Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 to 7.5x on UNIX: SAP HANA Database
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Document History

**Note**

Before you start the implementation, make sure you have the latest version of this document, which is available at [https://support.sap.com/sitoolset System Provisioning Installation Option of Software Provisioning Manager](https://support.sap.com/sitoolset).

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

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9.1</td>
<td>2018-02-12</td>
<td>Updated version for software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td>Version</td>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2.9</td>
<td>2018-01-15</td>
<td>Updated version for software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New Features:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Signature check for installation archives, documented in: 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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Installer Log Files Improvements, documented in: New Features, Useful Information about the Installer, Troubleshooting with the Installer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Secure ABAP message server connection, documented in: New Features, SAP System Parameters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Enabling IPv6, documented in: New Features, Prerequisites for Running the Installer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New Features section restructured: As of SP22, a dedicated subsection for each new SP has been created. New features below SP22 remain in a common table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The Java SDT GUI - which was in the SP21 version still available in parallel to the SL Common GUI - has been deprecated with SP22. As of SP22, SL Common GUI is the only available installer GUI:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ The following sections which were explicitly related to Java SDT GUI were completely removed from this documentation: Performing a Remote Installation Remote Processing of the Installer (Java SDT GUI only), Starting the Java SDT GUI Separately, Running the Installer in Accessibility Mode (general accessibility information was moved to Useful Information About the Installer).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ The Java SDT GUI-specific information was removed from the common installer sections: Running the Installer, Useful Information About the Installer, Interrupted Processing of the Installer, Troubleshooting with the Installer, Deleting an SAP System or Single Instances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New section Using the Step State Editor (SAP Support Experts Only) was added to section Additional Information About the Installer</td>
</tr>
<tr>
<td>Version</td>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 2.8     | 2017-09-11 | Updated version for software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)  
   - New Features:  
     ○ Media Signature Check, documented in: New Features, Running the Installer, Preparing the Installation Media.  
     This feature implies that section Creating Kernel Archives from an Existing SAP System has been deleted from this documentation because the related option in the installer had to be removed.  
     ○ Download Media for a Maintenance Plan, documented in: New Features, Downloading Media for a Maintenance Plan  
     ○ SAP Host Agent Upgrade, documented in: New Features, SAP System Parameters, Downloading SAP Kernel Archives (Archive-Based Installation)  
     ○ Load tools are now available as LOADTOOLS.SAR in the Software Provisioning Manager archive, documented in: New Features, Downloading and Extracting the Software Provisioning Manager Archive  
     ○ Simplified additional application server instance installation, documented in: New Features, Preparing the Installation Media, Downloading SAP Kernel Archives (Archive-Based Installation) |
| 2.7     | 2017-05-22 | Updated version for software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)  
   - New Features:  
     ○ New SAPUI5-based graphical user interface (GUI) "SL Common GUI", documented in: Prerequisites for Running the Installer, Running the Installer, Useful Information About the Installer  
     ○ Option for choosing to install an integrated SAP Gateway during the ASCS instance installation, documented in: Installation Options Covered by this Guide, SAP System Parameters, Parameters for Additional Components to be Included in the ASCS Instance, Post-Installation Checklist, SAP Gateway Configuration  
     ○ Cleanup of operating system users, documented in: SAP System Parameters, Creating Operating System Users and Groups |
| 2.6     | 2017-02-07 | Updated version for software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19):  
   - New Features:  
     Verification of the integrity of data units in Software Provisioning Manager, documented in: New Features, Downloading the Software Provisioning Manager Archive  
     Archive-based Language Installation, documented in: Additional Parameters When Using a Stack Configuration File |
<table>
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<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2.5     | 2016-10-07 | Updated version for software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18):  
● New Features:  
  - Option to choose installing an integrated SAP Web Dispatcher during the ASCS instance installation, documented in: ASCS Instance with Integrated SAP Web Dispatcher [page 29].  
  - Using RMOSSWPM* .SAR instead of SWPM* .SAR for outdated OS versions not supported by SAP kernel 7.40 and higher, documented in: Introduction Constraints |
| 2.4     | 2016-06-06 | Updated version for software provisioning manager 1.0 SP17 (SL Toolset 1.0 SP17):  
● New Features:  
  - " Archive-Based Installation", documented in:  
    ○ New Features [page 15]  
    ○ Preparing the Installation Media [page 91] Downloading Specific Installation Archives (Archive-Based Installation) |
| 2.3     | 2016-02-15 | Updated version for software provisioning manager 1.0 SP10 (SL Toolset 1.0 SP16)                                                                                                                         |
| 2.2     | 2015-10-12 | Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)                                                                                                                         |
| 2.1     | 2015-09-14 | Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)                                                                                                                         |
| 2.0     | 2015-04-27 | Updated version for software provisioning manager 1.0 SP08 (SL Toolset 1.0 SP13)                                                                                                                         |
| 1.9     | 2014-11-24 | Updated version for software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)                                                                                                                         |
| 1.8     | 2014-07-07 | Updated version  
  Instead of a separate installation guide for each UNIX-based operating system, we now deliver a single installation guide for all UNIX-based operating systems. Sections that are only relevant for one or more specific operating systems are highlighted accordingly. |
| 1.7     | 2014-03-17 | Updated version                                                                                                                                                                                            |
| 1.6     | 2013-10-28 | Updated version                                                                                                                                                                                            |
1 About this Document

This installation guide describes how to install an SAP system based on the application server ABAP of SAP NetWeaver 7.3 to 7.5x using the installation tool Software Provisioning Manager 1.0 SP22 ("installer" for short), which is part of SL Toolset 1.0 SP22.

**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/lama.

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

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

**Caution**

Make sure you have read Before You Start [page 11] before you continue with this installation guide.

The SAP HANA database is normally part of the SAP HANA appliance. It is normally pre-installed by SAP partners before you start the installation. For more information about how to install the SAP HANA database, see the SAP HANA Server Installation and Update Guide at https://help.sap.com/hana_platform. During the installation of the SAP system, Software Provisioning Manager (the "installer") accesses the SAP HANA database remotely to perform the necessary database-specific installation steps.

**Note**

However, if you are installing a standard system [page 22] on Linux, you can now install SAP systems based on SAP NetWeaver 7.4 on the same host as the SAP HANA database. In this case, you must make sure that you include the RAM requirements for the SAP HANA database instance. For more information, see SAP Note 1953429. This scenario is not described in detail in this guide.

**For SCM only:** If you want to use liveCache on SAP HANA, you must install the LCAPPS package on the database server. For more information, see the Application Operations Guide at https://help.sap.com/scm.

**Related Information**

- Naming Conventions [page 10]
- Constraints [page 11]
1.1 Naming Conventions

- 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 91].

  This way, you automatically get the latest version with the latest fixes of the tool and supported processes. For more information about 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.

  “SAPinst” has been renamed to “Software Provisioning Manager” (“installer” for short) in this documentation, but the terms “SAPinst” and “sapinst” are still used in:

  - The name of the technical framework of Software Provisioning Manager. For more information about the SAPinst Framework, see SAP Note 2393060.
  - Texts and screen elements in the Software Provisioning Manager GUI
  - Names of executables, for example sapinst
  - Names of command line parameters, for example SAPINST_USE_HOSTNAME
  - 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 SAP systems based on SAP NetWeaver 7.3 including enhancement package 1 and higher. For more information, see SAP Note 1970349. Note that there is no terminology change for older releases and all mentioned terms can be used as synonyms. As this guide is a generic document, the currently used terms remain but only “product instance” is used from now on when referring to SAP NetWeaver 7.3 EHP1 and higher.

  For more information, see New Features [page 15].

- “installer” refers to “Software Provisioning Manager”.

- “SAP system” refers to SAP system based on the application server of SAP NetWeaver 7.3 / 7.3 including Enhancement Package 1 / SAP NetWeaver Application Server for ABAP 7.4 / SAP NetWeaver 7.4 / SAP NetWeaver 7.5 / SAP NetWeaver Application Server for ABAP 7.51 innovation packageSAP NetWeaver Application Server for ABAP 7.52.

- “ABAP system” refers to SAP NetWeaver 7.3 / 7.3 including Enhancement Package 1 / SAP NetWeaver Application Server for ABAP 7.4 / SAP NetWeaver 7.4 / SAP NetWeaver 7.5 / 7.4 SR1 / SAP NetWeaver 7.5 / SAP NetWeaver Application Server for ABAP 7.51 innovation packageSAP NetWeaver Application Server for ABAP 7.52.

- “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.
1.2 Constraints

- 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 SAP Note 1680045 to ensure that the installation options you want to perform are already supported. For information about supported operating system and database platforms, see the Product Availability Matrix at http://support.sap.com/pam.

- Note that a complete system installation from scratch is not available for every product. For some products - such as SAP NetWeaver 7.4 - a complete new system installation from scratch is only provided for the highest support release. If there are one or more support releases, then a complete system installation is only available for the highest of these support releases. As for the lower support releases, only options for system copy and additional application server instances are provided.

- Your operating system platform must be 64-bit.

- The *startsap* and *stopsap* commands have been deprecated. For more information and for information on alternatives, see Starting and Stopping SAP System Instances Using Commands [page 184].

- Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5 or higher. For more information, see SAP Note 1749142.

- Client 001 is no longer available in newly installed SAP systems based on SAP S/4HANA and SAP BW/4HANA.

1.3 Before You Start

Make sure that you have read the release-specific “Master Guide” - also called “Installation Guide” for SAP S/4HANA - for your SAP Business Suite application, SAP NetWeaver application, or SAP Solution Manager system before you continue with this installation guide.

The “Master Guide” - also called “Installation Guide” for SAP S/4HANA - 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” - or “Installation 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:

<table>
<thead>
<tr>
<th>Document</th>
<th>Internet Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Guide – SAP Solution Manager 7.2</td>
<td><a href="http://help.sap.com/solutionmanager">http://help.sap.com/solutionmanager</a>&lt;SP&gt; 7.2 Installation and Upgrade</td>
</tr>
</tbody>
</table>
1.4 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

<table>
<thead>
<tr>
<th>SAP Note Number</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1680045</td>
<td>Release Note for Software Provisioning Manager 1.0</td>
<td>Software Provisioning Manager 1.0 with installation and system copy for SAP NetWeaver-based systems</td>
</tr>
<tr>
<td>2378874</td>
<td>Install SAP Solutions on Linux on IBM Power Systems (little endian)</td>
<td>Information about how to install SAP solutions on Linux on IBM Power Systems (little endian)</td>
</tr>
<tr>
<td>2365849</td>
<td>Installation of SAP Systems Based on SAP NetWeaver: SAP HANA Database</td>
<td>Platform-specific information about the SAP system installation and corrections to this documentation</td>
</tr>
<tr>
<td>1830427</td>
<td>Installation of SCM on HANA with integrated liveCache</td>
<td>This SAP Note contains information that is specific to the SAP system installation of SCM on HANA with integrated liveCache</td>
</tr>
<tr>
<td>73606</td>
<td>Supported Languages and Code Pages</td>
<td>Information on possible languages and language combinations in SAP systems</td>
</tr>
<tr>
<td>1972803</td>
<td>SAP on AIX: Recommendations</td>
<td>This SAP Note contains recommendations and clarifications for many topics relevant for SAP on AIX.</td>
</tr>
<tr>
<td>SAP Note Number</td>
<td>Title</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1075118</td>
<td>SAP on HP-UX: FAQ</td>
<td>This SAP Note contains information that is specific to the SAP system installation on HP-UX</td>
</tr>
<tr>
<td>2369910</td>
<td>SAP Software on Linux: General information</td>
<td>This SAP Note contains Linux-specific information about the SAP system installation</td>
</tr>
<tr>
<td>1669684</td>
<td>SAP on Oracle Solaris 11</td>
<td>This SAP Note contains information and references to SAP Notes relevant for Solaris 11</td>
</tr>
<tr>
<td>1067221</td>
<td>Composite SAP Note for heterogeneous installation</td>
<td>This SAP Note and its related SAP Notes describe the released operating system and database combinations for heterogeneous SAP systems landscapes.</td>
</tr>
<tr>
<td>789220</td>
<td>Support Package levels for SAP NetWeaver installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP NetWeaver release</td>
</tr>
<tr>
<td>819722</td>
<td>Support Package levels for SRM installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP SRM release</td>
</tr>
<tr>
<td>774615</td>
<td>Support Package levels of ERP/ECC installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP ERP release</td>
</tr>
<tr>
<td>837413</td>
<td>Support Package levels for CRM installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP CRM release</td>
</tr>
<tr>
<td>850038</td>
<td>Support Package levels for SCM/APO installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP SCM release</td>
</tr>
<tr>
<td>1990240</td>
<td>Support of mixed landscapes (Unicode and Non-Unicode)</td>
<td>Temporarily your system landscape is mixed with Unicode and Non-Unicode systems. You have third party software in your system landscape which does not support Unicode at all. You wonder whether such a heterogeneous system landscape is supported without restrictions.</td>
</tr>
</tbody>
</table>
1.5  New Features

The sections below provide an overview of the new features in Software Provisioning Manager 1.0 (the “installer” for short).


New Features - Software Provisioning Manager 1.0 SP22 [page 15]

The table in this section provides an overview of the new features in Software Provisioning Manager 1.0 available as of SP22 (SL Toolset 1.0 SP22).

New Features - Software Provisioning Manager 1.0 SP21 and Lower [page 16]

The table in this section provides an overview of the new features in Software Provisioning Manager 1.0 available as of SP21 (SL Toolset 1.0 SP21) and lower.

1.5.1 New Features - Software Provisioning Manager 1.0 SP22

The table in this section provides an overview of the new features in Software Provisioning Manager 1.0 available as of SP22 (SL Toolset 1.0 SP22).


<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure ABAP Message Server Connection</td>
<td>The installer now uses secure connections to the ABAP message server of the SAP system being installed. For more information, see the ABAP Message Server Port entry within the Ports table in SAP System Parameters [page 53].</td>
</tr>
<tr>
<td>Installer Log Files Improvements</td>
<td>Installer log files are now available immediately after the installer has been started, that is before a product has been selected on the Welcome screen. For more information, see Useful Information About the Installer [page 120] and Troubleshooting with the Installer [page 125].</td>
</tr>
<tr>
<td>Signature Check of Installation Archives</td>
<td>The signature of installation archives is checked automatically by the installer during the Define Parameters phase while processing the Software Package Browser screens. As of now the installer only accepts archives whose signature has been checked. For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 97].</td>
</tr>
</tbody>
</table>
LOADTOOLS.SAR archive in Software Provisioning Manager enabled for NUC

The load tools in SWPM10SP<Support_Package_Number>_ <Version_Number>.SAR are now also enabled for an installation using non-Unicode (NUC) kernel version 7.40 or higher.

For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 93].

Note

This feature enhances feature LOADTOOLS.SAR archive in Software Provisioning Manager 1 of Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21) (see entry LOADTOOLS.SAR archive in Software Provisioning Manager in New Features - Software Provisioning Manager 1.0 SP21 and Lower [page 16]).

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 the Installer [page 111].

1.5.2 New Features - Software Provisioning Manager 1.0 SP21 and Lower

The table in this section provides an overview of the new features in Software Provisioning Manager 1.0 available as of SP21 (SL Toolset 1.0 SP21) and lower.


