see [Useful Information about Software Provisioning Manager \[page 120\]](#).

5.7 Additional Information about Software Provisioning Manager

The following sections provide additional information about the software provisioning manager.

[Useful Information about Software Provisioning Manager \[page 120\]](#)

This section contains some useful technical background information about the software provisioning manager and the software provisioning manager's SL-UI.

[System Provisioning Using an Input Parameter File \[page 122\]](#)

Provisioning with software provisioning manager, for example installation, of SAP systems in unattended mode with an input parameter file.

[Restarting Interrupted Processing of Software Provisioning Manager \[page 126\]](#)

Here you find information about how to restart the software provisioning manager if its processing has been interrupted.

[Entries in the Services File Created by Software Provisioning Manager \[page 130\]](#)

[Troubleshooting with Software Provisioning Manager \[page 131\]](#)

This section tells you how to proceed when errors occur while the software provisioning manager is running.

[Using the Step State Editor \(SAP Support Experts Only\) \[page 132\]](#)

This section describes how to use the `Step State Editor` available in the software provisioning manager.

5.7.1 Useful Information about Software Provisioning Manager

This section contains some useful technical background information about the software provisioning manager and the software provisioning manager's SL-UI.

- The software provisioning manager has a framework named "SAPinst". For more information about the current SAPinst Framework version and its features, see SAP Note [3207613](#) (SAPinst Framework 753 Central Note).
- The software provisioning manager has the web browser-based "SL-UI of the software provisioning manager" - "SL-UI" for short.

The SL-UI uses the SAP UI Development Toolkit for HTML5 - also known as SAPUI5 - a client-side HTML5 rendering library based on JavaScript. The benefits of this new user interface technology for the user are:

- Zero foot print, since only a web browser is required on the client
- New controls and functionality, for example, view logs in web browser.

As of version 1.0 SP24 Patch Level (PL) 5, the software provisioning manager comes with a new look and feel of the SL-UI. For more information, see <https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/>.

The SL-UI connects the web browser on a client with the `sapinst` executable - which is part of software provisioning manager - running on the installation host using the standard protocol HTTPS.

For the SL-UI the software provisioning manager provides a pre-generated URL at the bottom of the shell from which you are running the software provisioning manager. If you have a supported web browser installed on the host where you run the software provisioning manager, you can start the SL-UI directly from this URL. Otherwise, open a web browser supported by the SL-UI on any device and run the URL from there.

For more information about supported web browsers see [Prerequisites for Running Software Provisioning Manager \[page 110\]](#).

If you need to run the **SL-UI in accessibility mode**, apply the standard accessibility functions of your web browser.

- As soon as you have started the `sapinst` executable, the software provisioning manager creates a `.sapinst` directory underneath the `/home/<User>` directory where it keeps its log files. `<User>` is the user with which you have started the software provisioning manager.
After you have reached the [Welcome](#) screen and selected the relevant software provisioning manager option for the SAP system or instance to be installed, the software provisioning manager creates a directory `sapinst_instdir` where it keeps its log files, and which is located directly below the temporary directory. The software provisioning manager 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 software provisioning manager uses `/tmp` by **default**.
All log files which have been stored so far in the `.sapinst` folder are moved to the `sapinst_instdir` directory as soon as the latter has been created.
If you want the `sapinst_instdir` directory to be created in another directory than `/tmp`, set the environment variable `TEMP`, `TMP`, or `TMPDIR` to this directory before you start the software provisioning manager.

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, or there might be problems when the Java Virtual Machine is started.

The software provisioning manager records its progress in the `keydb.xml` file located in the `sapinst_instdir` directory. Therefore, if required, you can continue with the software provisioning manager from any point of failure, without having to repeat the already completed steps and without having to reenter the already processed input parameters. For security reasons, a variable encryption key is generated as soon as the `sapinst_instdir` directory is created by the software provisioning manager. This key is used to encrypt the values written to the `keydb.xml` file.

→ Recommendation

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

- The software provisioning manager extracts itself to the temporary directory. These executables are deleted again after the software provisioning manager has stopped running. Directories called `sapinst_exe.xxxxxx.xxxx` sometimes remain in the temporary directory after the software provisioning manager has finished. You can safely delete them. The temporary directory also contains the log file `dev_selfex.out` from the self-extraction process of the software provisioning manager, which might be useful if an error occurs.

⚠ Caution

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

- To see a list of all available software provisioning manager properties (command line options) and related documentation, start the software provisioning manager as described above with command line parameter `-p`:
`./sapinst -p`
- If you want to perform the installation in unattended mode, see [System Provisioning Using an Input Parameter File \[page 122\]](#) which describes an improved procedure using `infile.params`.
- If required, stop the software provisioning manager by choosing the *Cancel* button.

i Note

If you need to terminate the software provisioning manager, press `Ctrl + C`.

5.7.2 System Provisioning Using an Input Parameter File

Provisioning with software provisioning manager, for example installation, of SAP systems in unattended mode with an input parameter file.

Prerequisites

Provisioning of SAP systems can also be done in unattended mode without the user interface of software provisioning manager. This means that, after inserting the required parameters into a parameter-file and running the sapinst executable by providing the path to this parameter-file, the installation will run in the background and no further user interaction is required.

Context

This section describes the steps that you need to execute in addition to the procedure described in this guide, when running software provisioning manager in unattended mode using an input parameter file.

Since the new Web-based SL-UI (see [Useful Information about Software Provisioning Manager \[page 120\]](#)) was introduced in 2017 there are two ways to run the unattended mode: “observer mode” and “non-observer mode”.

Observer Mode

If you are running an installation in unattended mode but you are sitting in front of the screen, you might want to check the progress from time to time. In this case the “observer mode” makes sense.

Start the installation as described below in the Solution section, using the following parameters:

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
SAPINST_SKIP_DIALOGS=true
```

The software provisioning manager will start the installation in the background AND start a Web Dispatcher and provide an URL to access the SL-UI. The user who has started the installation can now connect to the URL and observe the progress of the installation, for example to look at the logfiles in the Web browser. However, all parameters will be taken from the input parameter file and can not be changed in the Web browser.

Non-Observer Mode

Choose that mode if you want to run a “scripted” or by other means automated scenario, for example overnight. In that case it is crucial that the process is started without a Web Dispatcher and therefore without the software provisioning manager’s SL-UI. Otherwise, the automation could be stuck if software provisioning manager encounters a situation that requires user interaction.

Start the installation as described below in the Solution section, using the following parameters (use the same parameters like for Observer Mode, but provide **SAPINST_START_GUISERVER=false** in addition):

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
```

```
SAPINST_SKIP_DIALOGS=true
SAPINST_START_GUISERVER=false
```

This will start the installation but this time **NO** Web Dispatcher will be started and no URL to access the SL-UI will be provided either. So the user can not follow the processing of the installation in a Web browser and the installation will run completely in the background.

If the process runs into an error, the software provisioning manager will abort and you have to check for the reason in the log files.

Restrictions

In exceptional cases, parameters prompted or displayed in the Software Provisioning Manager UI are not maintainable in the input parameter file. If one of those parameters, that are only available in the UI mode of the Software Provisioning Manager, is needed for your unattended installations, you should create a ticket in the best fitting component below BC-INS to get the issue analyzed.

Must Know about the Input Parameter File

- The input parameter file only contains values that you entered in the software provisioning manager's SL-UI.
- With the `SAPinst 749.0.69` or by other means patch we provide a better encryption of passwords in software provisioning manager files:
If the input parameter file has parameters which are encrypted with Des25 encryption, the `instkey.pkey` file available in the installation directory contains the key for the encryption. The `instkey.pkey` file must be always located in the same directory as the input parameter file and is used to decrypt the values of the encrypted parameters. If you need to copy an input parameter file to another directory, you must also copy the `instkey.pkey` file to this directory.
- Not explicitly set parameters are documented as comments in the generated input parameter file.
- Each parameter has got a documentation assigned as a comment on top.

❖ Example

Example for a parameter that is not used and therefore commented out:

```
# Specify whether software provisioning manager is to drop the schema if
it exists. <= Documentation
# HDB_Schema_Check_Dialogs.dropSchema = false
```

❖ Example

Example for a parameter that is used:

```
# The name of the database schema. <= Documentation
HDB_Schema_Check_Dialogs.schemaName = SAPABAP2
```

- You have to manually provide the media information, using the following convention:

```
SAPINST.CD.PACKAGE.<unique_media_name>=<location>
```

- For each media location you must **manually** insert a dedicated line in your input parameter file. The software provisioning manager does not automatically take over the media locations you entered while processing the *Media Browser* dialog.
- For `<media_name>` you can choose any value, but the `<location>` must be unique.

- To find out the required media entries, open the summary.html file which you can find in the installation directory and go to the *Dialog "Media"* section.
- Make sure that you enter the full paths to all required media, relative paths are not sufficient.