<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Signature Check</td>
<td>The signature of media is checked automatically by the installer during the Define Parameters phase while processing the Media Browser screens. As of now the installer only accepts media whose signature has been checked. See also the description of this new security feature in SAP Note 2393060. For more information, see Preparing the Installation Media [page 91] and Running the Installer [page 114].</td>
<td>Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td><strong>SAP Host Agent Upgrade During the Installation (Optional)</strong></td>
<td>During the <strong>Define Parameters</strong> phase of the installation, the installer 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 <strong>General Parameters</strong> table in <strong>SAP System Parameters [page 53]</strong>.</td>
<td><strong>Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)</strong></td>
</tr>
<tr>
<td><strong>Simplified Additional Application Server Instance Installation</strong></td>
<td>During an additional application server installation, kernel archives are only prompted if they cannot be retrieved from the primary application server instance of the existing SAP system. For more information, see <strong>Preparing the Installation Media [page 91]</strong>.</td>
<td><strong>Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)</strong></td>
</tr>
<tr>
<td><strong>LOADTOOLS.SAR archive in Software Provisioning Manager</strong></td>
<td>An up-to-date version of the load tools - such as <strong>R3load</strong>, <strong>R3szchk</strong>, <strong>R3ldctl</strong>, <strong>SAPuptool</strong> - which were available so far only in the <strong>SAPEXEDB.SAR</strong> archive of the kernel media, has now been made available in the Software Provisioning Manager archive. For an installation using Unicode kernel version 7.40 or higher, the load tools from the <strong>SWPM10SP_&lt;Support_Package_Number&gt;_&lt;Version_Number&gt;.SAR</strong> are used automatically. For more information, see <strong>Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 93]</strong>.</td>
<td><strong>Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)</strong></td>
</tr>
<tr>
<td><strong>SL Common GUI with SAPINST 7.49</strong></td>
<td>With the new installer framework version SAPINST 7.49, you can now use the new SAPUI5-based graphical user interface (GUI) “<strong>SL Common GUI</strong>”. For more information, see <strong>Useful Information About the Installer [page 120]</strong>, <strong>Running the Installer [page 114]</strong>.</td>
<td><strong>Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)</strong></td>
</tr>
<tr>
<td><strong>Cleanup of Operating System Users</strong></td>
<td>You can now specify during the <strong>Define Parameters</strong> phase that the operating system users are to be removed from group <strong>sapinst</strong> after the execution of the installer has completed. For more information, see <strong>Operating System Users in SAP System Parameters [page 53]</strong>.</td>
<td><strong>Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)</strong></td>
</tr>
<tr>
<td><strong>Option to install an SAP Gateway in an ASCS instance</strong></td>
<td>You can now install an SAP Gateway in an ASCS instance. You can choose this option while running the ASCS instance installation. For more information, see <strong>ASCS Instance with Integrated Gateway [page 31]</strong>.</td>
<td><strong>Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)</strong></td>
</tr>
<tr>
<td><strong>Verification of Integrity of Data Units in Software Provisioning Manager</strong></td>
<td>The integrity of data units extracted from the Software Provisioning Manager archive is verified. For more information, see <strong>Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 93]</strong>. In addition, check SAP Note <strong>1680045</strong> whether additional information is available.</td>
<td><strong>Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)</strong></td>
</tr>
<tr>
<td><strong>Support of Linux on IBM Power Systems (little endian)</strong></td>
<td>Software Provisioning Manager supports as of now Linux on IBM Power Systems (little endian) as operating system platform for SAP systems based on SAP NetWeaver 7.5 and higher. For more information, see SAP Note <strong>2378874</strong>.</td>
<td><strong>Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)</strong></td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Archive-based Language Installation</td>
<td>If you perform an installation using a stack configuration file, you can now add language archives to the download basket and use them for language installation. This feature is currently restricted to the latest products only. For more information, see Additional Parameters When Using a Stack Configuration File (Optional) [page 64]</td>
<td>Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)</td>
</tr>
<tr>
<td>Option to install an SAP Web Dispatcher in an ASCS instance</td>
<td>You can now install an SAP Web Dispatcher in an ASCS instance. You can choose this option while running the ASCS instance installation. For more information, see ASCS instance with Integrated SAP Web Dispatcher [page 29]</td>
<td>Software Provisioning Manager 1.0 SP18 (SL Toolset 1.0 SP18)</td>
</tr>
<tr>
<td>Archive-Based Installation</td>
<td>You can now download the required installation archives instead of the complete SAP kernel installation media. For more information, see section Downloading Specific Installation Archives (Archive-Based Installation) in Preparing the Installation Media [page 91].</td>
<td>Software Provisioning Manager 1.0 SP17 (SL Toolset 1.0 SP17)</td>
</tr>
<tr>
<td>Diagnostics Agent</td>
<td>The Diagnostics Agent is no longer installed automatically with the SAP system. The Install Diagnostics Agent check box on the Install Diagnostics Agent screen is no longer available. 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). 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 Diagnostics Agent Setup Guide.</td>
<td>Software Provisioning Manager 1.0 SP10 (SL Toolset 1.0 SP16)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| System Provisioning for SAP NetWeaver 7.5 and SAP NetWeaver 7.5-based Products | All system provisioning tasks (installation, system copy, system rename) are available for the new SAP NetWeaver 7.5 release. 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.  
  - After upgrading to SAP NetWeaver 7.5 PI, you first have to split the still existing dual stack-system before you can use SAP NetWeaver 7.5 PI productively.  
  - For more information, see the Upgrade Master Guide - SAP NetWeaver 7.5 at: [http://help.sap.com/nw75](http://help.sap.com/nw75) | Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP15) |
<p>| Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP15) | | |
| Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 to 7.5x on UNIX: SAP HANA Database | | |</p>
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating Kernel Archives from existing SAP System</td>
<td>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.</td>
<td>Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP14)</td>
</tr>
<tr>
<td>Note</td>
<td>This feature is only available for Unicode systems.</td>
<td></td>
</tr>
<tr>
<td>Caution</td>
<td>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 Welcome 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.</td>
<td></td>
</tr>
<tr>
<td>Usage Type Library Deprecation for SAP Systems Based on SAP NetWeaver 7.3 EHP1 and Higher</td>
<td>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.</td>
<td>Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
<tr>
<td>Installation Using a Stack Configuration File</td>
<td>You can start the installer using a stack configuration file generated by the Maintenance Planner. The configuration parameters in this file can then be used by the installer to improve the integration with SUM and to simplify the process of installation for a new system on target software level. For more information, see Installation Using a Stack Configuration File (Optional) [page 36].</td>
<td>Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
<tr>
<td>Adaptive Installation</td>
<td>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.</td>
<td>Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
</tbody>
</table>
### Feedback Evaluation Form

SAP SE’s aim is to provide fast and efficient procedures. To evaluate the procedure you just carried out, we need information generated by the tool during process execution and your experience with the tool itself. A new evaluation form contains a simple questionnaire and XML data generated during the procedure. Port 4239 is used for displaying the feedback evaluation form. For more information, see [Prerequisites for Running the Installer](page 111).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback Evaluation Form</td>
<td>SAP SE’s aim is to provide fast and efficient procedures. To evaluate the procedure you just carried out, we need information generated by the tool during process execution and your experience with the tool itself. A new evaluation form contains a simple questionnaire and XML data generated during the procedure. Port 4239 is used for displaying the feedback evaluation form. For more information, see [Prerequisites for Running the Installer](page 111).</td>
<td>Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
<tr>
<td>Option Verify Signed Media</td>
<td>The digital signature ensures that the signatory of a digital document can be identified unambiguously and signatory’s name is documented together with the signed document, the date, and the time. For more information, see SAP Note 1979965.</td>
<td>Software Provisioning Manager 1.0 SP06 (SL Toolset 1.0 SP11)</td>
</tr>
<tr>
<td>Installation of SAP systems on the same host as the SAP HANA database</td>
<td>You can now install SAP systems based on SAP NetWeaver Application Server for ABAP 7.4 on the same host as the SAP HANA database, without applying additional environment settings. For more information, see SAP Note 1953429. This scenario is not described in detail in this guide.</td>
<td>Software Provisioning Manager 1.0 SP06 (SL Toolset 1.0 SP11)</td>
</tr>
</tbody>
</table>
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.

i Note

Regardless of whether you are installing a standard, distributed, or high-availability system, the SAP HANA database is normally installed on a dedicated database server. It is normally pre-installed by SAP partners before you start the installation of the SAP system instances. During the installation of the SAP system, Software Provisioning Manager (the “installer”) accesses the SAP HANA database remotely to perform the necessary database-specific installation steps.

However, if you are installing a standard system on Linux, you can install SAP systems based on SAP NetWeaver Application Server for ABAP 7.4 or higher on the same host as the SAP HANA database, without applying additional environment settings. For more information, see SAP Note 1953429.

For more information about how to install the SAP HANA database, see the SAP HANA Server Installation and Update Guide at https://help.sap.com/hana_platform Installation and Upgrade.

After you have decided on the installation option that you want to use, continue with Planning [page 34].

Related Information

Standard System [page 22]
Distributed System [page 24]
High-Availability System [page 25]
Additional Application Server Instance [page 26]
ASCS Instance with Integrated SAP Web Dispatcher [page 29]
ASCS Instance with Integrated Gateway [page 31]
SAP Host Agent as a Separate Installation [page 32]

2.1 Standard System

In a standard system, all main instances except the SAP HANA database instance run on a single host. There are the following instances:

- ABAP Central services instance (ASCS instance)
Optionally, you can install the ASCS instance with an integrated SAP Web Dispatcher. For more information, see ASCS Instance with Integrated SAP Web Dispatcher [page 29].

Optionally, you can install the ASCS instance with an integrated gateway. For more information, see ASCS Instance with Integrated Gateway [page 31].

- SAP HANA database instance (DB)
- Primary application server instance (PAS instance)

**Note**

If you are installing a standard system on Linux, you can install SAP systems based on SAP NetWeaver Application Server for ABAP 7.4 or higher on the same host as the SAP HANA database, without applying additional environment settings, as shown in the figure below. For more information, see SAP Note 1953429 📝. This scenario is not described in detail in this guide.
2.2 Distributed System

You can install a system distributed over several hosts.

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

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

- **ABAP Central services instance (ASCS instance)**
  - Optionally, you can install the ASCS instance with an integrated SAP Web Dispatcher. For more information, see *ASCS Instance with Integrated SAP Web Dispatcher* [page 29].
  - Optionally, you can install the ASCS instance with an integrated gateway. For more information, see *ASCS Instance with Integrated Gateway* [page 31].
- **SAP HANA database instance (DB)**
  - The ABAP stack uses its own database schema in the database.
- **Primary application server instance (PAS)**

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

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

Optionally, you can install one or more additional application server instances. For more information, see *Installation of an Additional Application Server Instance* [page 26].
2.3 High-Availability System

Note

SAP HANA can also have HA solutions. For more information contact your hardware partner and see the SAP HANA overview in the SAP HANA Data Center, which is available at http://www.saphana.com/docs/DOC-2010.

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

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

There are the following instances:

- ABAP Central services instance (ASCS instance)
  - Optionally you can install the ASCS instance with an integrated SAP Web Dispatcher. For more information, see ASCS Instance with Integrated SAP Web Dispatcher [page 29].
  - Optionally you can install the ASCS instance with an integrated gateway. For more information, see ASCS Instance with Integrated Gateway [page 31].
- Enqueue replication server instance (ERS instance) for the ASCS instance (mandatory)
- SAP HANA database instance (DB)
- Primary application server instance (PAS)

The graphics below assume that you run the ASCS instance on the switchover cluster infrastructure. However, you can also run other SAP system instances that are a single point of failure (SPOF) on a switchover cluster infrastructure, for example the database instance.
You can also use the SAP transport host or the host with the global file system (SAP global host) as your primary application server instance host.

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

To increase high availability by creating redundancy, we recommend that you install additional application server instances on hosts different from the primary application server instance host. For more information, see Installation of an Additional Application Server Instance [page 26].

The following figures show examples for the distribution of the SAP 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

**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 176]. 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 where the primary application server instance runs
- On dedicated hosts

For more information, see Standard System [page 22].

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 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
Additional Application Server Instance for a High-Availability System

For more information, see High-Availability System [page 25].

2.5 ASCS Instance with Integrated SAP Web Dispatcher

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

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

Note

We only recommend this option for special scenarios. For more information, see SAP Note 908097. For an SAP Web Dispatcher installation, a standalone installation (see below) continues to be the default scenario.
The SAP Web Dispatcher is located between the Web client (browser) and your SAP system that is running the Web application.

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

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

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

If you want to install an SAP Web Dispatcher for another system - that is not for the system for which you use the ASCS instance and with its own SAP system ID and instance number - you have to install SAP Web Dispatcher separately as described in the documentation which you can find under [http://support.sap.com/sitoolset](http://support.sap.com/sitoolset) ➔ System Provisioning ➔ Installation Option of Software Provisioning Manager ➔ Guide for SAP Web Dispatcher for SAP NetWeaver 7.0 or Higher ➔
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:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quicklink</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3</td>
<td>Application Help Function-Oriented View Application Server Infrastructure Components of SAP NetWeaver Application Server SAP Web Dispatcher</td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td><a href="http://help.sap.com/nw731abap">http://help.sap.com/nw731abap</a></td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td><a href="http://help.sap.com/nw74abap">http://help.sap.com/nw74abap</a></td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td><a href="http://help.sap.com/nw75abap">http://help.sap.com/nw75abap</a></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
</tr>
</tbody>
</table>

Related Information

Parameters for Additional Components to be Included in the ASCS Instance (Optional) [page 66]

2.6 ASCS Instance with Integrated Gateway

You can install a gateway integrated in the ASCS instance.

If you select this option, a gateway is installed within the ASCS instance.

Note

No separate standalone gateway instance and no dedicated <SAPSID> are created for the gateway.
The gateway enables communication between work processes and external programs, as well as communication between work processes from different instances or SAP systems.

You can also install a standalone gateway instance. For more information, see the documentation Installation Guide – Installation of a Standalone Gateway Instance for SAP Systems Based on SAP NetWeaver <Release> at http://support.sap.com/sitoolset System Provisioning Installation Option.

Related Information

Parameters for Additional Components to be Included in the ASCS Instance (Optional) [page 66]

2.7 SAP Host Agent as a Separate Installation

Under certain circumstances you need to install SAP Host Agent separately.

SAP Host Agent is an agent that can accomplish several life-cycle management tasks, such as operating system monitoring, database monitoring, system instance control and provisioning. When you install a new SAP system or instance, the SAP Host Agent is in most cases installed automatically on the SAP system or instance host.
It is only required to install the SAP Host Agent separately if one of the following is true:

- 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. During the installation of new SAP instances with SAP kernel 7.20 or higher, the SAP Host Agent is installed automatically (integrated installation).
- You have upgraded your SAP system to a release with a kernel release lower than SAP kernel 7.20 and the host of the upgraded system or instance does not yet have an SAP Host Agent.

The section Installing the SAP Host Agent Separately [page 177] describes how to perform the installation.
3 Planning

3.1 Planning Checklist

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

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

Detailed information about the steps 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 11].
2. You have decided on your installation option (see Installation Options Covered by this Guide [page 22]).

Standard, Distributed, or High-Availability System

Note

In a standard system [page 22], all mandatory instances except the database instance are normally installed on one host. Therefore, if you are installing a standard system, you can ignore references to other hosts.

The SAP HANA database is normally pre-installed by SAP partners before you start the installation. For more information about how to install the SAP HANA database, see the SAP HANA Server Installation and Upgrade Guide at https://help.sap.com/hana_platform Installation and Upgrade. The database instance is remotely installed by Software Provisioning Manager (the “installer”) from the primary application server host.

However, if you are installing a standard system [page 22] on Linux, you can install SAP systems based on SAP NetWeaver 7.4 or higher on the same host as the SAP HANA database, without applying additional environment settings. For more information, see SAP Note 1953429.

1. Make yourself familiar with the changed file system structure and profiles for SAP systems based on SAP NetWeaver 7.1 and higher compared to SAP systems based on lower SAP NetWeaver releases. For more information, see Changed File System Structure and Profiles for SAP Systems Based on SAP NetWeaver 7.1 and Higher [page 35].
2. If you want to install an SAP ABAP system along with the required Support Package stack and ABAP Add-Ons in one implementation run, you need to plan the desired installation target using the maintenance planner at https://apps.support.sap.com/sap/support/mp.
In the maintenance planner, a stack XML file with the desired Support Package stack and Add-On information is generated, which you then hand over to Software Provisioning Manager (the “installer” for short) by calling it with 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). For more information, see Installation Using a Stack Configuration File (Optional) [page 36].

**Recommendation**

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

3. You check the hardware and software requirements [page 38] 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 decide on the transport host to use [page 67].
7. You decide whether you want to integrate LDAP Directory Services in your SAP system [page 163].
8. To install a high-availability system, you read Planning the Switchover Cluster for High Availability [page 68].
9. Optionally, you decide whether you want to install multiple components in one database (MCOD) [page 168].
10. Continue with Preparation [page 71].

**Additional Application Server Instance**

1. You check the hardware and software requirements [page 38] for every installation host on which you want to install one or more additional application server instances.
2. You identify Basic SAP System Installation Parameters [page 51].
3. Continue with Preparation [page 71].