❁ Example

Example on UNIX:

```
SAPINST.CD.PACKAGE.KERNEL = /mnt/KERNEL
SAPINST.CD.PACKAGE.LOAD = /mnt/LOAD
SAPINST.CD.PACKAGE.RDBMS = /mnt/RDBMS
```

❁ Example

Example on Windows:

```
SAPINST.CD.PACKAGE.KERNEL = C:\sapdvds\KERNEL
SAPINST.CD.PACKAGE.LOAD = C:\sapdvds\LOAD
SAPINST.CD.PACKAGE.RDBMS = C:\sapdvds\RDBMS
```

- If one media contains several subfolders, you can specify it in one of the following ways:

❁ Example

The SAP Export DVDs/media:

```
Installation Master      /usr/local/TESE/SWPM/slinst_d_stream/
IM_OS400_PPC64
Installation Export NW73 (folder EXP1)      /sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP1
Installation Export NW73 (folder EXP3)      /sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP3
Installation Export NW73 (folder EXP2)      /sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP2
```

- By specifying each subfolder:

```
SAPINST.CD.PACKAGE.ExportNW73EXP1=/sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP1

SAPINST.CD.PACKAGE.ExportNW73EXP2=/sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP3

SAPINST.CD.PACKAGE.ExportNW73EXP3=/sapmnt/mediaserver2/
arch04_6/51042309/DATA_UNITS/EXP3
```

- By specifying only the root-folder:

```
SAPINST.CD.PACKAGE.ExportNW73=/sapmnt/mediaserver2/arch04_6/51042309
```

- **Restriction:** Currently you can only specify complete media, not paths to single files like *.SAR archives.
- When performing a system copy, you need to add one additional media path:

```
SAPINST.CD.PACKAGE.JMIG = <full path to Java Export media>
```

- **Caution:**

If you want to use archives for your installation, you must copy all files that are to be used to a single directory. In the input parameter file you must specify this directory as a download basket, using the `archives.downloadBasket` parameter.

Make sure that there is only one version of the same archive in the directory, for example `SAPPEXE_<Version>.SAR`

Procedure

1. You plan and prepare the run as described in [Planning \[page 32\]](#) and [Preparation \[page 70\]](#).
2. Create your input parameter file as follows:
 1. Start software provisioning manager as described in [Running Software Provisioning Manager \[page 113\]](#).
 2. Choose the option you want to run, and follow the instructions on the screens by entering all parameter values.
 3. Stop after the *Parameter Summary* screen has been displayed.
 4. Find the input parameter file named "inifile.params" in the installation directory.
 - In the same directory, you will also find the `instkey.pkey` file with the keys for the encrypted parameters. For more information, see *Must Know about the Input Parameter File* above.
 - In the same directory, you will also find the `summary.html` file with the required media locations. For more information, see *Must Know about the Input Parameter File* above.
 5. If required, you can rename the "inifile.params" file as you wish.
3. Adjust the values of the input parameter file as follows:
 1. Edit your input parameter file and modify the parameters according to your needs.
 2. Add required media or archives information line by line.
4. Identify the Product-ID:
 - To start in unattended mode, you need to know the component ID for the option that are required for your provisioning scenario.
Proceed as follows:
 1. Open the `sapinst_dev.log` in the installation directory.
 2. Check for the "product-id"

❖ Example

```
product-id=NW_ABAP_ASCS:NW750.ADA.ABAP
```

- Alternatively, you can check the header of the generated input parameter file.

❖ Example

```
product id 'NW_ABAP_ASCS:NW750.ADA.ABAP'
```

5. [Run the software provisioning manager \[page 113\]](#) with the parameters required for unattended mode:
 - Make sure that the `instkey.pkey` file with the keys for the encrypted parameters is available in the same directory as the input parameter file. Otherwise the encrypted parameters cannot be decrypted. For more information, see *Must Know about the Input Parameter File* above.

- **In observer mode:** Start the sapinst executable from an empty directory with the following parameters:

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
SAPINST_SKIP_DIALOGS=true
```

- **In non-observer mode:** Start the sapinst executable from an empty directory with the following parameters:

```
SAPINST_INPUT_PARAMETERS_URL=<path_to_your_parameterfile>
SAPINST_EXECUTE_PRODUCT_ID=<product-id for the installation>
SAPINST_SKIP_DIALOGS=true
SAPINST_START_GUISEVER=false
```

6. After software provisioning manager has completed, perform follow-up activities as described in [Post-Installation \[page 134\]](#).

Related Information

[SAP Note 2230669 Provisioning with software provisioning manager - for example installation - of SAP systems in unattended mode with an input parameter file](#)

[SAP Note 2849054 Software Update Manager Automation with software provisioning manager](#)

[SAP Note 2742212 Unattended installation fails with "Empty directory name is not allowed." message](#)

[SAP Note 2626837 'isUnicode': Radio group contains an invalid value ". Valid values are: false|true|](#)

[SAP Note 2482103 Installation with Software Provisioning Manager in unattended mode using input parameter file fails](#)

[SAP Note 2974889 Installation with Software Provisioning Manager in unattended mode fails in step getDBInfo due to missing paramerters](#)

5.7.3 Restarting Interrupted Processing of Software Provisioning Manager

Here you find information about how to restart the software provisioning manager if its processing has been interrupted.

Context

The processing of the software provisioning manager might be interrupted for one of the following reasons:

- An error occurred during the *Define Parameters* or *Execute* phase:
The software provisioning manager 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 processing of the software provisioning manager by choosing *Cancel* in the SL-UI.

⚠ 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:

Option	Definition
<i>Retry</i>	<p>The software provisioning manager retries the installation from the point of failure without repeating any of the previous steps.</p> <p>This is possible because the software provisioning manager records its 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 software provisioning manager displays the same dialog box again.</p>
<i>Stop</i>	<p>The software provisioning manager stops the installation, closing the dialog box and the software provisioning manager's SL-UI.</p> <p>The software provisioning manager records its progress in the <code>keydb.xml</code> file. Therefore, you can continue with the software provisioning manager from the point of failure without repeating any of the previous steps. See the procedure below.</p>
<i>Continue</i>	The software provisioning manager continues the installation from the current point.
<i>View Log</i>	Access installation log files.

i Note

You can also terminate the software provisioning manager by choosing `Ctrl` + `C` but we do **not** recommend this because it kills the process immediately.

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

Procedure

- Log on to the installation host as a user with the required permissions as described in [Running Software Provisioning Manager \[page 113\]](#).
- Make sure that the installation media are still available.

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

Oracle Solaris: If you mount installation media, make sure that you do this with option `nomap1case`.

End of 'Platform': Oracle Solaris

- 3. Make sure that the installation media are still available.

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

Oracle Solaris: If you mount installation media, make sure that you do this with option `nomap1case`.

End of 'Platform': Oracle Solaris

- 4. Restart the software provisioning manager from the directory to which you unpacked the Software Provisioning Manager archive by executing the following command:

```
<Path_To_Unpack_Directory>/sapinst
```

- 5. The software provisioning manager is restarting.

You can find the URL you require to access the SL-UI at the bottom of the shell from which you are running the software provisioning manager.

```
...
*****
Open your browser and paste the following URL address to access the GUI
https://[<hostname>]:4237/sapinst/docs/index.html
Logon users: [<users>]
*****
...
```

i Note

If the host specified by `<hostname>` cannot be reached due to a special network configuration, proceed as follows:

1. Terminate the software provisioning manager as described in [Useful Information about Software Provisioning Manager \[page 120\]](#).
2. Restart the software provisioning manager from the command line with the `SAPINST_GUI_HOSTNAME=<hostname>` property.
You can use a fully-qualified host name.

If you have a supported web browser (see [Prerequisites for Running Software Provisioning Manager \[page 110\]](#)) installed on the host where you run the software provisioning manager, you can open this URL directly in the shell. Otherwise, open the URL in a supported web browser that runs on another device.

⚠ Caution

After opening the browser URL, make sure that the URL in the browser starts with “https://” to avoid security risks such as SSL stripping .

Before you reach the *Welcome* screen, your browser warns you that the certificate of the `sapinst` process on this computer could not be verified.

Proceed as follows to avoid security risks such as a man-in-the-middle attack:

1. Click on the certificate area on the left hand side in the address bar of your browser, and view the certificate.
2. Open the certificate fingerprint or thumbprint, and compare all hexadecimal numbers to the ones displayed in the console output of the software provisioning manager.

Proceed as follows to get the certificate fingerprint or thumbprint from the server certificate printed in the software provisioning manager console:

1. Go to the `sapinst_exe .xxxxxx .xxxx` directory in the temporary directory to which the software provisioning manager has extracted itself:

```
<User_Home>/.sapinst/
```

2. In the `sapinst_exe .xxxxxx .xxxx` directory, execute the `sapgenpse` tool with the command line option `get_my_name -p`.

As a result, you get the server fingerprint or thumbprint from the server certificate.

3. Accept the warning to inform your browser that it can trust this site, even if the certificate could not be verified.

The SL-UI opens in the browser by displaying the *Welcome* screen.

6. 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.

7. On the *What do you want to do?* screen, decide between the following alternatives and continue with *Next*:

Alternative	Behavior
<i>Perform a new run</i>	<p>The software provisioning manager does not continue the interrupted installation option. Instead, it moves the content of the old software provisioning manager directory and all software provisioning manager-specific files to a backup directory. Afterwards, you can no longer continue the old 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="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p>❖ Example</p> <pre>log_01_Oct_2016_13_47_56</pre> </div> <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p>i 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="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p>⚠ Caution</p> <p>The software provisioning manager 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 existing one</i>	<p>The software provisioning manager continues the interrupted installation from the point of failure.</p>

5.7.4 Entries in the Services File Created by Software Provisioning Manager

After the installation has finished successfully, the software provisioning manager 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
```

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.

5.7.5 Troubleshooting with Software Provisioning Manager

This section tells you how to proceed when errors occur while the software provisioning manager is running.