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

**File system structure**

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

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

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

Profiles

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

  For more information, see the SCN blog What’s new in SAP NetWeaver 7.3 - A Basis perspective at: https://blogs.sap.com/2012/05/22/whats-new-in-sap-netweaver-73-a-basis-perspective/.

Caution

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

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

3.3 Installation Using a Stack Configuration File

The option to perform an installation using a stack configuration file (also called “up-to-date installation”) 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:

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

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

We recommend to perform the installation using a stack configuration file for new products, such as SAP S/4HANA or SAP Solution Manager 7.2.

**Prerequisites**

- To be able to use the Maintenance Planner at [https://apps.support.sap.com/sap/support/mp](https://apps.support.sap.com/sap/support/mp), your SAP Solution Manager system must have at least one of the following release and Support Package (SP) level:
  - SAP Solution Manager 7.2
  - SAP Solution Manager 7.1 SP06 or higher
  - SAP Solution Manager 7.0 SP 23 and you must have applied the following SAP Notes: [1646604](https://apps.support.sap.com/sap/support/notes/1646604), [1783371](https://apps.support.sap.com/sap/support/notes/1783371), [1743695](https://apps.support.sap.com/sap/support/notes/1743695)
- You must have implemented SAP Note [1940845](https://apps.support.sap.com/sap/support/notes/1940845) in your SAP Solution Manager system.
- For additional information about involved tools and supported SAP system releases, see SAP Note [2277574](https://apps.support.sap.com/sap/support/notes/2277574) for additional information about involved tools and supported SAP system releases.

**Features**

An installation using a stack configuration file provides the following features:

- You can use a stack configuration file generated by the Maintenance Planner at [https://apps.support.sap.com/sap/support/mp](https://apps.support.sap.com/sap/support/mp). The parameters contained in the stack configuration file can then be processed by the installer to get better integrated with SUM and to simplify the process of installation for a new system on a target software level. 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://wiki.scn.sap.com/wiki/display/SL/Landscape+Management++the+Process](https://wiki.scn.sap.com/wiki/display/SL/Landscape+Management++the+Process).
- When processing a stack configuration file, the installer can take over more default settings that are already predefined in the Maintenance Planner and offers more possibilities for automation as compared to when running without it. For more information about the benefits by comparing the existing process with the new improved process, see Up-To-Date Installation at [https://blogs.sap.com/2016/10/21/up-to-date-installation-2/](https://blogs.sap.com/2016/10/21/up-to-date-installation-2/).

**Integration**

For the additional input parameters that you need to specify, see Additional Parameters When Using a Stack Configuration File (Optional). You can find the link to this section in Related Information below.
In addition, each section in this guide describing steps that are completely or at least partially automatized when using a stack configuration files is marked with an appropriate note at the beginning. These are the following sections as listed in the adjacent section Related Information:

**Related Information**

Additional Parameters When Using a Stack Configuration File (Optional) [page 64]
Preparing the Installation Media [page 91]
Running the Installer [page 114]
Configuring the Change and Transport System [page 139]
Applying the Latest Kernel and Support Package Stacks [page 142]
Installing Additional Languages and Performing Language Transport [page 147]

### 3.4 Hardware and Software Requirements

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

**Prerequisites**

- 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 39].
     - Integrated in the installation tool (mandatory) as part of the installation process
       For more information, see Running the Installer [page 114].
   - The hardware and software requirements tables in Requirements for the SAP System Hosts [page 40].
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 contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing depending on:
  - The set of applications to be deployed
  - How intensively the applications are to be used
  - The number of users

### 3.4.1 Running the Prerequisites Check in Standalone Mode (Optional)

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

**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.
2. Make either the separate SAPEXE<Version>.SAR archive or the complete kernel medium available as described in Preparing the Installation Media.
3. Start the installer as described in Running the Installer.
4. On the Welcome screen, choose <SAP_Product> <Database> Preparations Prerequisites Check.
5. Follow the instructions in the installer dialogs and enter the required parameters.
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 93]
- Preparing the Installation Media [page 91]

### 3.4.2 Requirements for the SAP System Hosts

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

**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 41]
- Hardware Requirements [page 41]
- Software Requirements [page 46]
- Other Requirements [page 49]
3.4.2.1 General Installation Information for Your Operating System

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

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIX</td>
<td>Before you start the installation, make sure that you have read SAP Note 1972803. In addition, we also recommend that you check the information available in the SAP on AIX space on the SAP Community Network at <a href="https://www.sap.com/community/topic/aix.html">https://www.sap.com/community/topic/aix.html</a>.</td>
</tr>
<tr>
<td>HP-UX</td>
<td>Before you start the installation, make sure that you have read SAP Note 1075118. In addition, we also recommend that you check the information available in the SAP on HP-UX Best Practices space on the SAP Community Network at <a href="https://www.sap.com/community/topic/hp-ux.html">https://www.sap.com/community/topic/hp-ux.html</a>.</td>
</tr>
<tr>
<td>Linux</td>
<td>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 <a href="https://www.sap.com/community/topic/linux.html">https://www.sap.com/community/topic/linux.html</a>.</td>
</tr>
<tr>
<td>Solaris</td>
<td>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 <a href="https://www.sap.com/community/topic/oracle-solaris.html">https://www.sap.com/community/topic/oracle-solaris.html</a>.</td>
</tr>
</tbody>
</table>

3.4.2.2 Hardware Requirements

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

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware requirements</td>
<td>Your hardware must be 64-bit capable.</td>
</tr>
<tr>
<td>Requirement</td>
<td>Values and Activities</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Processing units     | **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.  
  **For an ASCS instance running on a separate host**: One physical or virtual processing unit usable by the operating system image might be sufficient.  
  Examples of processing units are processor cores or hardware threads (multithreading).  
  In a virtualized environment, ensure that adequate processor resources are available to support the workloads of the running SAP systems. |
| Optical media drive  | ISO 9660 compatible                                                                                                                                     |
### Requirement

<table>
<thead>
<tr>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard disk space</strong></td>
</tr>
</tbody>
</table>

- **General Requirements:**
  - 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 91].
  - 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 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 97].
  - 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:**
  If you install several instances on one host, you have to add up the requirements accordingly.

  **Note**
  
  If you are installing a standard system on Linux, you can install SAP systems based on SAP NetWeaver Application Server for ABAP 7.4 or higher on the same host as the SAP HANA database. In this case, you must make sure that you include the disk space requirements for the SAP HANA database instance. For more information, see SAP Note 1953429.

  For more information about space requirements for the file systems and directories of the instances, see SAP Directories [page 79] and the appropriate database-specific information listed below.

  - ABAP central services instance (ASCS):
    - Minimum 2 GB
    - If you install the ASCS instance with an integrated 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.
    - If you install the ASCS instance with an integrated SAP Gateway, you require at least 1 GB of hard disk space in addition.
  - Enqueue replication server instance for the ASCS (if required):
    - Minimum 2 GB
  - Primary application server instance:
    - Minimum 2 GB (SAP NetWeaver BW server: Minimum 30 GB)
    - Plus 1 GB for the SAP HANA database client software
  - Additional application server instance:
    - Minimum 2 GB (SAP NetWeaver BW server: Minimum 30 GB)
    - Plus 1 GB for the SAP HANA database client software
  - SAP Host Agent:
    - Minimum 0.5 GB
### Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 to 7.5x on UNIX: SAP HANA Database

#### Planning

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM</td>
<td>Only valid for 'Platform': AIX</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td><strong>AIX</strong>: Keep in mind that the operating system itself requires about 10% of the available RAM.</td>
</tr>
<tr>
<td></td>
<td>End of 'Platform': AIX</td>
</tr>
</tbody>
</table>

The following lists the RAM requirements for each SAP instance.

If you install **several instances on one host**, you have to add up the requirements accordingly.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABAP central services instance (ASCS instance)</td>
<td>Minimum 1 GB</td>
</tr>
<tr>
<td>If you install the ASCS instance with an integrated SAP Web Dispatcher, see SAP Note 2007212 for memory consumption in productive use.</td>
<td></td>
</tr>
<tr>
<td>Enqueue replication server instance for the ASCS instance (if required)</td>
<td>Minimum 1 GB</td>
</tr>
<tr>
<td>Primary application server instance:</td>
<td>Minimum 3 GB (BW server: Minimum 2 GB)</td>
</tr>
<tr>
<td>Additional application server instance:</td>
<td>Minimum 3 GB</td>
</tr>
<tr>
<td>SAP Host Agent:</td>
<td>Minimum 1 GB</td>
</tr>
</tbody>
</table>

Only valid for 'Platform': HP-UX

| HP-UX: Refer to SAP Note 1112627 for the commands to display the RAM size on HP-UX. |

End of 'Platform': HP-UX

Only valid for 'Platform': Linux

| Linux: Refer to SAP Note 1382721 for the commands to display the RAM size on Linux. |

End of 'Platform': Linux
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| **AIX: Paging space** | You need hard disk drives with sufficient paging space. You can calculate the required paging space as follows:  
  - Optimistic strategy:  
    You need at least 20 GB for the primary application server instance and at least another 10 GB for every additional application server instance.  
  - Defensive strategy:  
    3 * RAM, at least 20 GB  
  In addition, for the database instance you need:  
    - 0.75 * RAM, if RAM is greater than 8 GB  
    - 1 * RAM, if RAM is less than 8 GB  
  For the latest information about recommended paging space, see SAP Note 1121904. |
| **HP-UX: Swap space** | You need hard disk drives with sufficient space for swap. You can calculate the required swap space as follows:  
  2 * RAM, at least 20 GB  
  **SAP NetWeaver Process Integration 7.5 or higher:** 2 * RAM or 80 GB, whichever is higher  
  For more information about HP-UX swap space recommendations and about how to set up swap space, see SAP Note 1112627. |
| **Linux: Swap space** | 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. |
| **Oracle Solaris: Swap space** | You need hard disk drives with sufficient space for swap.  
  At least 20 GB are required. For more information, see SAP Note 570375. |
| **Verifying paging space size and kernel settings using memlimits** | To verify paging space size and kernel settings, you can execute `memlimits` as follows:  
  1. Make sure that the SAPCAR program is available on the installation host. If SAPCAR is not available, you can download it from [https://launchpad.support.sap.com/#/software-center](https://launchpad.support.sap.com/#/software-center).  
  2. Make the SAPEXE.SAR archive available on the installation host. Either download it as described in [Downloading SAP Kernel Archives (Archive-Based Installation)](page 97) or take it from the kernel media, where this archive is contained in the folder `K_<Kernel_Version>_<U/N>_<OS>/DBINDEP`.  
  3. To unpack the file `memlimits`, enter the following command:  
     `SAPCAR -xvfg SAPEXE.SAR memlimits`  
  4. Start `memlimits` using the following command:  
     `. /memlimits -l 20000`  
  In case of error messages, increase the paging space and rerun `memlimits` until there are no more errors. |
3.4.2.3 Software Requirements

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

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AIX: Operating system version</strong></td>
<td>Your operating system platform must be 64-bit.</td>
</tr>
<tr>
<td></td>
<td>Check the Product Availability Matrix (PAM) at <a href="http://support.sap.com/pam">http://support.sap.com/pam</a> for supported operating system versions.</td>
</tr>
<tr>
<td></td>
<td>Contact your OS vendor for the latest OS patches.</td>
</tr>
<tr>
<td></td>
<td>Minimal OS requirements for the specific SAP Kernel releases are listed in SAP Note <a href="http://support.sap.com/pam">1780629</a>.</td>
</tr>
<tr>
<td></td>
<td>You require at least AIX 6.1 TL7 SP10 to be able to run the installer.</td>
</tr>
<tr>
<td><strong>HP-UX: Operating system version</strong></td>
<td>Your operating system platform must be 64-bit.</td>
</tr>
<tr>
<td></td>
<td>Check the Product Availability Matrix (PAM) at <a href="http://support.sap.com/pam">http://support.sap.com/pam</a> for supported operating system versions.</td>
</tr>
<tr>
<td></td>
<td>To check the operating system version on your installation hosts, use the following command:</td>
</tr>
<tr>
<td></td>
<td><code>uname -r</code></td>
</tr>
<tr>
<td></td>
<td>See SAP Note <a href="http://support.sap.com/pam">939891</a> for information about support time frames of HP-UX.</td>
</tr>
<tr>
<td><strong>Linux: Operating system version</strong></td>
<td>Your operating system platform must be 64-bit.</td>
</tr>
<tr>
<td></td>
<td>Check the Product Availability Matrix (PAM) at <a href="http://support.sap.com/pam">http://support.sap.com/pam</a> for supported operating system versions.</td>
</tr>
<tr>
<td></td>
<td>Contact your OS vendor for the latest OS patches.</td>
</tr>
<tr>
<td></td>
<td>To check the operating system version on your installation hosts, use the following command:</td>
</tr>
<tr>
<td></td>
<td><code>cat /etc/*-release</code></td>
</tr>
<tr>
<td><strong>Oracle Solaris: Operating system version</strong></td>
<td>Your operating system platform must be 64-bit.</td>
</tr>
<tr>
<td></td>
<td>Check the Product Availability Matrix (PAM) at <a href="http://support.sap.com/pam">http://support.sap.com/pam</a> for supported operating system versions.</td>
</tr>
<tr>
<td></td>
<td>To check the operating system version on your installation hosts, use the following command:</td>
</tr>
<tr>
<td></td>
<td><code>/bin/uname -r</code></td>
</tr>
</tbody>
</table>
### Requirement | Values and Activities
--- | ---
SAP Kernel Releases and Versions | For more information about release and roadmap information for the kernel versions and how this relates to SAP NetWeaver support packages, including important notes on downward compatibility and release dates, see the document *Understanding Kernel Releases for the SAP NetWeaver AS ABAP* at [https://archive.sap.com/documents/docs/DOC-54170](https://archive.sap.com/documents/docs/DOC-54170).

To use regular Software Provisioning Manager (SWPM<Version>.SAR) with SAP kernel 7.49 or higher on RHEL 6 or SLES 11 or Oracle Linux 6, you must install the required `libstdc++` RPM packages. For more information, see SAP Note [2195019](https://support.sap.com/notes/2195019).

AIX: Kernel parameters | To adjust AIX Virtual Memory Management settings, see SAP Note [973227](https://support.sap.com/notes/973227).

HP-UX: Kernel parameters | To run an SAP system, make sure that you check and, if necessary, modify the HP-UX kernel.

**Caution**

We recommend that a UNIX system administrator performs all kernel modifications.

Proceed as follows:

1. Check SAP Note [172747](https://support.sap.com/notes/172747) for recommendations on current HP-UX kernel parameters.

   **Caution**

   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.

   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.

2. If necessary, modify the kernel parameters in one of the following ways:
   - Manually, as described in SAP Note [172747](https://support.sap.com/notes/172747).
   - Interactively, using the HP-UX System Administrator Manager (SAM) or System Management Homepage (SMH).

Linux: Kernel parameters | Check SAP Note [2369910](https://support.sap.com/notes/2369910) for Linux kernel versions certified by SAP.

To check the Linux kernel parameters for your Linux distribution, see one of the following SAP Notes:

- RHEL6: SAP Note [1496410](https://support.sap.com/notes/1496410)
- RHEL7: SAP Note [2002167](https://support.sap.com/notes/2002167)
- SLES 11: SAP Note [1310037](https://support.sap.com/notes/1310037)
- SLES 12: SAP Note [1984787](https://support.sap.com/notes/1984787)
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| **Oracle Solaris: Kernel parameters** | To run an SAP system, you must check and, if necessary, modify the Oracle Solaris kernel parameters or resource controls.  
  - Oracle Solaris 10: SAP Note 724713  
  - Oracle Solaris 11: SAP Note 1797712 |
| **HP-UX: OS patches**           | To check the minimum required OS patches, see SAP Note 837670.                                                                                       |
| **Oracle Solaris: OS patches**  | Check the relevant SAP Note for required Oracle Solaris patches:  
  - Sun Solaris 10 on SPARC: SAP Note 832871  
  - Oracle Solaris 11: SAP Note 1797712 |
| **AIX: National Language Support (NLS)** | Make sure that National Language Support (NLS) and corresponding locales are installed.                                                               |
| **HP-UX: National Language Support (NLS)** | Make sure that National Language Support (NLS) and corresponding locales are installed.  
  You can check this as follows:  
  - Enter the following commands to check whether National Language Support (NLS) is installed:  
    `swlist -v | grep -i nls`  
    The output should contain the string `NLS-AUX ...`  
  - Enter the following commands to check which locales are available:  
    `locale -a`  
    The following files must be available: `de_DE.iso88591`, `en_US.iso88591`. |
| **Linux: National Language Support (NLS)** | Make sure that National Language Support (NLS) and corresponding locales are installed.  
  You can check this as follows:  
  - Ensure that the required locales such as the following are available:  
    `de_DE`, `en_US`  
  - Check SAP Note 187864 for information about corrected operating system locales and SAP blended Code Pages. |
| **Oracle Solaris: National Language Support (NLS)** | Make sure that National Language Support (NLS) and corresponding locales are installed.  
  Enter the following command to check which locales are available:  
  `locale -a`  
  The following locale must be available: `en_US.ISO8859-1` |
| **System language**             | For the installation, you must choose English as the operating system language on all hosts that run SAP software.                             |
### SAP Kernel 7.40 and Higher: IP Multicast Configuration

Make sure that you have applied the operating system patches required for IP Multicast Configuration. For more information, see SAP Note 1931675.

### 3.4.2.4 Other Requirements

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

#### Other Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Web Browser</td>
<td>Make sure that you have at least one of the following web browsers installed on the host where you run the installer GUI:</td>
</tr>
<tr>
<td></td>
<td>● Microsoft Internet Explorer 11 or higher</td>
</tr>
<tr>
<td></td>
<td>● Microsoft Edge</td>
</tr>
<tr>
<td></td>
<td>● Mozilla Firefox</td>
</tr>
<tr>
<td></td>
<td>● Google Chrome</td>
</tr>
<tr>
<td></td>
<td>Always use the latest version of these web browsers.</td>
</tr>
<tr>
<td></td>
<td>You need a web browser to be able to run the SL Common GUI, and to display the Evaluation Form and send it to SAP.</td>
</tr>
<tr>
<td>AIX: Additional software</td>
<td>Make sure that the following additional file sets are installed:</td>
</tr>
<tr>
<td></td>
<td>● bos.adt - Base Application Development</td>
</tr>
<tr>
<td></td>
<td>● bos.perf - performance and diagnostics tools</td>
</tr>
<tr>
<td></td>
<td>● perfagent.tools - performance monitoring tools</td>
</tr>
<tr>
<td></td>
<td>● bos.perf.libperfstat - Performance Statistics Library</td>
</tr>
<tr>
<td>Host name</td>
<td>To find out physical host names, open a command prompt and enter <code>hostname</code>.</td>
</tr>
<tr>
<td></td>
<td>For more information about the allowed host name length and characters allowed for SAP system instance hosts, see SAP Note 611361.</td>
</tr>
<tr>
<td></td>
<td>Only valid for 'Platform': HP-UX</td>
</tr>
<tr>
<td></td>
<td>For HP-UX, see SAP Note 1503149 in addition.</td>
</tr>
<tr>
<td></td>
<td>End of 'Platform': HP-UX</td>
</tr>
<tr>
<td></td>
<td>If you want to use virtual host names, see SAP Note 962955.</td>
</tr>
</tbody>
</table>
### Planning User and Access Management

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

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

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

#### 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 110].
For more information about configuring the user management of your SAP system to be installed, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quicklink</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>● SAP NetWeaver 7.3 including Enhancement Package 1 <a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
<td>Configuration of User and Role Administration ▶ Directory Services ▶ LDAP Connector</td>
</tr>
<tr>
<td>● SAP NetWeaver 7.4 <a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.5 <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver AS for ABAP 7.52 <a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

### 3.6 Basic Installation Parameters

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

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

- **Typical**
  - If you choose Typical, the installation is performed with default settings. This means that the installer prompts you only for a small selection of installation parameters. These parameters include at least the following:
    - SAP system ID and database connectivity parameters
    - Master password
    - SAP system profile directory – only for systems with instances on separate hosts
    - **SAP systems based on SAP NetWeaver 7.40 and higher:** Individual encryption key for the secure storage
  - For more information about the installation parameters, see the corresponding tables below in this document. If you want to change any of the default settings, you can do so on the Parameter Summary screen.

- **Custom**
  - If you choose Custom, you are prompted for all parameters. At the end, you can still change any of these parameters on the Parameter Summary screen.
You cannot change from Custom to Typical mode or from Typical to Custom mode on the Parameter Summary screen.

- If you want to install an ASCS instance with an integrated SAP Web Dispatcher [page 29], you must choose Custom. Otherwise, you are not prompted for the SAP Web Dispatcher installation parameters [page 66] during the Define Parameters phase of the ASCS instance installation.
- If you want to install an ASCS instance with an integrated Gateway [page 31], you must choose Custom. Otherwise, you are not prompted for the SAP Gateway installation during the Define Parameters phase of the ASCS instance installation.

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 installer screens.

### Related Information

- SAP System Parameters [page 53]
- 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 Configuration File (Optional) [page 64]
- Parameters for Additional Components to be Included in the ASCS Instance (Optional) [page 66]
### 3.6.1 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 installer screens.

#### General Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unicode System</td>
<td>Every <em>new</em> installation of an SAP system is Unicode.</td>
</tr>
<tr>
<td></td>
<td><strong>SAP systems based on SAP NetWeaver 7.1 to 7.4:</strong></td>
</tr>
<tr>
<td></td>
<td>You can only deselect this option if you perform the target system installation in the context of a system copy for a non-Unicode SAP system that has been upgraded to the current release.</td>
</tr>
<tr>
<td></td>
<td><strong>SAP systems based on SAP NetWeaver 7.5 or higher</strong> are Unicode only.</td>
</tr>
<tr>
<td></td>
<td>If you install an additional application server instance in an existing non-Unicode system (that has been upgraded to the current release), the additional application server instance is installed automatically as a non-Unicode instance. The installer checks whether a non-Unicode system exists and chooses the right executables for the system type.</td>
</tr>
<tr>
<td>SAP System ID <code>&lt;SAPSID&gt;</code></td>
<td>The SAP system ID <code>&lt;SAPSID&gt;</code> identifies the entire SAP system.</td>
</tr>
<tr>
<td></td>
<td>The installer prompts you for the <code>&lt;SAPSID&gt;</code> when you execute the <em>first</em> installation option to install a new SAP system.</td>
</tr>
<tr>
<td></td>
<td>If there are further installation options to be executed, the installer prompts you for the <code>profile directory</code>. For more information, see the description of the parameter <code>SAP System Profile Directory</code>.</td>
</tr>
</tbody>
</table>

**Example**

This prompt appears when you install the ASCS instance, which is the first instance to be installed in a distributed system.

**Caution**

Choose your SAP system ID carefully since renaming requires considerable effort.

Make sure that your SAP system ID:

- Is unique throughout your organization. Do not use an existing `<SAPSID>` when installing a new SAP system.
- Consists of exactly three alphanumeric characters
- Contains only uppercase letters
- Has a letter for the first character
- Does not include any of the reserved IDs listed in SAP Note 1979280.
- If you want to install an additional application server instance, make sure that no Gateway instance with the same SAP System ID (SAPSID) exists in your SAP system landscape.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| SAP System Instance Numbers | Technical identifier for internal processes. It consists of a two-digit number from 00 to 97. The instance number must be unique on a host. That is, if more than one SAP instance is running on the same host, these instances must be assigned different numbers.

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.

To find out instance numbers of SAP systems that already exist on the installation host, look for subdirectories ending with `<Instance_Number>` of local (not mounted) `/usr/sap/<SAPSID>` directories.

For more information about the naming of SAP system instances, see SAP Directories [page 79]. |

**Caution**

AIX only: If you are using NIM Service Handler (NIMSH), do not use 01 or 02 for the instance number. The installer uses the instance number for the internal message server port 39<Instance_Number>. The NIM client daemon uses reserved ports 3901 and 3902.

**Caution**

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 299727.
- 02 as the instance number because this number is used to determine the port number for report RSLGCOLL, which is 14<Instance_Number> by default. However, port 1402 is already used by the OS process `rstlisten`. If you still decide to use 02 as the instance number, the instance fails to start during the installation process. You then have to manually change the port number for report RSLGCOLL to continue with the installation. For more information, see Running the Installer [page 114].

End of 'Platform': HP-UX
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| Virtual Host Name | Virtual host name (network name) of the SAP<SID> cluster group. You can assign a virtual host name to an SAP instance in one of the following ways:  
- You can provide a virtual host name in the <Instance_Name> Virtual Host field on the installer screen of the relevant instance. Then this instance is installed with the given virtual host name.  
- Alternatively you can assign virtual host names also by starting the installer with the SAPINST_USE_HOSTNAME property. For more information, see Running the Installer [page 114].  
After the installation has completed, all application servers can use this virtual host name to connect to the instance. The virtual host name is also a global host name. If you do not provide the virtual host name, the instance is installed automatically using its physical host name.  
You must have already reserved the virtual host name (network name) and its IP address on a DNS server before you run the installer. For more information, see Using Virtual Host Names [page 89]. |
| Note | Fully qualified host names, IPv4, IPv6 are not accepted as virtual host names. |
| SAP Process Integration (PI) 7.5, SAP Solution Manager 7.2: Application Server Gateway Communication Setup | If you want to install the primary application server instance of the Java system on a host different from the host of the primary application server instance of the ABAP system, then you must specify the host of the Java primary application server instance during the Define Parameters phase of the primary application server instance installation of the ABAP system.  
This is to set up the connection between the ABAP and the Java system. |
| SAP System Profile Directory | `<sapmnt>/<SID>/profile` or `/usr/sap/<SID>/SYS/profile`  
The installer retrieves parameters from the SAP system profile directory of an existing SAP system.  
SAP profiles are operating system files that contain instance configuration information.  
The installer prompts you to enter the location of the profile directory when the installation option that you execute is not the first one belonging to your SAP system installation, 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 SAP System ID and Database ID.  
`/usr/sap/<SID>/SYS/profile` is the soft link referring to `/sapmnt/<SID>/profile`. |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Password</td>
<td>Common password for all users that are created during the installation:&lt;br&gt;● Operating system users (for example <code>&lt;sapsid&gt;adm</code>)</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong>&lt;br&gt;If you did not create the operating system users manually before the installation, the installer creates them with the common master password (see Operating System Users). In this case, make sure that the master password meets the requirements of your operating system.</td>
</tr>
<tr>
<td></td>
<td>● ABAP users: <code>SAP*</code>, <code>DDIC</code>, and <code>EARLYWATCH</code>.&lt;br&gt;● Secure Store key phrase&lt;br&gt;SAP systems based on SAP NetWeaver 7.4 and Higher: For more information, see line Key Phrase for Secure Store Settings and line Individual Encryption Key for the Secure Storage in this table.</td>
</tr>
<tr>
<td></td>
<td><strong>Basic Password policy</strong>&lt;br&gt;The master password must meet the following requirements:&lt;br&gt;● It must be 8 to 14 characters long&lt;br&gt;● It must contain at least one letter (a-z, A-Z)&lt;br&gt;● It must contain at least one digit (0-9)&lt;br&gt;● It must not contain <code>\</code> (backslash) or <code>&quot;</code> (double quote).</td>
</tr>
<tr>
<td></td>
<td><strong>Additional restrictions depending on SAP HANA database:</strong>&lt;br&gt;● It must consist of at least one number, one lowercase letter, and one uppercase letter.&lt;br&gt;● It can only contain the following characters: <code>_</code>, <code>a</code>, <code>A</code>, <code>Z</code>, <code>0-9</code>, <code>!</code>, <code>\</code>, <code>#</code>, <code>&amp;</code>, <code>$</code>, <code>!</code> and must not start with a number or an underscore (<code>_</code>).</td>
</tr>
<tr>
<td></td>
<td>Depending on the installation option, additional restrictions may apply.</td>
</tr>
<tr>
<td>Message Server Access Control List</td>
<td>You can specify if you want to have a message server Access Control List (ACL) created.&lt;br&gt;The ACL is created as a file in the <code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/global</code> directory. If it exists, it defines the hosts from which the message server accepts requests.&lt;br&gt;<strong>Caution</strong>&lt;br&gt;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.</td>
</tr>
<tr>
<td></td>
<td>For more information, see the information about ms/acl_info in SAP Notes 1495075 and 826779.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>SAP systems based on SAP NetWeaver 7.4 and Higher only: Individual Encryption Key for the Secure Storage</td>
<td>You can set a randomly generated individual encryption key for the secure storage in the file system and the secure storage in the database. If you skip this step, the system is installed with a default key which provides obfuscation only, but it can be changed later.</td>
</tr>
<tr>
<td>DNS Domain Name for SAP System</td>
<td>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. The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter SAPLOCALHOSTFULL. FQDN is the fully qualified domain name for an IP address. It consists of the host name and the domain name: &lt;Host_Name&gt;.&lt;Domain_Name&gt; The DNS Domain Name is needed to define the URLs for the ABAP application servers. It is appended to the server name to calculate the FQDN.</td>
</tr>
<tr>
<td></td>
<td>▶ Example</td>
</tr>
<tr>
<td></td>
<td>If your application server host is called kirk.wdf.sap.com, the DNS Domain Name is wdf.sap.com.</td>
</tr>
<tr>
<td>SAP Host Agent Upgrade (Optional)</td>
<td>If there already exists an SAP Host Agent on the installation host, the installer 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 SAPHOSTAGENT&lt;Version&gt;.SAR archive. For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 97]</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| ABAP Message Server Port  | **Caution**  
> 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.  
> If you do not specify a value, the default port number is used.  
> **ABAP Message Server Port**  
> There is an external message server port and an internal message server port.  
> The ABAP message server uses both the internal and the external message server ports.  
> The default profile contains the configuration for both message server ports.  
> The external message server port uses the parameter rdisp/msserv with default value 36<ABAP_Message_Server_Instance_Number>.  
> The internal message server port uses the parameter rdisp/msserv_internal with default value 39<ABAP_Message_Server_Instance_Number>.  
> During the installation of an SAP system from scratch or an additional application server instance to an existing SAP system, the message server is configured to only accept secure connections. The DEFAULT.PFL profile parameter system/secure_communication is set to ON (system/secure_communication = ON) if the kernel supports secure connections to the message server. For more information, see SAP Note 2040644. |
### Operating System Users

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System Users and Groups</td>
<td>The installer processes the operating system users as follows:</td>
</tr>
<tr>
<td></td>
<td>• If the operating system users do not exist, the installer creates the following users:</td>
</tr>
<tr>
<td></td>
<td>○ The SAP system administrator user <code>&lt;sapsid&gt;adm</code></td>
</tr>
<tr>
<td></td>
<td>○ Database administrator users</td>
</tr>
<tr>
<td></td>
<td>The installer sets the master password for these users by default. You can overwrite and change the passwords either by using the parameter mode Custom or by changing them on the parameter summary screen.</td>
</tr>
<tr>
<td></td>
<td>• If the operating system users already exist, the installer prompts you for the existing password, except if the password of these users is the same as the master password.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>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 installer has completed.</td>
</tr>
<tr>
<td></td>
<td>During the <code>Define Parameters</code> phase of the installer, you can specify that the operating system users are to be removed automatically from the group <code>sapinst</code> after the execution of the installer has completed.</td>
</tr>
<tr>
<td></td>
<td>For more information about the group <code>sapinst</code>, see Creating Operating System Users and Groups [page 74].</td>
</tr>
<tr>
<td></td>
<td>For more information about the <code>sapinst_instdir</code> directory, see Useful Information About the Installer [page 120].</td>
</tr>
</tbody>
</table>

### User Management Engine Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java Administrator User</td>
<td>The installer creates this user in the ABAP system.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>This user is only created during the installation of the application server ABAP for an SAP NetWeaver 7.5 Process Integration (PI) system or for an SAP Solution Manager 7.2 system.</td>
</tr>
<tr>
<td></td>
<td>After the installation, this user is available both in the ABAP and in the Java system.</td>
</tr>
<tr>
<td></td>
<td>The installer sets the user name <code>J2EE_ADMIN</code> and the master password by default.</td>
</tr>
<tr>
<td></td>
<td>If required, you can choose another user name and password according to your requirements.</td>
</tr>
</tbody>
</table>
### Java Guest User

**Note**
This user is only created during the installation of the application server ABAP for an SAP NetWeaver 7.5 Process Integration (PI) system or for an SAP Solution Manager 7.2 system.