Context

If an error occurs, the software provisioning manager:

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

Procedure

1. Check SAP Note [SAP Note 3207613](#) (SAPinst Framework 753 Central Note) for known software provisioning manager issues.
2. If an error occurs during the *Define Parameters* or the *Execute Service* phase, do one of the following:
 - Try to solve the problem:
 - To check the software provisioning manager log files (`sapinst.log` and `sapinst_dev.log`) for errors, choose the *LOG FILES* tab.

i Note

The *LOG FILES* tab is only available if you have selected on the *Welcome* screen the relevant software provisioning manager option for the SAP product to be installed .

If you need to access the log files before you have done this selection, you can find them in the `.sapinst` directory underneath the `/home/<User>` directory, where `<User>` is the user that you used to start the software provisioning manager.

For more information, see [Useful Information about Software Provisioning Manager \[page 120\]](#).

- To check the log and trace files of the software provisioning manager's SL-UI for errors, go to the directory `<User_Home>/ .sapinst/`
- Then continue by choosing *Retry*.

- If required, abort the software provisioning manager by choosing *Cancel* in the tool menu and restart the software provisioning manager. For more information, see [Restarting Interrupted Processing of Software Provisioning Manager \[page 126\]](#).
3. If you cannot resolve the problem, report an incident using the appropriate subcomponent of BC-INS*. For more information about using subcomponents of BC-INS*, see SAP Note [1669327](#).

5.7.6 Using the Step State Editor (SAP Support Experts Only)

This section describes how to use the `Step State Editor` available in the software provisioning manager.

Note

Only use the `Step State Editor` if the SAP Support requests you to do so, for example to resolve a customer incident.

Prerequisites

- SAP Support requests you to use the `Step State Editor`.
- Make sure that the host where you run the software provisioning manager meets the requirements listed in [Prerequisites for Running Software Provisioning Manager \[page 110\]](#).

Procedure

1. Start the software provisioning manager from the command line as described in [Running Software Provisioning Manager \[page 113\]](#) with the additional command line parameter `SAPINST_SET_STEPSTATE=true`
2. Follow the instructions on the software provisioning manager screens and fill in the parameters prompted during the *Define Parameters* phase until you reach the *Parameter Summary* screen.
3. Choose *Next*.

The `Step State Editor` opens as an additional dialog. Within this dialog you see a list of all steps to be executed by the software provisioning manager during the *Execute Service* phase. By default all steps are in an initial state. Underneath each step, you see the assigned software provisioning manager component. For each step you have a *Skip* and a *Break* option.

- Mark the checkbox in front of the *Break* option of the steps where you want the software provisioning manager to pause.
 - Mark the checkbox in front of the *Skip* option of the steps which you want the software provisioning manager to skip.
4. After you have marked all required steps with either the *Break* or the *Skip* option, choose *OK* on the *Step State Editor* dialog.

The software provisioning manager starts processing the *Execute Service* phase and pauses one after another when reaching each step whose *Break* option you have marked. You can now choose one of the following:

- Choose *OK* to continue with this step.
 - Choose *Step State Editor* to return to the `step state editor` and make changes, for example you can repeat the step by marking the checkbox in front of the *Repeat* option.
 - Choose *Cancel* to abort the software provisioning manager.
5. Continue until you have run through all the steps of the *Execute Service* phase of the software provisioning manager.

6 Post-Installation

6.1 Post-Installation Checklist

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

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

More detailed information about the steps are available in the linked sections.

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 \[page 155\]](#) 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 software provisioning manager.
For more information, see [Creating Operating System Users and Groups \[page 71\]](#).
3. You check whether you can [log on to the Application Server Java \[page 135\]](#).
4. You [install the SAP license \[page 139\]](#).
5. If you have installed a high-availability system, you [set up the licenses for high availability \[page 140\]](#).
6. You [configure the remote connection to SAP support \[page 141\]](#).
7. For production systems it is highly recommended that you [connect the system to SAP Solution Manager \[page 142\]](#).
8. You [apply the latest kernel and Support Packages \[page 144\]](#).
9. If you have completed the installation of SAP Solution Manager 7.2 by installing *SAP Solution Manager 7.2 Java* or SAP Solution Manager 7.1 powered by SAP HANA by installing *SAP Solution Manager powered by SAP HANA Java*, you [configure your SAP Solution Manager system after installation \[page 145\]](#).
10. If you have completed the installation of an SAP Process Integration (PI) 7.5 system by installing *Application Server Java for SAP Process Integration*, you [configure your Process Integration system after installation \[page 146\]](#).
11. **PI-PCK, PI-AF, PI-AEX, PI-CP Only:** [PI-PCK, PI-AF, PI-AEX, PI-CP Only: System Configuration After the Installation \[page 147\]](#).
12. You [ensure user security \[page 150\]](#).
13. You [run automated configuration \[page 153\]](#).
14. If you have installed a non-central Advanced Adapter Engine as an optional standalone unit, you [clear the SLD Data Cache \[page 154\]](#).

15. You [enable the database \[page 154\]](#).
16. You [perform a full installation backup \[page 155\]](#).
17. If you chose to install an embedded SAP Web Dispatcher within the SCS instance, you [log on to the SAP Web Dispatcher Management Console \[page 157\]](#)
18. If you chose to install an embedded SAP Web Dispatcher within the SCS instance, you [configure the SAP Web Dispatcher \[page 158\]](#)
19. You check the Master Guide for your SAP Business Suite application, SAP Solution Manager system (section *Implementation Sequence*) or SAP NetWeaver application (section *Configuration of Systems and Follow-Up Activities*) for additional 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 \[page 155\]](#) 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 software provisioning manager.
For more information, see [Creating Operating System Users and Groups \[page 71\]](#).
3. You check whether you can [log on to the Application Server Java \[page 135\]](#).
4. You [ensure user security \[page 150\]](#).
5. You [perform a full installation backup \[page 155\]](#).

6.2 Logging On to the Application Server Java

You need to check that you can log on to the Application Server Java with the appropriate administrator user, given in the table below.

Prerequisites

- The SAP system is up and running.
- For the Application Server Java of an SAP Process Integration (PI) 7.5 system or SAP Solution Manager 7.2 system, you must have configured the connection to the ABAP system.

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.

Java User in a Dual-Stack System (SAP Process Integration (PI) 7.5 system or SAP Solution Manager 7.2 system only)

User	User Name Storage: ABAP System
Administrator	J2EE_ADMIN (default) or the name you gave this user during the installation process.

Depending on your SAP system installation, the administrator user can either reside in the database of your Java system or in an external ABAP system.

Java Standalone User

User	User Name Storage: Database	User Name Storage: External ABAP System
Administrator	Administrator	The user that you created manually in the external ABAP system. The recommended name is J2EE_ADM_<SAPSID_Java_System>

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

Procedure

1. Start a web browser and enter the following URL:

http://<Hostname_of_AS_Java_Server>:5<Instance_Number>00

Note

You must always enter a two-digit number for <Instance_Number>. For example, do **not** enter **1** but instead enter **01**.

Example

If you installed SAP NetWeaver Application Server for Java on host `saphost06` and the instance number of your SAP NetWeaver Application Server for Java is `04`, enter the following URL:

http://saphost06:50400

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

2. Log on by pressing the link of any of the provided applications, for example [SAP NetWeaver Administrator](#) or [System Information](#).

Related Information

[Preparing an External ABAP System as Source for User Data \[page 85\]](#)

6.3 Logging On to the SAP Enterprise Portal

You need to check that you can log on to the application server using the following standard users. This procedure applies when you have installed *EP Core - Application Portal* only and when you have installed it together with *Enterprise Portal (EP)*.

Prerequisites

The SAP system is up and running.

Context

Java Standalone User

User	User Name Storage: Database	User Name Storage: External ABAP System
Administrator	Administrator	The user that you created manually in the external ABAP system. The recommended name is <code>J2EE_ADM_<SAPSID_Java_System></code>

You access the SAP Enterprise Portal with a URL using a web browser from your client machines.

The default URL consists of the installation host name and the port on which the portal is listening. You can use the HTTP or HTTPS protocol. HTTPS is relevant if you are using Secure Sockets Layer (SSL) communication.

Procedure

1. Start a web browser and enter the following URL: `http://<Hostname_of_AS_Java_Server>:5<Instance_Number>00/irj`

i Note

You must always enter a two-digit number for `<Instance_Number>`. For example, do **not** enter `1` but instead enter `01`.

❖ Example

If you installed the SAP Enterprise Portal on host `saphost06` and the instance number of your Application Server Java is `04`, enter the following URL:

<http://saphost06:50400/irj>

2. Log on by entering the required user and password.

6.4 Logging On to the Development Infrastructure

If you have installed Development Infrastructure (DI), you have to log on to the services of the Development Infrastructure to check whether the installation of the DI was successful.

Procedure

1. Start a web browser and enter the following URL: http://<Hostname_of_AS_Java_Server>:5<Instance_Number>00/devinf

i Note

You must always enter a 2-digit number for `<Instance_Number>`. For example, do **not** enter `1` but instead enter `01`.

❖ Example

If you installed SAP NetWeaver Application Server for Java with DI on host `saphost06` and the instance number of your SAP NetWeaver Application Server for Java is `04`, enter the following URL:

<http://saphost06:50400>

2. Log on with the `NWDI_ADM` user.

The start page *SAP NetWeaver Development Infrastructure* appears in the web browser.

The following links appear:

- [Design Time Repository](#)
- [Component Build Service](#)
- [Change Management Service](#)
- [System Landscape Directory](#)

3. Log on to these services one after another by clicking the appropriate link:
 - a. When you click [Design Time Repository](#), the *Design Time Repository* page with the *Repository Browser* overview appears.
 - b. When you click [Component Build Service](#), the *Component Build Service* page with the *CBS Buildspace Information* appears.

- c. When you click *Change Management Service*, the *Change Management Service* page with the *CBS Buildspace Information* appears.
- d. When you click *System Landscape Directory*, you should see the *System Landscape Directory* start page.

i Note

The tables displayed on the pages might be empty. They are filled when you configure the development infrastructure either by running the Configuration Wizard or by configuring your system manually.

6.5 Providing Access to the SAP NetWeaver Administrator

To be able to log on the SAP NetWeaver Administrator, you must allow access to administration URLs of the NetWeaver Administrator in the Internet Communication Manager (ICM).

Context

Due to security restrictions, the SAP NetWeaver Administrator can only be accessed **locally** via `http://<Hostname_of_AS_Java_Server>:5<Instance_Number>00/nwa` after the installation has finished.

Procedure

Allow access to administration requests for the required network segments as described in SAP Note [1451753](#).

6.6 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>.

Procedure

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

Note

If you have installed a high-availability system, proceed as described in [High Availability: Setting Up Licenses \[page 140\]](#).

SAP Release and SAP Library Quick Link

- **SAP Solution Manager 7.2 SR2 only:** SAP NetWeaver 7.4
<http://help.sap.com/nw74>
- SAP NetWeaver 7.5
<http://help.sap.com/nw75>

SAP Library Path (Continued)

▶ [Application Help](#) ▶ [Function-Oriented View](#) ▶ [Solution Life Cycle Management](#) ▶ [SAP Licenses](#) ▶

6.7 High Availability: Setting Up Licenses

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 central services instance (SCS instance) runs.

To be able to perform a switchover, the **temporary** license that is installed automatically with the SCS 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 \[page 139\]](#) 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 key of the primary host, run the SAP NetWeaver Administrator (NWA) on any application server instance and choose **► Configuration Management ► Infrastructure Management ► Licenses ▾**.

The hardware key is displayed in the NWA.

2. Perform a switchover of the central services instance (SCS) 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 to the primary cluster node, run the NWA on any application server instance and choose:

► Configuration Management ► Infrastructure Management ► Licenses ▾

5. Perform a switchover of the central services instance (SCS) 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.

6.8 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> .

6.9 Connecting the System to SAP Solution Manager

Here you find information about how to connect your newly installed SAP system to the SAP Solution Manager in your system landscape.

i Note

You can skip this section if your newly installed SAP system is itself a SAP Solution Manager system.

Prerequisites

An SAP Solution Manager system must be available in your system landscape. For more information, see <http://help.sap.com/solutionmanager>.

Context

SAP Solution Manager gives you central access to tools, methods, and preconfigured content that you can use to evaluate and implement your solutions.

When your implementation is running, you can use SAP Solution Manager to manage, monitor, and update systems and business processes in your solution landscape, and also to set up and operate your own solution support.

Procedure

You connect a technical system to SAP Solution Manager by the following steps:

1. On the technical systems of your landscape, **data suppliers** are implemented, for example, with transaction RZ70 for Application Server ABAP and with Visual Administrator for Application Server Java.

For more information, see the SAP Solution Manager Application Help:

- If your SAP Solution Manager release is 7.2:
<http://help.sap.com/solutionmanager> >> *Version 7.2 SPS <No>* > *Application Help (English)*
> *Technical Infrastructures* > *Landscape Management Database (LMDB)* > *Setting Up the Landscape Management Infrastructure* > *Importing Landscape Data, CIM Model, and CR Content* >
- If your SAP Solution Manager release is 7.1:
<http://help.sap.com/solutionmanager> >> *Version 7.1 SPS <No>* > *Application Help (English)*
> *SAP Solution Manager Operations* > *Managing System Landscape Information* > *Managing Technical System Information* > *Register Technical Systems Automatically by Data Suppliers* >

2. The data suppliers send information about the hardware and installed software to a central **System Landscape Directory (SLD)**. Updates are sent to the SLD as well. Alternatively, systems can send

information directly to the LMDB in SAP Solution Manager, without an SLD, as described in <http://help.sap.com/solutionmanager> > > > *Version 7.2 SPS <No>* > *Application Help (English)* > *Technical Infrastructures* > *Landscape Management Database (LMDB)* > *Setting Up the Landscape Management Infrastructure* > *Importing Landscape Data, CIM Model, and CR Content* > .

For more information, see *Handling Technical Systems' Data - System Landscape Directory* at <https://support.sap.com/en/tools/software-logistics-tools/landscape-management-process/system-landscape-directory.html>.

3. From the SLD, this information is regularly synchronized with **SAP Solution Manager** where it is managed in the Landscape Management Database (LMDB).

For more information, see the SAP Solution Manager Application Help:

- If your SAP Solution Manager release is 7.2:
<http://help.sap.com/solutionmanager> > > > *Version 7.2 SPS <No>* > *Application Help (English)* > *Technical Infrastructures* > *Landscape Management Database (LMDB)* > *Setting Up the Landscape Management Infrastructure* > *Importing Landscape Data, CIM Model, and CR Content* > *Synchronization with an SLD* >
- If your SAP Solution Manager release is 7.1:
<http://help.sap.com/solutionmanager> > > > *Version 7.1 SPS <No>* > *Application Help (English)* > *SAP Solution Manager Operations* > *Managing System Landscape Information* > *Setting Up the Landscape Management Infrastructure* > *Connecting LMDB to System Landscape Directory (SLD)* >

4. In the LMDB, you complete the information from the SLD manually.

For more information, see the SAP Solution Manager Application Help:

- If your SAP Solution Manager release is 7.2:
<http://help.sap.com/solutionmanager> > > > *Version 7.2 SPS <No>* > *Application Help (English)* > *Technical Infrastructures* > *Landscape Management Database (LMDB)* > *Managing Technical System Information* >
- If your SAP Solution Manager release is 7.1:
Managing Technical System Information and *Managing Product System Information* at <http://help.sap.com/solutionmanager> > > > *Version 7.1 SPS <No>* > *Application Help (English)* > *SAP Solution Manager Operations* > *Managing System Landscape Information* >

Related Information

[Setting Up the Landscape Management Infrastructure](#)

[Importing Landscape Data, CIM Model, and CR Content](#)

[Synchronization with an SLD](#)

[Managing Technical System Information](#)

[Handling Technical Systems' Data - System Landscape Directory](#)

6.10 Applying the Latest Kernel and Support Package Stacks

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

i Note

If you are using a Stack XML file (see [Installation Using a Stack XML File \[page 33\]](#)), you already downloaded the `stack.xml` file and the delta archives. If you then already called the Software Update Manager (SUM) from the software provisioning manager and applied the Support Package Stacks after the installation had finished, you can skip this section.

Context

For more information about release and roadmap information for the SAP Kernel versions, and how this relates to SAP system support packages - including important notes on downward compatibility and release dates - see the central SAP Kernel notes:

Central SAP Notes

- [2083594](#) - SAP Kernel Versions and SAP Kernel Patch Levels
- [3116151](#) - SP Stack Kernel Schedule Forecast
- [1744209](#) - SAP Kernel 720, 721 and 722: Versions and Kernel Patch Levels
- [1969546](#) - Release Roadmap for Kernel 74x and 75x
- [1802333](#) - Finding information about regressions in the SAP kernel
- [19466](#) - Downloading SAP kernel patches
- [2966761](#) - Overview of SAP Kernel Correction Archives
- [2966621](#) - Overview of Kernel-Related Software Components
- [953653](#) - Rolling Kernel Switch

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 Software Update Manager documentation at: <https://support.sap.com/en/tools/software-logistics-tools/software-update-manager.html>

⚠ Caution

If you install an SAP system based on SAP NetWeaver **7.5 Java**, follow the instructions in SAP Note [1680045](#) regarding the patch level of the `SAPJVM.SAR` archive you use for the installation.

- If you want to update the kernel manually, proceed as described below:
 - a. Log on as user `<sapsid>adm` to the hosts of the SAP system instances to be updated.
 - b. Download the latest kernel for your operating system and database platform as described in SAP Note [19466](#).
 - c. Back up the kernel directory that is specified by the profile parameter `DIR_CT_RUN`.
 - d. Extract the `SAR` files of the kernel Support Packages of the target SP level to a temporary directory using the `SAPCAR` tool.
 - e. Copy or move the extracted programs from the temporary directory to the local kernel directory.
 - f. 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 Configuring an SAP Solution Manager System

If you have completed the installation of SAP Solution Manager 7.2 by installing *SAP Solution Manager 7.2 Java* or SAP Solution Manager 7.1 powered by SAP HANA by installing *SAP Solution Manager powered by SAP HANA Java*, you run the `SOLMAN_SETUP` transaction in *SAP Solution Manager 7.2 ABAP* respectively *SAP Solution Manager powered by SAP HANA ABAP*

i Note

You can skip this section if your newly installed SAP system is not itself an SAP Solution Manager system.

i Note

Configuring the user management with an external ABAP system is mandatory for SAP Process Integration 7.5. For more information, see [Preparing an External ABAP System as Source for User Data \[page 85\]](#).