This user is for employees who do not belong to a company or who have registered as company users and who are waiting for approval. Guest users belong to the default group **Authenticated Users**.

The installer creates this user in the ABAP system.

After the installation, it is available both in the ABAP and in the Java system.

The installer sets the user name `J2EE_GUEST` and the master password by default.

If required, you can choose another user name and password according to your requirements.

For more information about supported UME data sources and change options, see SAP Note [718383](#).

### Communication User

**Note**
This user is only created during the installation of the application server ABAP for an SAP NetWeaver 7.5 Process Integration (PI) system or for an SAP Solution Manager 7.2 system.

The installer creates this user in the ABAP system.

After the installation, it is available both in the ABAP and in the Java system.

This user is used for the communication between the ABAP system and the Java system.

The installer sets the user name `SAPJSF` and the master password by default.

If required, you can choose another user name and password according to your requirements.

For more information about supported UME data sources and change options, see SAP Note [718383](#).
System Landscape Directory

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLD Destination for the System</td>
<td>The System Landscape Directory (SLD) registers the systems and the installed software of your entire system landscape.</td>
</tr>
<tr>
<td></td>
<td>You can choose between the following options:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Register in existing SLD</strong></td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>• <strong>No SLD destination</strong></td>
</tr>
<tr>
<td></td>
<td>Choose this option if you do <strong>not</strong> want to register the SAP system you are installing in an existing SAP System Landscape Directory (SLD).</td>
</tr>
<tr>
<td></td>
<td>You then have to configure the SLD destination manually after the installation has finished.</td>
</tr>
<tr>
<td></td>
<td>For more information, see <em>Performing Post-Installation Steps for the ABAP Application Server</em> [page 144]</td>
</tr>
<tr>
<td>SLD Host</td>
<td>The host name of the existing SLD.</td>
</tr>
<tr>
<td>SLD HTTP(S) Port</td>
<td>HTTP port of the SAP system based on AS Java on which the System Landscape Directory (SLD) resides. The following naming convention applies:</td>
</tr>
<tr>
<td></td>
<td>5&lt;Primary_Application_Server_Instance_Number&gt;00.</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>SLD Data Supplier User and</td>
<td>The existing SLD Data Supplier user and password of the existing SLD.</td>
</tr>
<tr>
<td>password</td>
<td></td>
</tr>
</tbody>
</table>
### 3.6.2 SAP System Database Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSTEM_ID</td>
<td>The SYSTEM_ID identifies the database instance.</td>
</tr>
<tr>
<td></td>
<td>This is the result of the following query:</td>
</tr>
<tr>
<td></td>
<td>[select SYSTEM_ID from M_DATABASE]</td>
</tr>
<tr>
<td></td>
<td>If your SAP HANA SYSTEM_ID is the same as the chosen SAP System ID &lt;SAPSID&gt;, there are following restrictions:</td>
</tr>
<tr>
<td></td>
<td>- The ABAP system and SAP HANA database have to be installed on different hosts</td>
</tr>
<tr>
<td></td>
<td>- Database installation has to done on the ABAP host. Otherwise Database installation procedure with Software Provisioning Manager (the “installer”) could overwrite the environment files (sapenv.*) of the SAP HANA database and the database will not start any more after reboot.</td>
</tr>
<tr>
<td>DATABASE_NAME, Database ID, &lt;DBSID&gt;</td>
<td>The &lt;DBSID&gt; identifies the tenant database. This is the result of the following query:</td>
</tr>
<tr>
<td></td>
<td>[select DATABASE_NAME from M_DATABASE]</td>
</tr>
<tr>
<td></td>
<td>MCOD only: If you want to use an existing database system, enter exactly the database ID of the existing SAP HANA database.</td>
</tr>
<tr>
<td></td>
<td>For more information, see Installation of Multiple Components in One Database [page 168].</td>
</tr>
<tr>
<td>Database schema</td>
<td>The ABAP database schema is named SAP&lt;SCHEMA_ID&gt;. Default value: SAPABAP1. You can either accept this default or enter another value according to your needs.</td>
</tr>
</tbody>
</table>

**Recommendation**

Do not choose a value that contains the <SAPSID> of your system. Keep in mind that you cannot change the schema name retrospectively. Therefore, if you change the <SAPSID> by performing a system rename or a system copy, the schema name always remains the same as the original one you assigned during the installation.
### 3.6.3 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Port for ABAP</td>
<td>For a secure communication of connected SAP systems to the ABAP stack you have to define the HTTPS port that is to be configured in the application server instance profile. Further post-installation steps (<a href="#">page 146</a>) are required to fully enable HTTPS communication. For more information about HTTPS enablement, see SAP Notes <a href="#">1527879</a> and <a href="#">510007</a>. In addition you can configure an HTTP port. However, this is not recommended for productive SAP systems due to security reasons.</td>
</tr>
<tr>
<td>Application Server Gateway Communication Setup</td>
<td>If you want to install the primary application server instance of the <strong>Java</strong> system on a host <strong>different</strong> from the host of the primary application server instance of the ABAP system, then you must specify the host of the Java primary application server instance during the <strong>Define Parameters</strong> phase of the primary application server instance installation of the ABAP system. This is to set up the connection between the ABAP and the Java system.</td>
</tr>
</tbody>
</table>

**Recommendation**

If you are about to install an **SAP NetWeaver 7.5 Process Integration** system and you intend to run automated configuration using the Central Technical Configuration (CTC) Wizard after the installation, it is strongly recommended that you configure the ABAP communication port for ABAP already during the installation process, because you can only run the CTC Wizard if the ABAP port is either completely configured for HTTPS or optionally for HTTP (see also **PI: Configuring the Process Integration System After the Install** [page 149]).
## 3.6.4 Additional Parameters When Using a Stack Configuration File (Optional)

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Domain</td>
<td>The ABAP Transport Management System (TMS) must be configured before ABAP correction packages can be applied. You can also run the configuration or even reconfigure the TMS after the installation has finished.</td>
</tr>
<tr>
<td></td>
<td>To be able to transport changes between the SAP systems in your system landscape, you need to configure the Transport Management System (TMS) for all SAP systems in your system landscape and configure one transport domain controller. To start the TMS in your ABAP system for later reconfiguration, call transaction STMS. At least one transport landscape with this system as transport domain controller is required before you can apply corrections, support packages, or upgrades to the SAP system.</td>
</tr>
<tr>
<td></td>
<td>The name of the Transport Domain must not contain blank characters. You cannot change the name afterwards without reconfiguring the transport domain controller and thereby the entire Transport Domain. By default use <code>DOMAIN_&lt;SAPSID&gt;</code> for the Transport Domain of a single transport landscape with this system as transport domain controller.</td>
</tr>
<tr>
<td>Directory with Transport Files</td>
<td>Location of the ABAP transport files that are to be included after the ABAP load during the installation. All transport files in this directory are imported with the transport control program (<code>tp</code>).</td>
</tr>
<tr>
<td>Location of SPAM/SAINT Update Archive</td>
<td>A SPAM/SAINT update contains updates and improvements to the Support Package Manager (SPAM) and the Add-On Installation Tool (SAINT). Provide the full path to the SPAM/SAINT update archive. SPAM/SAINT is delivered with the ABAP load. SAP recommends that you always use the latest version of SPAM/SAINT before applying Support Packages.</td>
</tr>
</tbody>
</table>
| Decide whether you want to prepare for the Software Update Manager run at the end of the installation | With the Software Update Manager 1.0 (SUM), you can apply support packages stacks at the end of the installation.  
- Do not start SUM automatically  
- Start SUM automatically at the end of the installation  
Choose to start SUM automatically, if you want to have the SUM STARTUP script called in the default `<Update Directory>/SUM/` directory at the end of the installation. |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extract the SUM*.SAR Archive</td>
<td>If you choose to extract the SUM*.SAR archive, the provided archive is extracted to the default update directory: UNIX and IBM: /usr/sap/&lt;SAPSID&gt;/.</td>
</tr>
<tr>
<td>SUM HTTP port</td>
<td>If you are running several SAP system updates on the same host, you have to use different port numbers for each update. You can adjust the default SUM HTTP port by entering the required port number in the SUM HTTP Port field. When doing so you set the SUM GUI Port number to (=&lt;HTTP port number+2&gt;). Dependencies See also the Software Update Manager documentation at: <a href="http://support.sap.com/sltoolset">http://support.sap.com/sltoolset</a></td>
</tr>
<tr>
<td>SUM Batch Input File</td>
<td>You can specify a batch file with some default values for the update. SUM then starts with parameter <code>batchfile=\&lt;XML file with input parameters&gt;</code>. Enter the full path to the existing batch file. Placeholders like <code>@PARAMETER_VALUE@</code> inside the file are replaced by values known from the installation.</td>
</tr>
<tr>
<td>Install Additional SAP System Languages</td>
<td>A set of default languages is delivered with the ABAP load. From the language media delivered with your product version or - if already provided by the Maintenance Planner for the respective product - using language archives, you can select additional languages that you want to have installed during SAP system installation. If you want to install additional languages, you must provide the directory with the additional language packages for the ABAP installation load, for example with subdirectories like <code>DATA_UNITS/ES</code>.</td>
</tr>
</tbody>
</table>

For more information, see [Installation Using a Stack Configuration File (Optional) [page 36]]

Related Information

[Installation Using a Stack Configuration File [page 36]]
3.6.5 Parameters for Additional Components to be Included in the ASCS Instance (Optional)

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

**Note**

You must choose *Custom* parameter mode. Otherwise you are not prompted for the parameters related to these additional components during the *Define Parameters* phase.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install a gateway integrated in the ASCS instance</td>
<td>When processing the screens for the ASCS instance installation, you are prompted to mark this checkbox on the screen <em>Additional Components to be Included in the ASCS Instance</em>.</td>
</tr>
</tbody>
</table>
| Install an SAP Web Dispatcher integrated in the ASCS instance | When processing the screens for the ASCS instance installation, you are prompted to mark this checkbox on the screen *Additional Components to be Included in the ASCS 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: |
| Message Server Host | The name of the host on which the message server is located (profile parameter `rdisp/mshost`) |
| Message Server HTTP Port | HTTP port of the message server (profile parameter `ms/server_port_<xx>`) |
| Password for the Internet Communication Management (ICM) user | In order to use the web administration interface for the Internet Communication Manager (ICM) and SAP Web Dispatcher, an administration user `webadm` is created by the installer.  
You have to assign a password for this user. |

Related Information

- ASCS Instance with Integrated SAP Web Dispatcher [page 29]
- ASCS Instance with Integrated Gateway [page 31]
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 installer creates during the installation of the SAP system by default on the global host.
  The installer by default creates the transport directory on the global host in `/usr/sap/trans`.

- Use a transport directory located on a host other than the default host:
  - You can use an existing transport directory and host in your SAP system landscape.
  - You can set up a new transport directory on a different host.
In either case, you must prepare this host for use by the new SAP system. For more information, see Exporting and Mounting the Global Transport Directory [page 108].

More Information

- Required File Systems and Directories [page 78]
- See the SAP Library at:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Library Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3</td>
<td>Application Help ➤ Function-Oriented View ➤ Solution Life Cycle Management ➤ Software Logistics ➤ Change and Transport System ➤ Change and Transport System – Overview ➤ Basics of the Change and Transport System ➤ Transport Management System – Concept</td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
</tbody>
</table>
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:

- The enqueue replication server (ERS) is essential for a high-availability system. You need one ERS for the ASCS installed in your system.
Features

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

Note

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

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

You need to discuss your individual HA setup with your HA partner.
The following graphic shows an example of a switchover cluster in more detail:

**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 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

Note

In a standard system [page 22], all mandatory instances except the database instance are normally installed on one host. Therefore, if you are installing a standard system, you can ignore references to other hosts.

The SAP HANA database is normally pre-installed by SAP partners before you start the installation. For more information about how to install the SAP HANA database, see the SAP HANA Server Installation and Update Guide at https://help.sap.com/hana_platform Installation and Upgrade. The database instance is remotely installed by Software Provisioning Manager (the “installer”) from the primary application server host.

However, if you are installing a standard system [page 22] on Linux, you can install SAP systems based on SAP NetWeaver 7.4 or higher on the same host as the SAP HANA database, without applying additional environment settings. For more information, see SAP Note 1953429.

1. You make sure that the SAP HANA database is installed on the SAP HANA host [page 72].
2. You decide how to set connectivity data for your SAP HANA database [page 73].
3. You check that the required operating system users and groups [page 74] are created.
4. You set up file systems [page 78] and make sure that the required disk space is available for the directories to be created during the installation.
5. If you want to use virtual host names, you have to set the environment variable SAPINST_USE_HOSTNAME [page 89]. Alternatively you can specify a virtual host name either in the command to start the installer or - after the installer has started - in the relevant field on the respective instance screen (see Running the Installer [page 114]).
6. If you want to install a high-availability system, you perform switchover preparations [page 89].
7. If you want to share the transport directory trans from another system, export [page 108] this directory to your installation hosts.
8. You install the SAP front-end software [page 90] on the desktop of the user.
9. If required, you configure host names for the SAP HANA database [page 90].
10. You check that the required installation media [page 91] are available on each host.
11. If you decided to use a generic LDAP directory, you have to create a user for LDAP directory access [page 170].
12. You continue with Installation [page 103].

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 74] are created.
2. You set up file systems [page 78] 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 89].
   Alternatively you can specify a virtual host name either in the command to start the installer or - after the installer has started in the relevant field on the respective instance screen (see Running the Installer [page 114]).
4. If you want to share the transport directory trans from another system, export [page 108] this directory to your installation hosts.
5. You install the SAP front-end software [page 90] on the desktop of the user.
6. You check the time zones of the ABAP application server and the SAP HANA system [page 91].
7. You check that the required installation media [page 91] are available.
8. You continue with Installation [page 103].

4.2 Installing the SAP HANA Database

Make sure that the SAP HANA database has been installed before you start the SAP system installation.

For more information about how to install the SAP HANA database, see the SAP HANA Server Installation and Update Guide at https://help.sap.com/hana_platform Installation and Upgrade.

The SAP HANA database is normally part of the SAP HANA appliance. It is normally pre-installed by SAP partners before you start the installation using Software Provisioning Manager (the “installer”). The installer accesses the SAP HANA database remotely to perform the necessary database-specific installation steps.

**Note**

If you are installing a standard system on Linux, you can install your SAP system on the same host as the SAP HANA database. In this case, you must make sure that you include the RAM requirements for the SAP HANA database instance. For more information, see SAP Note 1953429. This scenario is not described in detail in this guide.
4.3 Setting Connectivity Data for the SAP HANA Database

An SAP ABAP system needs connectivity data to log on to the SAP HANA database. This section describes methods for setting up connectivity data.

For SAP HANA database, you can set up the connectivity data using the following methods:

- **Local hdbuserstore container (default method)**
  The local hdbuserstore container has always been available with SAP HANA. It is used in all versions of software provisioning manager. It is the default when you are doing an installation of SAP HANA or a migration to SAP HANA. One hdbuserstore is created for each host for which you installing an ABAP instance.
  The hdbuserstore is stored in the home directory of the user in the sub-folder .hdb/<hostname>.
  Therefore, even if the <SID>adm user has a shared home directory, every host has its own hdbuserstore.
  You can trace the connect method of R3trans by checking the log file trans.log.
  The disadvantage of this method is that there is one hdbuserstore container on each SAP application server. This means that, if you want to change the connectivity data, you have to log on to each server of the system and change the data separately on each server.
  To use this method, you need take no further action since it is the default.

- **Global hdbuserstore container**
  As of SAP HANA Database Revision 93 for clients, you can now store hdbuserstore in a central location.
  The storage location for this method is defined by the value of the environment variable HDB_USE_IDENT (that is, hostname is not used in this method). hdbuserstore is stored in the user’s home directory at the following location:
  /home/<sid>/hdb/<HDB_USE_IDENT>
  HDB_USE_IDENT is the successor to the method that uses a file called installation.ini to set a folder name by using a virtual hostname.