Follow the instructions of section *Configuring SAP Solution Manager* of the *SAP Solution Manager Configuration Guide* at:

SAP Solution Manager Release and SAP Solution Manager Library Quick Link	SAP Library Path (Continued)
SAP Solution Manager 7.2 https://help.sap.com/viewer/product/SAP_Solution_Manager/	▶ <i>Version 7.2 <latest version></i> ▶ <i>Use Configuration Guide</i> ▶
SAP Solution Manager 7.1 powered by SAP HANA https://help.sap.com/viewer/product/SAP_Solution_Manager/	▶ <i>Version 7.1 <latest version></i> ▶ <i>Implement Configuration Guide</i> ▶

6.12 PI 7.5: Configuring the Process Integration System After the Installation

To configure your SAP Process Integration 7.5 (SAP PI 7.5) system after installation, execute the Central Technical Configuration (CTC) Wizard.

i Note

Configuring the user management with an external ABAP system is mandatory for SAP Process Integration 7.5. For more information, see [Preparing an External ABAP System as Source for User Data \[page 85\]](#).

Procedure

To configure your SAP PI 7.5 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.

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

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)

6.13 PI-PCK, PI-AF, PI-AEX, PI-CP Only: System Configuration After the Installation

The CTC Wizards or Functional Unit Configurations execute automatically all required technical configuration steps.

CTC Wizards or Functional Unit Configurations

SAP Note [1362909](#) collects all notes that describe the CTC Wizards or Functional Unit Configurations, which must be executed in each of the following systems after the installation:

- Composition Environment (CE)
- Advanced Adapter Engine Extended (PI-AEX)
- Advanced Adapter Engine (PI-AF)
- Partner Connectivity Kit (PI-PCK)
- Process Orchestration (PI-CP)

SAP NetWeaver 7.30: Configuring the Partner Connectivity Kit (PI-PCK)

To configure your PI-PCK system after the installation, execute the “PI-PCK initial setup” CTC Wizard described in SAP Note [1319008](#).

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

<http://help.sap.com/nw73> ▶ [Application Help](#) > [Function-Oriented View](#) > [Process Integration](#)
> [Configuring Process Integration \(PI\) After Installation](#) > [Basic Configuration \(CTC Wizard-Assisted and Manual\)](#)
> [Configuring the Partner Connectivity Kit](#) > [Wizard-Based Configuration for the PCK](#)

Configuring the Adapter Engine (PI-AF)

To configure your PI-AF system after the installation execute “PI-AF initial setup” CTC Wizard described in SAP Note [1314855](#).

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

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
SAP NetWeaver 7.5 http://help.sap.com/nw75	If you want to connect PI-AF to a PI system: ▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Process Integration</i> ▶ <i>Configuring Process Integration After Installation</i> ▶ <i>Configuring Process Integration (PI) Dual Usage Type</i> ▶ <i>Basic Configuration for SAP Process Integration (PI)</i> ▶ <i>Configuring the Non-Central Advanced Adapter Engine (PI-AF)</i> ▶ <i>Manual Configuration of Non-Central Advanced Adapter Engine (PI-AF)</i> If you want to connect PI-AF to a PI-AEX or PI-CP system: ▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Process Integration</i> ▶ <i>Configuring Process Integration After Installation</i> ▶ <i>Configuring Advanced Adapter Engine Extended (PI-AEX)</i> ▶ <i>Basic Configuration for SAP PI Advanced Adapter Engine Extended</i> ▶ <i>Configuring the Non-Central Advanced Adapter Engine (PI-AF) for AEX</i>

Configuring the Advanced Adapter Engine Extended (PI-AEX)

To configure your PI-AEX system after the installation, execute the “PI-AEX initial setup” CTC Wizard described in SAP Note [1414465](#).

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

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
• SAP NetWeaver 7.5 http://help.sap.com/nw75	▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Process Integration</i> ▶ <i>Configuring Process Integration After Installation</i> ▶ <i>Configuring Advanced Adapter Engine Extended (PI-AEX)</i>

Configuring the Process Orchestration (PI-CP)

To configure your PI-CP system after the installation, execute the “PI-CP initial setup” CTC Wizard described in SAP Note [1548120](#).

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

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">SAP NetWeaver 7.5 http://help.sap.com/nw75	<p>▶ <i>Application Help</i> ▶ <i>Function-Oriented View</i> ▶ <i>Process Integration</i> ▶ <i>Configuring Process Integration After Installation</i> ▶ <i>Configuring Process Orchestration (PI-CP)</i></p>

6.14 Configuring the User Management

After the installation has completed, configure the user management of your SAP system.

Note

For SAP Process Integration 7.5 and SAP Solution Manager configuring the user management with an external ABAP system is mandatory. For more information, see [Preparing an External ABAP System as Source for User Data \[page 85\]](#).

For SAP Process Integration 7.5 and SAP Solution Manager go to [PI 7.5: Configuring the Process Integration System After the Installation \[page 146\]](#) respectively [Configuring an SAP Solution Manager System \[page 145\]](#).

Context

For Solution Manager and Process Integration 7.5, your UME has been configured with the ABAP part of the system during the target system installation. For other SAP system products this configuration is optional. For more information, see [Preparing an External ABAP System as Source for User Data \[page 85\]](#).

Procedure

During the installation of your SAP system, you specified one of the following initial data sources of the User Management Engine (UME) (for more information, see [SAP System Parameters \[page 52\]](#)):

- Database of the Application Server Java
- External ABAP system

After the installation of your SAP system has finished, you can still change the data source of the UME. The following changes of data source are supported:

- From the database of the Application Server Java to user management of an external ABAP system
- From the database of the Application Server Java to a directory service

⚠ Caution

This is not valid for an Advanced Adapter Engine (AEX) installation.

For more information about changing the data source after installation and about related restrictions, see the SAP Library at:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">• SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4 https://help.sap.com/nw74• SAP NetWeaver 7.5 https://help.sap.com/nw75	<p>▶ Security ▶ Identity Management ▶ User Management of SAP NetWeaver AS Java ▶ Configuring User Management</p> <p>▶ UME Data Sources ▶ User Management of Application Server ABAP as Data Source ▶</p>

6.15 Ensuring User Security

You need to ensure the security of the users that the software provisioning manager 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 software provisioning manager by default assigned the [master password \[page 52\]](#) to all users created during the installation unless you specified other passwords.

→ Recommendation

The Master Password feature can be used as a simple method to obtain customer-specific passwords for all newly created users. A basic security rule is not to have identical passwords for different users. Following this rule, we strongly recommend individualizing the values of these passwords after the installation is complete.

→ 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.

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

You can find the security guide in the *Security* section of the product page for your SAP product at <https://help.sap.com/>

Operating System and Database Users

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

→ Recommendation

For security reasons, we recommend that you remove the operating system users from the group `sapinst` **after** you have completed the installation of your SAP system.

You do not have to do this if you specified this “cleanup” already during the *Define Parameters* phase on the *Cleanup Operating System Users* screen. Then the removal had already been done automatically when the processing of the software provisioning manager had completed. For more information, see *Operating System Users* in *SAP System Parameters* [page 52].

Operating System Users

User	Primary Group
UNIX superuser <code>root</code>	No primary group assigned by the software provisioning manager (group <code>sapinst</code> is assigned as secondary group)
SAP system administrator <code><sapsid>adm</code>	<code>sapsys</code> (<code>sapinst</code> secondary group)
<code>syb<dbsid> as secondary group)</code>	<code>sapsys</code>

SAP Host Agent User

User Type	User	Comment
Operating system user	<code>sapadm</code>	<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

Depending on the UME (User Management Engine) configuration that you specified during the installation, the following UME users are available after the installation:

- If you have chosen option *Use Java Database*, UME users are stored in the database (Java UME) – see table *Users Stored in the Java Database* below.
You can manage users and groups with the UME web admin tool and the SAP NetWeaver Administrator only.
- If you have chosen option *Use ABAP*, UME users are stored in an external ABAP system (ABAP UME) – see table *Users Stored in an External ABAP System* below.
For more information, see [Preparing an External ABAP System as Source for User Data \[page 85\]](#).

The following tables show these users together with recommendations on how you can ensure the security of these users:

SAP System Users Stored in an External ABAP System

User	User Name Storage: External ABAP System	Comment
Application Server Java Administrator	The name that you gave this user when you created it manually in the external ABAP system (see Preparing an External ABAP System as Source for User Data [page 85])	This user's password is stored in secure storage. Therefore, whenever you change the administrator's password, you must also change the password in secure storage with the Config Tool.
<div style="background-color: #f0f0f0; padding: 5px; border: 1px solid #ccc;"> <p>→ Recommendation</p> <p>We recommend that you use strong password and auditing policies for this user.</p> </div>		
Application Server Java Guest	The name that you gave this user when you created it manually in the external ABAP system (see Preparing an External ABAP System as Source for User Data [page 85])	Lock this user for interactive logon.
Communication user for Application Server Java	The name that you gave this user when you created it manually in the external ABAP system (see Preparing an External ABAP System as Source for User Data [page 85])	Specify this user as a <i>Communications</i> user and not as a dialog user. This user exists in at least the SAP system client that you specified during the installation.