  **Example**
  
  Check the value of the environment variable HDB_USE_IDENT:

  ```
  plx101:cooadm 14> echo $HDB_USE_IDENT
  SYSTEM_GTI
  ```

  Now you can see that hdbuserstore is stored in a directory called SYSTEM_GTI:

  ```
  plx101:cooadm 15> hdbuserstore list
  DATA FILE : /home/cooadm/.hdb/SYSTEM_GTI/SSFS_HDB.DAT
  ```

  By using this method, a global identifier stored in DEFAULT.PFL supports a single unified hdbuserstore in a shared home directory of user <sid>adm.

  To use this method, you start the installation with the parameter HDB_USE_IDENT. For more information, see Running the Installer [page 114].

- **ABAP secure storage in the file system (SSFS)**
  ABAP SSFS is a database-independent method of storing data located inside the SAP system. For more information, see SAP Note 1639578. This functionality is available for SAP HANA as of SAP NetWeaver 7.4.

  To use this method, you start the installation with the parameter HDB_ABAP_SSFS=YES. For more information, see Running the Installer [page 114].
Note that only SAP kernel tools can read from ABAP SSFS. This means that SAP HANA client tools such as hdbsql cannot use ABAP SSFS. Therefore, you might want to choose one application server where you still maintain one hdbuserstore container.

4.4 Creating Operating System Users and Groups

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

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

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

➡️ 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 installer and choose [Generic Installation Options] > [Database] > [Preparation] > [Operating System Users and Groups].
  For more information, see Running the Installer [page 114].
- 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.

- Only valid for 'Platform': AIX
  **AIX**: Make sure that you have set the limits for operating system users as described in SAP Note 323816.

- Only valid for 'Platform': HP-UX, Linux, Oracle Solaris
  **HP-UX, Linux, Oracle Solaris**: Make sure that you have set the limits for operating system users root, <sapsid>adm, and your database-specific operating system users (see also section "Creating Operating System Users and Groups" and "Running the Installer" in the installation guide).

⚠️ 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 csh 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).
<table>
<thead>
<tr>
<th>Output sh</th>
<th>Output ksh</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>cpu time (seconds)</td>
<td>cpu time (seconds)</td>
<td>unlimited</td>
</tr>
<tr>
<td>file size (blocks)</td>
<td>file size (blocks)</td>
<td>unlimited</td>
</tr>
<tr>
<td>data seg size (kbytes)</td>
<td>data size (Kibytes)</td>
<td>unlimited</td>
</tr>
<tr>
<td>stack size (kbytes)</td>
<td>stack size (Kibytes)</td>
<td>8192 KB</td>
</tr>
<tr>
<td>core file size (blocks)</td>
<td>core file size (blocks)</td>
<td>unlimited</td>
</tr>
<tr>
<td>open files</td>
<td>nofile</td>
<td>8192</td>
</tr>
<tr>
<td>max memory size (kbytes)</td>
<td>max memory size (Kibytes)</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

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

The installer chooses available operating system user IDs and group IDs unless you are installing an additional application server instance. On an additional application server instance, you have to enter the same IDs as on the host of the primary application server instance.

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

**Recommendation**

For security reasons, we recommend that you remove the operating system users from the group sapinst after the installer 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 53].

**Users and Groups**

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
<th>Additional Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>root</td>
<td>None</td>
<td>sapinst</td>
<td>Superuser of the UNIX operating system</td>
</tr>
<tr>
<td>&lt;sapsid&gt;adm</td>
<td>sapsys</td>
<td>sapinst</td>
<td>SAP system administrator</td>
</tr>
</tbody>
</table>

**Groups and Members**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapsys</td>
<td>&lt;sapsid&gt;adm</td>
</tr>
<tr>
<td>sapinst</td>
<td>root,&lt;sapsid&gt;adm</td>
</tr>
</tbody>
</table>

**SAP Host Agent:**
### User and Groups of the SAP Host Agent

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
<th>Additional Group</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapadm</td>
<td>sapsys</td>
<td>–</td>
<td>SAP Host Agent administrator</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapsys</td>
<td>sapadm</td>
</tr>
<tr>
<td>sapinst</td>
<td>sapadm</td>
</tr>
</tbody>
</table>

### 4.5 Required File Systems and Directories

**Note**

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

### Related Information

- **SAP Directories** [page 79]
- **SAP HANA Database Client Directory** [page 85]
- **Setting Up File Systems for a High-Availability System** [page 85]
4.5.1 SAP Directories

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

The installer creates the following types of directories:

- Physically shared directories
- Logically shared directories
- Local directories

Only valid for 'Platform': HP-UX

HP-UX: For recommendations about block size and mount option configuration, see SAP Note 1077887.

Directories of the SAP System

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

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

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

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

- Directory Structure for an ABAP System Based on SAP NetWeaver 7.1 to 7.4:
  In SAP systems based on SAP NetWeaver 7.1 to 7.4 the primary application server instance is named DVEBMGS<Instance_Number>.
Every new installation of an ABAP standalone system is Unicode (directory uc – Unicode).

**Physically Shared Directories (SAP System)**

Physically shared directories reside on the global host and are shared by Network File System (NFS). The installer creates the following directories:

- The directory `/<sapmnt>/`<SAPSID>`, which contains SAP kernel and related files, is created on the first installation host. Normally, the first installation host is the host on which the central services instance is to run, but you can also choose another host for `/<sapmnt>/`<SAPSID>`. You need to manually share this directory with Network File System (NFS) and – for a distributed system such as a high-availability system or a system with additional application server instances – mount it from the other installation hosts.

The installer creates the following shared subdirectories in `/<sapmnt>/`<SAPSID>` during the SAP system installation. If you install an SAP system with instances distributed over several hosts, you have to share these directories for all hosts with the same operating system (see **Exporting and Mounting Global Directories** [page 109]):

- **global**
- **profile**
  - Contains the profiles of all instances
- **exe**
  - Contains a folder uc and a folder nuc, each with a platform-specific subfolder:
    - `<sapmnt>/`<SAPSID>/exe/uc/<platform>` is used in Unicode systems.
Executable kernel programs are replicated from this directory to the `exe` directories of each Unicode system instance.

- `<sapmnt>/<SAPSID>/exe/nuc/<platform>` is used in non-Unicode systems (see below).

Executable kernel programs are replicated from this directory to the `exe` directories of each non-Unicode system instance (see below).

- Contains a folder `jvm` with the SAP JVM files

- `Contains a folder `jvm` with the SAP JVM files`<br>

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

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

For more information, see `Exporting and Mounting the Global Transport Directory [page 108]`.

**Physically Shared SAP Directories**

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

**Logically Shared Directories (SAP System)**

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

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

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

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

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

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

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

**Local Directories (SAP System)**
The installer also creates local directories that reside on the local hosts. The directory `/usr/sap/<SAPSID>` contains files for the operation of a local instance as well as symbolic links to the data for one system. This directory is physically located on each host in the SAP system and contains the following subdirectories:

- SYS

**Note**

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

- Instance-specific directories with the following names:
  - SAP systems based on SAP NetWeaver 7.1 to 7.4:
    - The directory of the primary application server instance is called DVEBMGS<Instance_Number>.
    - The directory of an additional application server instance is called D<Instance_Number>.
    - The directory of an application server instance (primary application server instance and additional application server instances) is called D<Instance_Number>.
  - The directory of the ABAP central services instance (ASCS) instance is called ASCS<Instance_Number>.
  - The directory of an enqueue replication server instance (ERS) instance is called ERS<Instance_Number>.

If you install a high-availability system, you must install an ERS instance for the ASCS instance.

### Local SAP Directories

<table>
<thead>
<tr>
<th>Directory</th>
<th>Description</th>
<th>Required Minimum Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/DVEBMGS&lt;Instance_Number&gt;</code></td>
<td>SAP systems based on SAP NetWeaver 7.1 to 7.4:</td>
<td>- SAP Business Warehouse server only: minimum 25 GB</td>
</tr>
<tr>
<td></td>
<td>Primary application instance directory</td>
<td>- Other installations: minimum 4 GB</td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/&lt;Instance_Number&gt;</code></td>
<td>SAP systems based on SAP NetWeaver 7.5:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additional application server instance directory</td>
<td>- SAP Business Warehouse server only: minimum 25 GB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Other installations: minimum 4 GB</td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/ASCS&lt;Instance_Number&gt;</code></td>
<td>ABAP central services (ASCS) instance directory</td>
<td>Minimum 2 GB</td>
</tr>
<tr>
<td></td>
<td>(high availability only)</td>
<td></td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/ERS&lt;Instance_Number&gt;</code></td>
<td>Enqueue replication server (ERS) instance directory for the ASCS (high availability only)</td>
<td>Minimum 2 GB</td>
</tr>
</tbody>
</table>
Directories of the SAP Host Agent

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

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
4.5.2 SAP HANA Database Client Directory

This is the directory for the SAP HANA database client:

/usr/sap/<SAPSID>/hdclient

For the space required, see the table Hardware Requirements in Hardware and Software Requirements Tables [page 40].

4.5.3 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 68] and contact your HA partner.

Context

From the perspective of an SAP application, there are the following types of SAP Directories [page 79]:

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

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

   The SAP directories `/sapmnt/<SAPSID>` and `/usr/sap/trans` are usually mounted from a Network File System (NFS). However, an SAP instance directory `/usr/sap/<SAPSID>/<Instance_Type>_<Instance_Number>` that you want to prepare for HA has always to be mounted on the cluster node currently running the instance. Do **not** mount such directories with NFS.

   Therefore, if the host running the primary application server instance is **not** the NFS server host, you might have to mount the file systems for `/sapmnt/<SAPSID>` and `/usr/sap/trans` on different physical disks from the file system for `/usr/sap/<SAPSID>/<Instance_Type>_<Instance_Number>`.

   **Caution**

   To start or stop an SAP instance, you have to do one of the following:
   - Make the physically shared SAP directories under `/sapmnt/<SAPSID>` available to the server beforehand.
   - Replace the links in `/usr/sap/<SAPSID>/SYS` by a physical copy.
   Consult your HA partner to clarify the best solution for the cluster software.

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

   The `/usr/sap/<SAPSID>` directory contains at least two subdirectories (see also SAP Directories [page 79]):
   -SYS, which contains links to the central directory `/sapmnt/<SAPSID>`
   - `<Instance_Type>_<Instance_Number>` – where the name is defined by the type of services and the application server number:
     - DVEBMGS<Instance_Number> – which contains data for the primary application server instance
     - D<Instance_Number> – which contains data for an additional application server instance
     - ASCS<Instance_Number> – which contains data for the ABAP central services instance

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

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

   The instance-specific directory name for the ABAP central services instance is normally `ASCS<Instance_Number>`. Migrating only these directories avoids mount conflicts when switching over to a node on which another application server instance is already running. The `ASCS<Instance_Number>` directory can join the `/usr/sap/<SAPSID>` tree instead of mounting on top of it.
**Note**

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

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

**Example**

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

Note that this is only an example. For more information on a setup that meets your needs, consult your HA partner.
Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 to 7.5x on UNIX: SAP HANA Database

Preparation

File Systems and Disks in an HA Setup

Key:
- Mount point before switchover
- Mount point after switchover
- NFS mount point

Node B fails
Node A fails
4.6 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 ASCS instance in a cluster.

Procedure

Proceed as described in SAP Note 962955.

4.7 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 89], you have to set the installer property SAPINST_USE_HOSTNAME to specify the required virtual host name before you start the installer. Alternatively, you can specify the virtual host name in the relevant field on the respective instance screen.

For more information, see SAP System Parameters [page 53].
Procedure

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

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

4.8 Installing the SAP Front-End Software

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

Procedure

1. Check SAP Note 147519 for the recommended SAP front-end release.
2. Install the SAP front-end software required for your SAP system release as described in the documentation SAP Frontend Installation Guide - <Release> at: https://wiki.scn.sap.com/wiki/display/ATopics/SAP+GUI+Family.

4.9 Configuring Host Names for the SAP HANA Database

You need to perform this procedure if you want to use virtual host names or if your SAP HANA database is located in a separate network.

Context

During the dialog phase, the installer prompts you for the parameters to connect to your SAP HANA database. However, the database host name that you enter is not used directly. Instead, the external host name of the database is determined and subsequently used.
**Procedure**

Make sure that the external host name of the database is correctly maintained.

For more information on how to do this, see SAP Note [1930853](https://help.sap.com/viewer/p/SAP_HANA_PLATFORM) or section Mapping Host Names for Database Client Access in the SAP HANA Administration Guide, available here:


---

**4.10 Checking Time Zones**

Before you start the installer, you need to check time zone settings.

**Context**

Before you start the installer, compare the following time zone settings:

- The time zone of the target host for the ABAP application server
- The time zone of the `<sid>`adm user of the SAP HANA system

Check the relevant SAP HANA time zone by logging on to the system at the command line with your user `<sid>`adm and then using command `date`.

**Procedure**

If the systems have different time zones, proceed as follows:

- Change the time zone of the ABAP system (recommended solution)
- If the time zone of the ABAP system cannot be changed, change the time zone of the SAP HANA system.


---

**4.11 Preparing the Installation Media**

This section describes how to prepare the installation media.

Installation media are available as follows:

- The Software Provisioning Manager 1.0 archive containing the installer
  You always have to download the latest version of the Software Provisioning Manager 1.0 archive.
• The complete media or dedicated installation archives (SAR files) containing the software to be installed, which are available as follows:
  ○ You can use the physical installation media as part of the installation package as described in Using the Physical Media from the Installation Package [page 95].
  ○ You download the complete installation media as described in Downloading Complete Installation Media [page 101].
  ○ As an alternative to downloading the complete SAP kernel media, you can do one of the following:
    ○ Download the SAP kernel archives (SAR files). For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 97].

  **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 - are only prompted if they cannot be retrieved from the primary application server instance or the ASCS instance of the existing SAP system.

  **Note**

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

  For example: The installer might require a certain PL of <X> of the SAPEXEDB.SAR (for DBTYPE <Y>), but this PL of the SAPEXEDB.SAR is not contained in the SAP kernel media. In this case you have to download the required PL from https://launchpad.support.sap.com/#/softwarecenter following the instructions in Downloading SAP Kernel Archives (Archive-Based Installation) [page 97].

  **Note**

  If you are using a stack configuration file (see Installation Using a Stack Configuration File [page 36]), 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.

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

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

**Related Information**

Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 93]
4.11.1 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.

Context

You require the latest version of 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. For more information about how to get this tool, see the Procedure section below.

An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuptool - which were available so far only in the SAPEXEDB.SAR archive of the kernel media, has now been made available in the Software Provisioning Manager archive (SWPM10SP<Support_Package_Number>_<Version_Number>.SAR), in a sub-archive named LOADTOOLS.SAR, located in the COMMON/LOADTOOLS folder. For an installation using kernel version 7.40 or higher, the load tools from the SWPM10SP<Support_Package_Number>_<Version_Number>.SAR are used automatically instead of the load tools available in the SAPEXEDB.SAR archive of the kernel media. There is no action required from your side, the installer uses the relevant load tools automatically once you run it from the extracted SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive.

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/sitoolset\n\nSystem Provisioning  Download Software Provisioning Manager

2. Make sure that you use the latest version of the SAPCAR tool when manually extracting the Software Provisioning Manager archive.

i  Note

An older SAPCAR version might extract archive files in a wrong way and this could prevent the installer from working consistently.
Proceed as follows to get the latest version of SAPCAR:

a. Go to https://launchpad.support.sap.com/#/softwarecenter SUPPORT PACKAGES & PATCHES and search for "sapcar".

b. Select the archive file for your operating system and download it to an empty directory.

c. Rename the executable to sapcar.exe.

For more information about SAPCAR, see SAP Note 212876.