SAP System Users Stored in the Database

User	User Name Storage: Database	Comment
Administrator	The name that you gave this user during the installation or the default name <code>Administrator</code>	This user's password is stored in secure storage. Therefore, whenever you change the administrator's password, you must also change the password in secure storage with the AS Java Config Tool. → Recommendation We recommend that you use strong password and auditing policies for this user.
Guest	The name that you gave this user during the installation or the default name <code>Guest</code>	This user is used for anonymous access. Lock this user for interactive logon.

6.16 Performing Automated Configuration

This section provides references to documentation about how to run automated configuration tasks for the initial configuration of SAP NetWeaver functional units.

⚠ Caution

Do **not** use the functional unit configuration tool to configure functional units that have already been enabled after:

- Upgrade
- Update
- System copy

If you need to change the configuration of functional units that have already been enabled, then you must execute the configuration steps manually.

If you want to use a functional unit that has not previously been enabled, you can either use the functional unit configuration tool or execute the steps manually.

To initially configure an SAP NetWeaver functional unit, proceed as described in the SAP Library for the SAP NetWeaver release your application is based on:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">• SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4 https://help.sap.com/nw74• SAP NetWeaver 7.5 http://help.sap.com/nw75	<ul style="list-style-type: none">▶ <i>Application Help</i> ▶ <i>SAP NetWeaver Library: Function-Oriented View</i>▶ <i>Solution Life Cycle Management</i> ▶ <i>SAP NetWeaver Configuration</i>▶ <i>Configuration Wizard</i> ▶

6.17 Clearing the SLD Data Cache after Installing a Non-central Advanced Adapter Engine (Optional Standalone Unit)

When you have installed a **non-central** Advanced Adapter Engine, you need to manually clear the SLD Data Cache in the *Integration Builder* to make it visible and selectable in the communication channels.

Procedure

1. After SAPinst has finished, open the Integration Builder of your PI system at <http://<host>:<port>/dir/start/index.jsp> ▶▶ *Integration Directory* ▶ and logon as a user with the ABAP role `SAP_XI_CONFIGURATOR` assigned.
2. In the Integration Builder, choose *Environment*.
3. From the drop-down list, choose *Clear SLD Data Cache*.

6.18 Enabling the Database

Use

After the SAP system installation, you must enable the database.

Procedure

1. Make sure that the version of your database is still supported, and check if there are newer versions available. For more information, see SAP Notes [1554717](#) and [1590719](#).

2. You must enable the database for monitoring by setting up a DBA Cockpit Framework (DCF) after the SAP system installation. The DCF provides a time-based collection and evaluation of performance, configuration, and space-related data. In your SAP system, call transaction DBACOCKPIT to start the DBA Cockpit. Calling the DBA Cockpit automatically checks the existence of the DCF.

→ Recommendation

To make sure that the DCF was set up correctly, we recommend that you go to ► [Configuration](#) ► [Data Collectors and Admin Procedures](#) ► in the DBA Cockpit.

For further details, refer to the SAP ASE database administration guide https://help.sap.com/viewer/ase_admin.

3. Apply the latest patches for the DBA Cockpit. For more information, see SAP Note [1558958](#).
4. Set up Automatic Table Maintenance in the DBA Cockpit. Read the article *DBA Cockpit: Automatic Table Maintenance for SAP ASE* (<http://scn.sap.com/docs/DOC-15162>).
5. Check SAP Note [1539124](#) to make sure that the database configuration for your SAP installation complies with SAP's requirements and recommendations.
6. For systems with high load, refer to SAP Note [1722359](#).

6.19 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.

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.

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.

i 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 \[page 172\]](#).

Use the backup tool of your choice and refer to the backup software documentation. You can also use the standard UNIX commands as described below.

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
```

Note

Linux only: 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>
```

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

Linux only: 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

6.20 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 embedded SAP Web Dispatcher instance within the SCS 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/public/default.html
```

❁ Example

```
https://plx282:44300/sap/wdisp/admin/public/default.html
```

3. 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:

Related Information

[SCS Instance with Embedded SAP Web Dispatcher \[page 29\]](#)

6.21 SAP Web Dispatcher Configuration (Optional)

After installing SAP Web Dispatcher, you must configure it to be able to use it.

Note

This step is only required if you chose to install an embedded SAP Web Dispatcher instance within the SCS instance.

You can find the configuration information in the SAP Library at:

SAP Release and SAP Library Quicklink	SAP Library Path (Continued)
<ul style="list-style-type: none"> SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4 http://help.sap.com/nw74 SAP NetWeaver 7.5 http://help.sap.com/nw75 	<ul style="list-style-type: none"> Application Help > Function-Oriented View > Application Server > Application Server Infrastructure > Components of SAP NetWeaver Application Server > SAP Web Dispatcher

Related Information

[SCS Instance with Embedded SAP Web Dispatcher \[page 29\]](#)

7 SAP ASE 16.0: Auditing with SAP Adaptive Server Enterprise

As of SAP ASE 16.0 the software provisioning manager creates the database `sybsecurity` with one data device for the purpose to collect SAP ASE configuration changes per default.

It is also possible to enable further auditing options to detect penetration of the system and misuse of resources. For an overview about the available configurations, see SAP Note [2717834](#) - SYB: Discretionary Access Control configuration options offered by SWPM. The SAP ASE auditing system is described in detail in the [SAP ASE Security Administration Guide](#).

If you specify two or more data devices for the `sybsecurity` database, the software provisioning manager creates an audit table on each data device. You may want the software provisioning manager to establish a threshold procedure to automatically switch auditing tables when the current audit table becomes full. The Audit Trail Management is described in the [SAP ASE Security Administration Guide](#). Depending on the selected auditing options and system workload, a lot of events can be recorded and the size of the `sybsecurity` database must be adapted according to your specific needs.

We recommend two or more audit tables. In this way, you can set up a smoothly running auditing process in which audit tables are archived and processed without losing audit records and without manual intervention. The software provisioning manager also offers to create the optional database `sybsecurityarchive` for archiving audit records. You may want the software provisioning manager to establish a threshold procedure to automatically move audit events to the `sybsecurityarchive` database.

The size of `sybsecurityarchive` database depends on the selected auditing options, system workload and the time period of keeping the audit records in your SAP ASE system before making a database dump and removing them from the active `sybsecurityarchive` database.

i Note

You need to implement a backup strategy and a `sybsecurityarchive` database cleanup process according to your specific needs. Otherwise the `sybsecurityarchive` database will run full and you will lose auditing records.

8 SAP ASE 16.0: Disaster Recovery Setup with SAP Replication Server

8.1 Disaster Recovery Setup with SAP Business Suite on SAP ASE 16.0

The Disaster Recovery setup for SAP ASE 16.0 offers the following replication modes:

- Synchronous Replication (Hot Standby)
- Near-Synchronous Replication (Hot Standby)
- Asynchronous Replication (Warm Standby)

SAP recommends to always install the latest versions of SAP ASE and of the SAP Replication Server. For more information on the latest versions and the certified combinations of SAP ASE and SAP Replication Server, see SAP Note [1891560](#).

The DR setup with SAP ASE 16.0 provides additional features for monitoring the SAP Replication Server using the Replication Management Agent (RMA).

You can install the SAP Replication Server on the same host as SAP ASE 16.0 (co-located scenario).

For more information, see the [HADR Users Guide for SAP ASE 16.0](#), Chapter 4, *Installing HADR for SAP Business Suite* and SAP Note [1891560](#), section *Additional Information*.

9 Additional Information

9.1 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.

Preparation

- [Integration of LDAP Directory Services \[page 162\]](#)
- [Preparing an External ABAP System as Source for User Data \[page 85\]](#)

Installation

- [Installing the Host Agent Separately \[page 169\]](#)

Post-Installation

- [Starting and stopping SAP System Instances \[page 172\]](#)
- If you decided to use a generic LDAP directory, you have to [create a user for LDAP directory access \[page 178\]](#)
- [Heterogeneous SAP System Installation \[page 179\]](#)

Deleting an SAP System or SAP Instance

- [Deleting an SAP System \[page 180\]](#)

9.2 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.

⚠ Caution

SAP recommends that you no longer use the LDAP configuration options provided by the software provisioning manager, because current security guidelines make it unsafe to run SAP applications on a domain controller. Instead, SAP recommends that you follow the instructions in SAP Note [3251648](#) to enable LDAP directory service integration of your SAP system with Active 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**.

Prerequisites

You can only configure the SAP system for Active Directory services or other LDAP directories if these are **already available** on the network. The Active Directory is 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.

- You can only configure the SAP system for Active Directory services or other LDAP directories if these are **already available** on the network. The Active Directory is 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:

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:
<https://archive.sap.com/documents/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=pcintel16 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* in the SAP Library at:

SAP Release and SAP Library Quick Link

- SAP NetWeaver 7.5
<http://help.sap.com/nw75>

SAP Library Path (Continued)

▶ [Application Help](#) ▶ [Function-Oriented View](#) ▶ [Solution Life Cycle Management](#) ▶ [SAP Management Console](#) ▶

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 software provisioning manager to automatically:

⚠ Caution

SAP recommends that you no longer use the LDAP configuration options provided by the software provisioning manager, because current security guidelines make it unsafe to run SAP applications on a domain controller. Instead, SAP recommends that you follow the instructions in SAP Note [3251648](#) to enable LDAP directory service integration of your SAP system with Active Directory.

- 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 software provisioning manager 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 software provisioning manager on Windows, see the documentation *Installation of SAP Systems Based on the Application Server <Stack> of SAP NetWeaver <Release> on Windows: <Database>* at https://help.sap.com/docs/SOFTWARE_PROVISIONING_MGR_10/159a36e76fe84e54a703f846b08ae1f6/c8ed609927fa4e45988200b153ac63d1.html

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.

- **Configuration Tasks for Generic LDAP Directories on Windows**

To configure other LDAP directories, refer to the documentation of your directory vendor. The software provisioning manager software contains schema extensions for directory servers Netscape/iPlanet (`ldregns4.txt`, `ldregns5.txt`) and OpenLDAP slapd (`ldregslapd.schema`). Both files are located in the directory `\<Unpack_Directory>\COMMON\ADS`. After you have applied the schema extension, you

need to create a root container to store the SAP-related information and create a directory user that the SAP application server can use to write information to the directory.

For more information about how to set up a Netscape/iPlanet directory server, see the documentation *SAP System Information in Directory Services* at:

<https://archive.sap.com/documents/docs/DOC-14384>

- **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 software provisioning manager \[page 113\]](#) **once** for your system and choose:

⚠ Caution

SAP recommends that you no longer use the LDAP configuration options provided by the software provisioning manager, because current security guidelines make it unsafe to run SAP applications on a domain controller. Instead, SAP recommends that you follow the instructions in SAP Note [3251648](#) to enable LDAP directory service integration of your SAP system with Active Directory.

► [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.

9.3 Preparing an External ABAP System as Source for User Data

You can use an external ABAP system as the data source for user data for the Application Server Java of your SAP Java system to be installed. To do so, you configure the User Management Engine (UME) of the AS Java for the user management of this external ABAP system.

Prerequisites

The ABAP system is based on at least SAP Web AS ABAP release 6.20 SP25.

Context

i Note

If you want to install an optional standalone unit - Advanced Adapter Engine (AAE), Advanced Adapter Engine Extended (AEX), or Process Integration and Orchestration (PI-CP) - you can skip this section

because you are **not** prompted for UME Configuration. Optional standalone units are automatically configured during the installation to store the SAP system users in the Java database.

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

i Note

If you want to install the application server Java for an **SAP NetWeaver 7.5 Process Integration (PI)** system or for an **SAP Solution Manager 7.2** system, you must use the already installed Application Server ABAP (AS ABAP) as the data source for user data for the Application Server Java to be installed. In this case, the required users were already created during the installation of the Application Server ABAP and you are prompted to enter these users during the installation of the Application Server Java.

You can take one of the following approaches when using an external ABAP system as source for user data:

Approach	Advantages	Disadvantages
Each Java system uses different users	No interdependencies between the connected engines	Initially more administration to create the users in the ABAP system
All Java systems use the same configuration	You create the users only once and enter the same information for every Java system that you install.	Interdependencies between the connected engines: <ul style="list-style-type: none">• If you change the password of any of the users on the ABAP system, this change affects all connected engines.• If you change the administrator user's password, you must also change the password in secure storage on all of the connected Java EE Engines

→ Recommendation

For security reasons, we recommend the **first** approach.

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

More Information

For more information about AS ABAP user management as data source, see the SAP Library at:

SAP Release and SAP Library Quick Link	SAP Library Path (Continued)
<ul style="list-style-type: none">• SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4 http://help.sap.com/nw74• SAP NetWeaver 7.5 http://help.sap.com/nw75• SAP NetWeaver AS for ABAP 7.51 innovation package https://help.sap.com/nw751abap• SAP NetWeaver AS for ABAP 7.52 https://help.sap.com/nw752abap	<p>▶ <i>Application Help</i> ▶ <i>SAP NetWeaver Library: Function-Oriented View</i> ▶ <i>Security</i> ▶ <i>Identity Management</i> ▶ <i>User Management of SAP NetWeaver AS for Java</i></p> <p>▶ <i>Configuring User Management</i> ▶ <i>UME Data Sources</i> ▶ <i>User Management of Application Server ABAP as Data Source</i> ▶</p>

Procedure

- The following procedures describe the activities you have to perform in the existing ABAP system and for the Java system to be installed.
- Perform the following steps in the existing ABAP system:
 - a. Call transaction `PF03` to do the following:
 - Check that the roles `SAP_BC_JSF_COMMUNICATION` and `SAP_BC_JSF_COMMUNICATION_RO` exist and make sure that their profiles are generated.
 - Check that the roles `SAP_J2EE_ADMIN`, `SAP_J2EE_GUEST`, and `SAP_BC_FP_ICF` exist. Neither role contains any ABAP permissions, so you do not need to generate any profiles.
 - b. Call transaction `SU01` to do the following:
 - Create a new communication user and assign it to the role `SAP_BC_JSF_COMMUNICATION_RO`. We recommend that you do the following:
 - Name this user `SAPJSF`. You can use any password.
 - Assign this user the role `SAP_BC_JSF_COMMUNICATION_RO` for read-only (display) access to user data with Java tools. If you intend to maintain user data (that is, to change, create, or delete users) with Java tools, you need to assign the role `SAP_BC_JSF_COMMUNICATION` instead.
 - Assign this user the type *Communications* under *Logon data* to make sure that it can only be used for communication connections between systems and not as a dialog user.
 - Create a new administrator user for the J2EE engine and assign it to role `SAP_J2EE_ADMIN`. We recommend that you name this user `J2EE_ADM_<SAPSID_Java_System>`. You can use any password.
 - Create a new guest user for the J2EE engine and assign it to role `SAP_J2EE_GUEST`. We recommend that you name this user `J2EE_GST_<SAPSID_Java_System>`. You can use any password.
Since this user is only used for anonymous access to the system, we recommend you to deactivate the password and, if required, lock it after installation to prevent anyone from using it for explicit named logons.

- c. Make sure that you change the initial passwords of these users and take the precautions described in the relevant SAP security guide **before** you start the installation of the Java system. You can find the security guide in the *Security* section of the product page for your SAP product at <https://help.sap.com/>.
- Perform the following steps in the Java System:
 - a. **Before** the installation of the Java system, make sure that you have the correct user names and passwords of the users listed above for the separate ABAP system.
 - b. **During** the installation of the Java system, make sure that you enter the correct users and passwords in the corresponding software provisioning manager dialogs.

9.4 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.

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
2. Make sure that the `sapadm` user is created.

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

User and Groups of the SAP Host Agent

User	Primary Group	Additional Group	Comment
<code>sapadm</code>	<code>sapsys</code>	–	SAP Host Agent administrator

Note

If `sapadm` does not exist, it is created during the SAP Host Agent installation using `/bin/false` shell.

Make sure that `/bin/false` can be used as a login shell.

Only valid for 'Platform': AIX

AIX: Add `/bin/false` to the list of valid login shells (attribute `shells`) in `/etc/security/login.cfg`.

End of 'Platform': AIX

Groups and Members of the SAP Host Agent User









Groups	Members
<code>sapsys</code>	<code>sapadm</code>
<code>sapinst</code>	<code>sapadm</code>

3. Set up the required file system for the SAP Host Agent and make sure that the required disk space is available for the directories to be created during the installation.

For more information, see [Required File Systems and Directories \[page 76\]](#).

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 and Extracting the Software Provisioning Manager 1.0 Archive \[page 92\]](#).

5. Make the latest patch level of the `SAPHOSTAGENT <Version>.SAR` available on the host where you want to install the SAP Host Agent.






Download it from the following path: <https://launchpad.support.sap.com/#/softwarecenter>   
[SUPPORT PACKAGES & PATCHES](#)  [By Category](#)  [SAP Technology Components](#)  [SAP HOST AGENT](#)
[SAP HOST AGENT 7.22](#)  [Operating System](#) 

i Note

The digital signature of **installation archives** is checked **automatically** by the [software provisioning manager \[page 113\]](#) during the *Define Parameters* phase while processing the *Software Package Browser* screens. The software provisioning manager only accepts archives whose digital signature has been checked. After scanning the archives and verifying the digital signature, an info file is written where you can find detailed information about matching and non-matching archive files. You can access this info file by choosing the *info file* link in the Archive Scanning Result section of the *Software Package Browser* screen. The info file contains only the results of the latest archive scan.

→ Recommendation

It is highly recommended that you always choose the highest SP version of the `SAPHOSTAGENT<SP-version>.SAR` archive.

6. To install the SAP Host Agent, you [Running Software Provisioning Manager \[page 113\]](#) and choose  [Generic Options](#)  [Database](#)  [Preparations](#)  [SAP Host Agent](#)  on the *Welcome* screen of the software provisioning manager.
7. Follow the instructions on the software provisioning manager screens and enter the required parameters.
8. When the installation has finished, the software provisioning manager shows the message: Execution of SAP Host Agent has completed.

Post-Installation

9. Check that the SAP Host Agent is installed and running by entering this command:

```
/usr/sap/hostctrl/exe/saphostexec -status
```

If the SAP Host Agent is running, you see something like this:

```
saphostexec running (pid = 21942)
```

10. If the SAP Host Agent is installed but not running, enter the following:

```
/usr/sap/hostctrl/exe/saphostexec -restart
```

11. Check whether the installed services are available:

- a. Log on as a user with `root` authorizations.

i 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)

Next Steps

For more information about the SAP Host Agent, see the following documentation:

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/nw73SAP NetWeaver 7.3 including Enhancement Package 1 http://help.sap.com/nw731SAP NetWeaver 7.4 http://help.sap.com/nw74SAP 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>SAP Host Agent</i> ▶</p>

9.5 Starting and Stopping SAP System Instances

Start or stop SAP system instances in one of the following ways:

- [Using the SAP Management Console \(SAP MC\) \[page 172\]](#)
- [Using commands \[page 175\]](#).

9.5.1 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.

i Note

If your Web browser no longer supports Java applet technology, you can configure the SAP MC to run locally on your PC. For more information, see section *Configuring SAP MC locally* in SAP Note [1014480](#).

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 SAP Library at:

SAP Release and SAP Library Quick Link

SAP Library Path (Continued)

- | | |
|--|--|
| <ul style="list-style-type: none"> • SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4
http://help.sap.com/nw74 • SAP NetWeaver 7.5
http://help.sap.com/nw75 • SAP NetWeaver AS for ABAP 7.52
https://help.sap.com/nw752abap | <p>▶ Application Help ▶ Function-Oriented View ▶ Solution Life Cycle Management ▶ SAP Management Console ▶</p> |
|--|--|

- 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 SAP Library at:

Release SAP Library Quick Link

SAP Library Path (Continued)

- | | |
|--|---|
| <ul style="list-style-type: none"> • SAP Solution Manager 7.2 SR2 only: SAP NetWeaver 7.4
http://help.sap.com/nw74 • SAP NetWeaver 7.5
http://help.sap.com/nw75 | <p>▶ Application Help ▶ Function-Oriented View ▶ Solution Life Cycle Management ▶ SAP Microsoft Management Console: Windows ▶</p> |
|--|---|

Only valid for 'Platform': Linux

i Note

Linux only: If your server runs on a Linux distribution using systemd version 234 or later, it's technically possible that you use systemd commands on operating system level to start and stop SAP systems. However, we recommend that you **do not** use these systemd commands. For example, using systemd to restart or stop the systemd unit will not only stop the start service, but the entire related SAP instance

with time limits for the processes to shut down. This might end in unexpected results. To start and stop SAP instances, we recommend that you use the SAP Management Console, as outlined here, or the `sapcontrol` commands (see also [Starting and Stopping SAP System Instances Using Commands \[page 175\]](#)). For more information about `systemd`, see SAP Note [3139184](#).

End of 'Platform': Linux

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.

i 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 central services instance `SCS<Instance_Number>`.
3. Start the primary application server instance `J<Instance_Number>`.
4. Start additional application server instances `J<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 `J<Instance_Number>`, if there are any.
2. Stop the primary application server instance `J<Instance_Number>`.
3. Stop the central services instance `SCS<Instance_Number>`.
4. Stop the database instance.

9.5.2 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](#).

Only valid for 'Platform': Linux

Linux only: If your server runs on a Linux distribution using systemd version 234 or later, it's technically possible that you use systemd commands on operating system level to start and stop SAP systems. However, we recommend that you **do not** use these systemd commands. For example, using systemd to restart or stop the systemd unit will not only stop the start service, but the entire related SAP instance with time limits for the processes to shut down. This might end in unexpected results. To start and stop SAP instances, we recommend that you use the `sapcontrol` commands or the SAP Management Console (see also [Starting and Stopping SAP System Instances Using the SAP Management Console \[page 172\]](#)). For more information about systemd, see SAP Note [3139184](#).

End of 'Platform': Linux

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:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol --help
```

❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol --help
```

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):

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-function StartSystem
```

❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 01 -function StartSystem
```

- Starting an SAP System Instance

You can start an SAP system instance by executing the following commands from the command line:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-function Start
```

❖ Example

Starting an instance with `<instance_number>` 02: `/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -function Start`

For remote instances, the syntax is slightly different, because you also have to apply the `-host` and `-user` parameters:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-host <remote host> -user <sapsid>adm <password> -function Start
```

❖ Example

Starting a remote instance with `<instance_number>` 02: `/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -host myremotehost -user gbladm -function Start`

• 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):

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>
-function StopSystem
```

❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 01 -function StopSystem
```

• Stopping an SAP System Instance

You can stop an SAP system instance by executing the following commands from the command line:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>
-function Stop
```

❖ Example

```
Stopping an instance with <instance_number> 02: /usr/sap/GB1/D00/exe/sapcontrol
-nr 02 -function Stop
```

For remote instances, the syntax is slightly different, because you also have to apply the `-host` and `-user` parameters:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>
-host <remote host> -user <sapsid>adm <password> -function Stop
```

❖ Example

```
Stopping a remote instance with <instance_number> 02: /usr/sap/GB1/D00/exe/
sapcontrol -nr 02 -host myremotehost -user gbladm -function Stop
```

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

• 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):

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>
-host <remote host> -user <sapsid>adm <password> -function
GetSystemInstanceList
```

❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -host myremotehost -user gbladm  
-function GetSystemInstanceList
```

- With the following command you get a list of instance processes and their status:

```
/usr/sap/<SAPSID>/<INSTANCE><NUMBER>/exe/sapcontrol -nr <instance_number>  
-host <remote host> -user <sapsid>adm <password> -function GetProcessList
```

❖ Example

```
/usr/sap/GB1/D00/exe/sapcontrol -nr 02 -host myremotehost -user gbladm  
-function GetProcessList
```

- **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.

9.6 Creating a User for LDAP Directory Access

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.

⚠ Caution

SAP recommends that you no longer use the LDAP configuration options provided by the software provisioning manager, because current security guidelines make it unsafe to run SAP applications on a domain controller. Instead, SAP recommends that you follow the instructions in SAP Note [3251648](#) to enable LDAP directory service integration of your SAP system with Active Directory.

Prerequisites

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

Context

For more information, see [Integration of LDAP Directory Services \[page 162\]](#).

Procedure

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

9.7 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

9.8 Enabling SSL Encrypted Data Transfer

Secure Sockets Layer (SSL) encrypted data transfer is available for SAP ASE 16.0 SP02 starting with PL6.

For general limitations and prerequisites refer to SAP Note [2481596](#) - SYB: Encrypted data transfer between SAP system and SAP ASE database.

The software provisioning manager offers the possibility to enable the SSL encrypted data transfer via a checkbox. The SSL certificates are generated by the software provisioning manager and enabled for the database server and the SAP application server.

There are no manual steps necessary to configure the usage of SSL for the purpose of encrypted data transfer.

i Note

The software provisioning manager adds the profile parameter `db/s/syb/ssl = 1` to the SAP System DEFAULT profile and configures the environment variable `db_syb_ssl = 1` for the OS user `<sid>adm`.

The SAP ASE interface file contains the keyword `ssl` in the TCP/IP connection string.

9.9 Uninstalling an SAP System or Single Instances

This section describes how to uninstall a complete SAP system or single SAP instances with the *Uninstall* option of the software provisioning manager.

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

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 software provisioning manager. 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.
- 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 software provisioning manager as described in [Running Software Provisioning Manager \[page 113\]](#).
2. On the *Welcome* screen, choose:
▶ *Generic Installation Options* ▶ *<Database>* ▶ *Uninstall* ▶ *Uninstall SAP Systems or Single Instances* ▶
3. Follow the instructions on the software provisioning manager screens to delete a complete SAP system or single instances.

i Note

To find more information on each parameter during the *Define Parameters* phase, position the cursor on the required parameter input field, and choose either or the *HELP* tab. Then the available help text is displayed in the *HELP* tab.

The following table provides information about deleting a complete system or single instances with the software provisioning manager.

Deletion of	Remarks
Standard system	You can delete a standard system (where all instances reside on the same host) in one software provisioning manager run.
Distributed or high-availability system	If you want to delete a distributed or high-availability system, you have to run the software provisioning manager to delete the required instances locally on each of the hosts belonging to the SAP system in the following sequence:

⚠ Caution

Only select checkbox *Uninstall all instances of the SAP system from this host* when removing the last remaining instance of the SAP system. Otherwise the contents of mounted global directories under */ <sapmnt> / <SAPSID>* / such as instance profiles and kernel executables, are also deleted.

1. Additional application server instances, if there are any
2. Primary application server instance
3. Database instance
Since the software provisioning manager 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 software provisioning manager parameters for the deletion of the database instance.
4. Central services instance (SCS)

i Note

To delete system directories mounted from an NFS server, you have to run the software provisioning manager on the NFS server.

Deletion of	Remarks
Additional application server	If you want to delete additional application server instances of an existing SAP system, you have to run the software provisioning manager to delete them locally on each additional application server instance host.
Standalone SAP Host Agent	The SAP Host Agent is automatically uninstalled from a host together with the last remaining SAP system instance. 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.

4. When you have finished, delete the relevant directory structure on the global host.
5. 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.
6. To remove obsolete SLD data, see the following document: <https://wiki.scn.sap.com/wiki/display/SL/More+on+System+Landscape+Directory> ► [How-to Manage House-Cleaning in the System Landscape Directory - Duplicate System Entries](#) ►

A Appendix

A.1 Online Information from SAP

More information is available online as follows:



Titel	Internet Address
<i>Database Administration Guide: SAP Applications on SAP Adaptive Server Enterprise</i>	https://help.sap.com/viewer/ase_admin
<i>Security Guide for SAP Application on SAP Adaptive Server Enterprise</i>	https://help.sap.com/viewer/ase_security

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