3. Using the latest version of SAPCAR, you can verify the 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 sapcryptolibp_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 signature of the downloaded SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive by executing the following command:

```
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>
```

4. 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 <Path to Unpack Directory>
```

**Note**

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

**Caution**

Make sure that you unpack the Software Provisioning Manager archive to a dedicated folder. Do not unpack it to the same folder as other installation media.
4.11.2 Using the Physical Media from the Installation Package

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

Context

The signature of media is checked automatically by the installer during the Define Parameters phase while the Media Browser screens are processed (see also Running the Installer [page 114]). The installer only accepts media whose signature has been checked. For more information, see SAP Note 2393060.

Procedure

1. Identify the required media for your installation [page 22] as listed below.

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required Software Packages from Installation Media</th>
</tr>
</thead>
</table>
| ABAP Central services instance (ASCS instance) | ○ Software Provisioning Manager 1.0 archive  
| | ○ UC or NUC Kernel (folder K_<Version>_<N or U>_<_OS>) where U means Unicode and N means non-Unicode. |
| | **Note**  
| | Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release. |
| Database instance | ○ Software Provisioning Manager 1.0 archive  
| | ○ UC or NUC Kernel (folder K_<Version>_<N or U>_<_OS>) where U means Unicode and N means non-Unicode. |
| | **Note**  
| | Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release. |
| | ○ Database client software  
| | ○ Installation Export (folders EXP*) |
### SAP Instance Installation

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required Software Packages from Installation Media</th>
</tr>
</thead>
</table>
| Enqueue Replication Server | ○ Software Provisioning Manager 1.0 archive  
○ UC or NUC Kernel (folder K_<Version>_<N or U>_<OS>) where U means Unicode and N means non-Unicode. |

**Note**

Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release.

| Primary application server instance | ○ Software Provisioning Manager 1.0 archive  
○ UC or NUC Kernel (folder K_<Version>_<N or U>_<OS>) where U means Unicode and N means non-Unicode. |

**Note**

Every new installation of an SAP system is Unicode. You can only use the non-Unicode kernel if you perform the system copy for a non-Unicode SAP system that has been upgraded to the current release.

| Additional application server instance | ○ Software Provisioning Manager 1.0 archive  
○ UC or NUC Kernel (folder K_<Version>_<N or U>_<OS>) where U means Unicode and N means non-Unicode. |

**Note**

If you install an additional application server instance in an existing non-Unicode system, the additional application server instance is created automatically as a non-Unicode instance. The installer checks whether a non-Unicode system exists and chooses the right executables for the system type.

| SAP Host Agent (Separate Installation Only) | ○ SAP SCM only: SAP liveCache  
○ Database Client Software |

### SAP Host Agent (Separate Installation Only)

#### Required Media

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required Media</th>
</tr>
</thead>
</table>
| SAP Host Agent (separate installation only) | ○ Software provisioning manager 1.0 archive  
○ UC Kernel (folder K_<Version>_U_<OS>) where U means Unicode. |

2. Make the installation media available on each installation host as follows:
   a. Download and unpack the latest version of Software Provisioning Manager as described in [Downloading and Extracting the Software Provisioning Manager 1.0 Archive](#).
b. Use the SAP HANA database client revision matching your HANA database. You can find the correct database client here:


From here download and extract the correct file IMDB_CLIENT100_*_.SAR.

Note

If you are unable to download the SAP HANA database client revision matching your HANA database from SAP Service Marketplace or if the version there is no more recent than that on the installation medium, you can use the version of the database client from the installation medium.

c. Make the media containing the software to be installed available.

You can do this in one of the following ways:
- Copy the required media folders directly to the installation hosts.
- Mount the media on a central media server that can be accessed from the installation hosts.

Caution

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

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

Related Information

Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 93]

4.11.3 Downloading SAP Kernel Archives (Archive-Based Installation)

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

Context

The signature of installation archives is checked automatically by the installer [page 114] during the Define Parameters phase while processing the Software Package Browser screens. The installer only accepts archives
whose signature has been checked. After scanning the archives and verifying the 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. For more information, see SAP Note 2393060.

**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 93].

2. Go to [https://launchpad.support.sap.com/#/softwarecenter](https://launchpad.support.sap.com/#/softwarecenter) » SUPPORT PACKAGES & PATCHES » By Category

3. Choose the required software component, release, and technical stack:
   - If you want to install SAP S/4HANA <Release> Server, choose SAP APPLICATION COMPONENTS
     + SAP S/4HANA > SAP S/4HANA <Release> > SAP S/4HANA SERVER
   - If you want to install AS ABAP for SAP S/4HANA Frontend, choose SAP NetWeaver and complementary products
     + AS ABAP FOR S/4HANA FRONTEND > AS ABAP <Release> FOR S/4 HANA <Release>
   - If you want to install SAP BW/4HANA <Release>, choose SAP NetWeaver and complementary products
     + SAP BW/4HANA > SAP BW/4HANA <Release> > SAP BW/4HANA SERVER
   - If you want to install SAP NetWeaver AS for ABAP 7.52, choose SAP NetWeaver and complementary products
     + NW AS ABAP INNOVATION PKG > NW AS ABAP 7.52
   - If you want to install SAP NetWeaver AS for ABAP 7.51 innovation package, choose SAP NetWeaver and complementary products
     + NW AS ABAP INNOVATION PKG > NW AS ABAP 7.51 INNOVATION PKG
   - If you want to install AS ABAP FOR OOEM, choose SAP NetWeaver and complementary products
     + NW AS ABAP INNOVATION ABAP FOR OOEM
   - If you want to install SAP NetWeaver Mobile 7.1, choose SAP NetWeaver and complementary products
     + SAP NETWEAVER MOBILE > <Release> > Entry by Component
   - If you want to install an SAP NetWeaver ABAP system, choose SAP NetWeaver and complementary products
     + SAP NetWeaver > <Release> > [For releases lower than 7.5: Entry by Component] > Application Server ABAP
   - If you want to install an SAP Business Suite system based on SAP NetWeaver, choose SAP Application Components > <SAP CRM | SAP ERP | SAP SCM | SAP SRM> > <Release> > Entry by Component > <ABAP Product Instance>

4. Choose the required package:

   **Note**
   If you perform an additional application server installation, kernel archives - such as SAPEXE<Version>.SAR, SAPEXEDB<Version>.SAR, IGSEXE<Version>.SAR,
**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 7.42 EXT, then `SAPEXEDB<Version>.SAR` must also be of version 7.42 EXT.
- If `SAPEXE<Version>.SAR` is of version 7.45, then `SAPEXEDB<Version>.SAR` must also be of version 7.45.

- If you provide the archives in one download folder, and there is more than one version of the same archive available - for example `SAPEXE<Version>.SAR` - and these versions match the product-specific requirements, the installer selects one of these archive versions. If you want a specific archive version to be used, make sure that this is the only version available in the download folder. When running system provisioning in GUI mode, you can also check in the GUI which archive is being used. So even if there is more than one version of the same archive available in the download folder, you can select the exact archive version you want to use and enter the exact path to the required archive file.

- `SAPEXE<Version>.SAR`
  - `SAP KERNEL <Version><UC><Operating System> DATABASE INDEPENDENT`
    - If you want to install an SAP system based on SAP NetWeaver AS for ABAP 7.52 or higher, you can only choose 7.49 UNICODE for `SAP KERNEL <Version>`.
    - If you want to install an SAP system based on SAP NetWeaver AS for ABAP 7.51 innovation package or higher, you can either choose 7.45 or 7.49 UNICODE for `SAP KERNEL <Version>`.
    - If you want to install an SAP system based on SAP NetWeaver 7.5, you can either choose 7.45 or 7.49 UNICODE for `SAP KERNEL <Version>`.
    - If you want to install an SAP system based on SAP NetWeaver 7.4, you can choose either 7.45 or 7.42 for `SAP KERNEL <Version>`.
    - If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1 or lower, choose 7.21 EXT for `SAP KERNEL <Version>`.
  - `SAPEXEDB<Version>.SAR`
    - Choose the version corresponding to the `SAPEXE<Version>.SAR` from `SAP KERNEL <Version>`.

- `igsexe<version>.sar`
  - `SAP IGS <Version><Operating System>`
    - If you want to install an SAP system based on SAP NetWeaver Application Server for ABAP 7.52, choose `SAP IGS <7.49 or 7.53> OS independent`.

---

**Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 to 7.5x on UNIX: SAP HANA Database**

**Preparation**
If you want to install an SAP system based on SAP NetWeaver Application Server for ABAP 7.51
innovation package, choose [SAP IGS <7.45 or 7.49> # OS independent] depending on your SAPEXE<Version>.SAR version.

If you want to install an SAP system based on SAP NetWeaver 7.5, choose [SAP IGS <7.45 or 7.49> # OS independent] depending on your SAPEXE<Version>.SAR version.

If you want to install an SAP system based on SAP NetWeaver 7.4 and your
SAPEXE<Version>.SAR is of version <7.45 or 7.49>, then choose [SAP IGS <7.45 or 7.49> # OS independent] depending on your SAPEXE<Version>.SAR version. Otherwise, choose [SAP IGS 7.20_EXT # OS independent].

If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1, choose [SAP IGS 7.3 EHP1] # OS independent

If you want to install an SAP system based on SAP NetWeaver 7.3 or lower and use SAP kernel 7.21, choose [SAP IGS 7.20 # OS independent] # Operating System

If you want to install an SAP system based on SAP NetWeaver 7.3 or lower and use SAP kernel 7.21, choose [SAP IGS 7.20 # Operating System]

igshelper<version>.sar
If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1 or higher, choose [SAP IGS HELPER # OS independent]

If you want to install an SAP system based on SAP NetWeaver 7.3 or lower, choose [SAP IGS 7.20 # Operating System]

SAPHOSTAGENT<Version>.SAR
[SAP HOST AGENT 7.21 # Operating System]

**Recommendation**

It is highly recommended that you always choose the highest SP version of the SAPHOSTAGENT<SP-version>.SAR archive.

**Note**

The SAPHOSTAGENT<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 SAPHOSTAGENT<Version>.SAR. Otherwise, the existing SAP Host Agent is not upgraded.

5. If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1 or lower - that is you have to use SAP kernel 7.21 - download the latest patch level of SAPCRYPTOLIB <Version>.SAR from the following path:

6. Make the physical media required for the database installation available either by using physical media as described in Using the Physical Media from the Installation Package [page 95] or by downloading them as described in Downloading Complete Installation Media [page 101].

4.11.4 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 93].
2. Create a download directory on the host where you want to run the installer.
3. You identify the required media as listed in Using the Physical Media from the Installation Package [page 95].
4. Identify all download objects that belong to one medium according to one of the following:

   **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://support.sap.com/sltoolset | System Provisioning | Software Provisioning Manager 1.0 SP<Current Version> | Download Kernel releases delivered for SL Toolset | SL TOOLSET 1.0 (INSTALLATIONS AND UPGRADES) | KERNEL FOR INSTALLATION/SWPM.
     ○ To download all 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>
     ○ Material number
     All download objects that are part of an installation medium have the same material number and an individual sequence number:
     <Material_Number>_<Sequence_Number>

Example
51031387_1
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.

5. Download the objects to the download directory.
6. 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.

Note

The SAP HANA database is normally pre-installed by SAP partners before you start the installation. For more information about how to install the SAP HANA database, see the SAP HANA Server Installation and Update Guide at https://help.sap.com/hana_platform. The contents of the database instance are remotely installed by Software Provisioning Manager (the “installer”) from the primary application server host.

However, on Linux you can install SAP systems based on SAP NetWeaver 7.4 or higher on the same host as the SAP HANA database - that is as a standard system - without applying additional environment settings. For more information, see SAP Note 1953429.

Standard System

1. You check the prerequisites and run the installer to install the SAP system.

   Note

   In a standard system, all mandatory instances except the database instance are installed on one host.

2. You continue with Post-Installation.

 Distributed System

1. If you want to share the transport directory from another system, you have to mount it from this system. Otherwise, we recommend that you share the directory that is created during the installation of the primary application server instance.
2. On the **ASCS instance host**, you do the following:
   1. You **check the prerequisites** [page 111] and **run the installer** [page 114] to install the ABAP central services instance (ASCS instance).

   **Note**
   
   If you want to install an ASCS instance with integrated SAP Web Dispatcher [page 29] or with integrated SAP Gateway [page 31] or both, you must choose the **Custom** parameter mode.
   
   When processing the screens for the ASCS instance installation, you are prompted to mark the corresponding checkbox on the screen **Additional Components to be Included in the ASCS 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 109] in `<sapmnt>/<SAPSID>` to the database and primary application server instance host.

3. On the **primary application server instance host**, you do the following:
   1. You **mount the global directories** [page 109] in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
   2. You **check the prerequisites** [page 111] and **run the installer** [page 114] to install the contents of the database instance and then the primary application server instance.
   3. If you want to use the shared transport directory `trans` from another system, you also **mount** [page 108] this directory.
4. You continue with **Post-Installation** [page 128].

**Graphical Overview**

The following figure shows how you install the various instances in a distributed system:
High-Availability System

1. You make sure that you have already prepared the standby node, host B. You ought to have already made sure that it meets the hardware and software requirements and that it has all the necessary file systems, mount points, and (if required) Network File System (NFS). This is described in Performing Switchover Preparations for High Availability [page 89] and Setting Up File Systems for a High Availability System [page 85].

2. If you want to share the transport directory trans from another system, you have to mount [page 108] it from this system. Otherwise we recommend that you share the trans directory that is created during the installation of the primary application server instance (see below).

3. You set up the switchover cluster infrastructure as follows:

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

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

   In this case, you require:

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

   1. You check the prerequisites [page 111] and run the installer [page 114] to install the ABAP central services instance (ASCS instance) on the primary cluster node, host A. Use a virtual host name [page 89].

      Note
      If you want to install an ASCS instance with integrated SAP Web Dispatcher [page 29] or with integrated SAP Gateway [page 31] or both, you must choose the Custom parameter mode.

      When processing the screens for the ASCS instance installation, you are prompted to mark the corresponding checkbox on the screen Additional Components to be Included in the ASCS 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 111] and run the installer [page 114] to install the enqueue replication server instance (ERS instance) for the ASCS instance on the primary cluster node, host A. Use a virtual host name [page 89].

   3. You export global directories [page 109] 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 38] and it has all the necessary file systems [page 85], mount points, and (if required) Network File System (NFS).

   5. You set up the user environment on the standby node, host B:

      ○ You use the same user and group IDs as on the primary node.
○ You create the home directories of users and copy all files from the home directory of the primary node.

For more information about the required operating system users and groups, see Creating Operating System Users [page 74].

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

7. You repeat the following steps until you have finished installing the enqueue replication server (ERS instance) on all nodes in the cluster:
   1. You perform the switchover to a node where you want to install the enqueue replication server instance (ERS instance) for the ASCS instance.
   2. You check the prerequisites [page 111] and run the installer [page 114] to install the enqueue replication server instance (ERS instance) for the ASCS instance on the standby node, host B.

4. 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.

5. You continue with Post-installation [page 128].

Graphical Overview

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

Additional Application Server Instance

Installation Steps for Additional Application Server Instances for a Standard System
1. If you want to install additional application server instances on a host different from the SAP system host, you export global directories in `<sapmnt>/<SAPSID>` to the hosts on which you want to install additional application server instances.

2. On every **additional application server instance host**, you do the following:
   1. If you want to install additional application server instances on a host different from the SAP system host, you **mount the global directories [page 109]** in `<sapmnt>/<SAPSID>` that you exported from the SAP system host.
   2. You **check the prerequisites [page 111]** and **run the installer [page 114]** to install the additional application server instance.

3. You continue with **Post-Installation [page 128]**.

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

1. If you want to share the transport directory `trans` from another system, you have to **mount [page 108]** 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 109]** in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
   2. You **check the prerequisites [page 111]** and **run the installer [page 114]** to install the additional application server instance.
   3. If you want to use the shared transport directory `trans` from another system, also **mount [page 108]** this directory.

4. You continue with **Post-Installation [page 128]**.

**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 108]** 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 109]** in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
   2. You **check the prerequisites [page 111]** and **run the installer [page 114]** 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 108]** this directory.

4. You continue with **Post-Installation [page 128]**.
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.

For more information, see the SAP Library at:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Library Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3</td>
<td>Application Help &gt; Function-Oriented View: English</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw73/">http://help.sap.com/nw73/</a></td>
<td>Application Server &gt; Application Server ABAP</td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Administration of Application Server ABAP &gt; Change and Transport System &gt; Change and Transport System - Overview &gt; Basics of the Change and Transport System &gt; Transport Management System - Concept</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw731/">http://help.sap.com/nw731/</a></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
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<tr>
<td><a href="http://help.sap.com/nw74/">http://help.sap.com/nw74/</a></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
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<tr>
<td><a href="http://help.sap.com/nw75/">http://help.sap.com/nw75/</a></td>
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</tr>
<tr>
<td>SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
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<tr>
<td><a href="https://help.sap.com/nw751abap/">https://help.sap.com/nw751abap/</a></td>
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<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
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</tr>
<tr>
<td><a href="https://help.sap.com/nw752abap/">https://help.sap.com/nw752abap/</a></td>
<td></td>
</tr>
</tbody>
</table>

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

1. Exporting the Transport Directory
   a. Log on as user root to the host where the transport directory /usr/sap/trans resides.
   b. Make sure that /usr/sap/trans belongs to the group sapsys and to the user root.
   c. If not already done, export the directory using Network File System (NFS).

2. Mounting the Transport Directory

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

   a. Create the mount point /usr/sap/trans.
   b. Mount /usr/sap/trans using Network File System (NFS) from the exporting host.

Related Information

Exporting and Mounting Directories via NFS for Linux [page 173]
Exporting and Mounting Directories via NFS for AIX [page 171]
Exporting and Mounting Directories via NFS for Oracle Solaris [page 175]
Exporting and Mounting Directories via NFS for HP-UX [page 172]

5.3 Exporting and Mounting Global Directories

If you install 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.
Procedure

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

2. Log on to the host of the new instance that you want to install as user root.

3. Create the following mount points and mount them from the SAP global host:
   
   `<sapmnt>/<SAPSID>/exe`
   `<sapmnt>/<SAPSID>/profile`
   `<sapmnt>/<SAPSID>/global`

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

Related Information

- Exporting and Mounting Directories via NFS for Linux [page 173]
- Exporting and Mounting Directories via NFS for AIX [page 171]
- Exporting and Mounting Directories via NFS for Oracle Solaris [page 175]
- Exporting and Mounting Directories via NFS for HP-UX [page 172]

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 Central User Management
1. You install your SAP system as described in this installation guide.
2. Add the system to Central User Administration (CUA). For more information, see Configuring User Management [page 150].

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 150].

5.5 Prerequisites for Running the Installer

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

- For the SL Common GUI, 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 Common GUI: Google Chrome, Mozilla Firefox, Microsoft Edge, or Microsoft Internet Explorer 11. Always use the latest version of these web browsers.
    - Recommendation
      We recommend using Google Chrome.
    - If you copy the SL Common GUI 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 Common GUI.
      For more information about the SL Common GUI, see Useful Information About the Installer [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 installer. While running the installer, 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.

- We recommend that you use the csh shell for the installation. If you want to use another shell, make sure that you have read SAP Note 202227.
  The installer uses csh scripts during the installation to obtain the environment for user <sapsid>adm.
  This is also true if user <sapsid>adm already exists from an earlier SAP system installation, and the shell of this user is not csh. Before you start the installer, execute the following command as user <sapsid>adm to make sure that the csh scripts are up-to-date:
  
  ```
  /bin/csh -c "source /home/<sapsid>/cshrc;env"
  ```
● Make sure that your operating system does not delete the contents of the temporary directory `/tmp` or the contents of the directories to which the variables `TEMP`, `TMP`, or `TMPDIR` point, for example by using a `crontab` entry.

Make sure that the temporary directory has the permissions 777.

● Make sure that you have at least 300 MB of free space in the installation directory for each installation option. In addition, you need 300 MB free space for the installer executables. If you cannot provide 300 MB free space in the temporary directory, you can set one of the environment variables `TEMP`, `TMP`, or `TMPDIR` to another directory with 300 MB free space for the installer executables.

You can set values for the `TEMP`, `TMP`, or `TMPDIR` environment variable to an alternative installation directory as described in section Useful Information About the Installer [page 120].

● Make sure that `umask` is set to 022 for the user with `root` permissions that you want to use for running the installer.

As the user with `root` permissions that you want to use for running the installer, enter the following command: `umask 022`.

- 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, Linux, Oracle-Solaris: Make sure that you have set the limits for operating system users `root`, `<sapsid>`adm, and your database-specific operating system users (see also section "Creating Operating System Users and Groups" and "Running the Installer" in the installation guide).

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 `csh` 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).

<table>
<thead>
<tr>
<th>Output</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>cputime</td>
<td>unlimited</td>
</tr>
<tr>
<td>filesize</td>
<td>unlimited</td>
</tr>
<tr>
<td>datasize</td>
<td>unlimited</td>
</tr>
<tr>
<td>stacksize</td>
<td>8192 KB</td>
</tr>
<tr>
<td>coredumpsize</td>
<td>unlimited</td>
</tr>
<tr>
<td>descriptors</td>
<td>8192</td>
</tr>
</tbody>
</table>
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).

<table>
<thead>
<tr>
<th>Output</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>memoryuse</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

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

### Make sure

- 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 39].
- Make sure that the database is up and running before starting the installation.
- 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


- 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 installer and the SL Common GUI.
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 installer processing.
  The filled-out evaluation form is then sent to SAP using HTTPS.
- If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:

```
SAPINST_HTTP_PORT=<Free Port Number>
```

5.6 Running the Installer

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

Prerequisites

For more information, see Prerequisites for Running the Installer [page 111].

Context

Software Provisioning Manager (the “installer” for short) has a web browser-based GUI named “SL Common GUI of the Software Provisioning Manager” - “SL Common GUI” for short.

This procedure describes an installation where you run the installer and use the SL Common GUI, that is you can control the processing of the installer from a browser running on any device.

For more information about the SL Common GUI, see Useful Information About the Installer [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 installer has not set any environment variables for a different SAP system or database.

   If your security policy requires that the person running the installer 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 have to 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 91].

i  Note

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

For example: The installer might require a certain PL of `<X>` of the `SAPEXEDB.SAR` (for DBTYPE `<Y>`), but this PL of the `SAPEXEDB.SAR` is not contained in the SAP kernel media. In this case you have to download the required PL from https://launchpad.support.sap.com/#/softwarecenter following the instructions given in Downloading SAP Kernel Archives (Archive-Based Installation) [page 97].

→ Recommendation

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

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 installer from the directory to which you unpacked the Software Provisioning Manager archive by entering the following commands:

```
<Path_To_Unpack_Directory>/sapinst
```

i  Note

If you are using a stack configuration file (see Installation Using a Stack Configuration File (Optional) [page 36]), you have to 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 a virtual host name to the instance to be installed and you do not want to assign it by entering it as a parameter using the installer screens (see SAP System Parameters [page 53]), you can alternatively assign it by starting the installer with the `SAPINST_USE_HOSTNAME` property:

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

For more information, see Using Virtual Host Names [page 89].
Note
If you want to set the connectivity data for your SAP HANA database, you can add parameters when calling `sapinst` as follows (for more information, see Setting Connectivity Data for the SAP HANA Database [page 73]):

- Global hdbuserstore container
  ```bash
  /<Path_To_Unpack Directory>/sapinst HDB_USE_IDENT=SYSTEM_<SID>
  ```
  You do not have to set `HDB_USER_IDENT` to the suggested value `SYSTEM_<SID>`. If you prefer, you can use the characters A-z, 0-9, or _.

- ABAP secure storage in the file system (SSFS) – only available for SAP NetWeaver 7.4 and higher:
  ```bash
  /<Path_To_Unpack Directory>/sapinst HDB_ABAP_SSFS=YES
  ```

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

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

4. The installer is starting up.

The installer now starts and waits for the connection with the SL Common GUI.

You can find the URL you require to access the SL Common GUI at the bottom of the shell from which you are running the installer.

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

If you have a supported web browser (see Prerequisites for Running the Installer [page 111]) installed on the host where you run the installer, you can open this URL directly in the shell. Otherwise open the URL in a supported web browser that runs on another device.

The SL Common GUI opens in the browser by displaying the Welcome screen.

Note
Before you reach the Welcome screen, your browser might warn you that the certificate of the `sapinst` process on this computer could not be verified. Accept this warning to inform your browser that it can trust this site, even if the certificate could not be verified.

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

- Perform preparations
  ```bash
  Go to ▶ Generic Options ▶ <Database> ▶ Preparations ▶
  ```
  and choose the required task.
● Install an SAP system:
  ○ To install an SAP system based on SAP NetWeaver Application Server for ABAP, choose
    \(<\text{Product}\>\ <\text{Database}\>\ <\text{Installation}\>\ <\text{Application Server ABAP}\>\ <\text{System Variant}\>\.
  ○ To install the application server ABAP for an SAP Process Integration system based on SAP NetWeaver 7.5, choose \(<\text{SAP NetWeaver 7.5}\>\ <\text{Database}\>\ <\text{Installation}\>\ <\text{Application Server ABAP for SAP Process Integration}\>\ <\text{System Variant}\>\.
  ○ To install the application server ABAP for an SAP Solution Manager 7.2 system, choose \(<\text{SAP Solution Manager 7.2}\>\ <\text{Support_Release}\>\ <\text{Database}\>\ <\text{System}\>\ <\text{Application Server ABAP}\>\ <\text{System Variant}\>\.
  ○ Install an additional application server instance
    Go to \(<\text{Product}\>\ <\text{Database}\>\ <\text{Additional SAP System Instances}\>\ <\text{Additional Application Server Instance}\>\.
  ○ Perform other tasks or install additional components
    Go to \(<\text{Product}\>\ <\text{Database}\>\ <\text{Generic Options}\>\ <\text{Custom Options}\>\ <\text{Required Task}\>\.

6. Choose Next.

● Note
If there are errors during the self-extraction process of the installer, you can find the log file dev_selfex.out in the temporary directory.

7. Follow the instructions on the installer screens and enter the required parameters.

● 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.

● Note
If you want to install an ASCS instance with integrated SAP Web Dispatcher [page 29] or with integrated SAP Gateway [page 31] or both, you must choose the Custom parameter mode.

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

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

```
-datacodepage <datacodepage_of_source_system>
```

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

For more information, see the system copy guides at http://support.sap.com/sltoolset System Provisioning System Copy Option Guide for Systems Based on SAP NetWeaver 7.1 & Higher

⚠️ Caution

The signature of 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.

Keep in mind that this automatic check is only committed once and **not** repeated if you modify artefacts 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 signature is not checked again.

See also the description of this new security feature in SAP Note 2393060.

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

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

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

---

**Caution**

**HP-UX only:** If you decided to use 02 as the instance number, the instance fails to start during the installation process. For more information about the cause, see SAP System Parameters [page 53]. You have to manually change the port number for report RSLGCOLL to continue with the installation.

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

---

9. If required, delete directories with the name `sapinst_exe.xxxxxx.xxxx` after the installer 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 media or a USB drive separate from your installation hosts. This might be useful for analyzing issues occurring later when you use the system. For security reasons, do not keep installation directories on installation hosts, but make sure that you delete them after saving them separately.

10. For security reasons, we recommend that you delete the .sapinst directory within the home directory of the user with which you ran the installer:
   
   `<User_Home>/sapinst/`

11. If you copied the installer software to your hard disk, you can delete these files when the installation has successfully completed.

12. For security reasons, we recommend that you remove the operating system users from the group sapinst after you have completed the installation.

   **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 installer has completed.

5.7 Additional Information About the Installer

The following sections provide additional information about the installer.

- **Useful Information About the Installer** [page 120]
  
  This section contains some useful technical background information about the installer and the installer GUI.

- **Interrupted Processing of the Installer** [page 121]
  
  Here you find information about how to restart the installer if its processing has been interrupted.

- **Entries in the Services File Created by the Installer** [page 124]

- **Troubleshooting with the Installer** [page 125]
  
  This section tells you how to proceed when errors occur while the installer is running.

- **Using the Step State Editor (SAP Support Experts Only)** [page 126]
  
  This section describes how to use the Step State Editor available in the installer.
5.7.1 Useful Information About the Installer

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

- Software Provisioning Manager (the “installer” for short) has the web browser-based “SL Common GUI of the Software Provisioning Manager” - “SL Common GUI” for short.
  The SL Common GUI 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 footprint, since only a web browser is required on the client
  ○ New controls and functionality, for example, view logs in web browser.
  The SL Common GUI 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 Common GUI the installer provides a pre-generated URL at the bottom of the shell from which you are running the installer. If you have a supported web browser installed on the host where you run the installer, you can start the SL Common GUI directly from this URL. Otherwise, open a web browser supported by the SL Common GUI on any device and run the URL from there.
  For more information about supported web browsers see Prerequisites for Running the Installer [page 111].
  If you need to run the SL Common GUI in accessibility mode, apply the standard accessibility functions of your web browser.

- As soon as you have started the sapinst executable, the installer 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 installer.
  After you have reached the Welcome screen and selected the relevant installer option for the SAP system or instance to be installed, the installer creates a directory sapinst_instdir where it keeps its log files, and which is located directly below the temporary directory. The installer finds the temporary directory by checking the value of the TEMP, TMP, or TMPDIR environment variable. If no value is set for these variables, the installer uses /tmp 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 installer.

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

**Caution**

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

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

- The installer extracts itself to the temporary directory. These executables are deleted again after the installer has stopped running. Directories called `sapinst_exe.xxxxxx.xxxx` sometimes remain in the temporary directory after the installer 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 installer, which might be useful if an error occurs.

**Caution**

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

- To see a list of all available installer properties, start the installer as described above with the option `-p`:
  ```shell```
  ./sapinst -p
  ```

- If you want to perform an installation in unattended mode, see SAP Note [2230669](https://support.sap.com), which describes an improved procedure using `inifile.params`.

- If required, stop the installer by choosing the **Cancel** button.

**Note**

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

---

**5.7.2 Interrupted Processing of the Installer**

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

**Context**

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

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

- You interrupted the processing of the installer by choosing **Cancel** in the SL Common GUI.

**Caution**

If you stop an option in the **Execute** phase, any system or component **installed** by this option is incomplete and not ready to be used. Any system or component **uninstalled** by this option is not completely uninstalled.
The following table describes the options in the dialog box:

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

**Note**

You can also terminate the installer 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**

1. Log on to the installation host as a user with the required permissions as described in Running the Installer [page 114].
2. Make sure that the installation media are still available.

   For more information, see Preparing the Installation Media [page 91].

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

For more information, see Preparing the Installation Media [page 91].

**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.

4. Restart the installer from the directory to which you unpacked the Software Provisioning Manager archive by executing the following command:

<Path_To_Unpack_Directory>/sapinst

5. The installer is restarting.

The installer now starts and waits for the connection with the SL Common GUI.

You can find the URL you require to access the SL Common GUI at the bottom of the shell from which you are running the installer.

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

If you have a supported web browser (see Prerequisites for Running the Installer [page 111]) installed on the host where you run the installer, you can open this URL directly in the shell. Otherwise open the URL in a supported web browser that runs on another device.

The SL Common GUI opens in the browser by displaying the Welcome screen.

**Note**

Before you reach the Welcome screen, your browser might warn you that the certificate of the sapinst process on this computer could not be verified. Accept this warning to inform your browser that it can trust this site, even if the certificate could not be verified.

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*:

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perform a new run</strong></td>
<td>The installer does not continue the interrupted installation option. Instead, it moves the content of the old installer directory and all installer-specific files to a backup directory. Afterwards, you can no longer continue the old option.</td>
</tr>
<tr>
<td></td>
<td>The following naming convention is used for the backup directory: <strong>log_</strong>&lt;Day&gt;&lt;Month&gt;&lt;Year&gt;&lt;Hours&gt;&lt;Minutes&gt;&lt;Seconds&gt;**</td>
</tr>
<tr>
<td></td>
<td><strong>Example</strong></td>
</tr>
<tr>
<td></td>
<td><em>log_01_Oct_2016_13_47_56</em></td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>All actions taken by the installation before you stopped it (such as creating directories or users) are not revoked.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Caution</strong></th>
<th>The installer moves all the files and folders to a new log directory, even if these files and folders are owned by other users. If there are any processes currently running on these files and folders, they might no longer function properly.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continue with the existing one</strong></td>
<td>The installer continues the interrupted installation from the point of failure.</td>
</tr>
</tbody>
</table>

### 5.7.3 Entries in the Services File Created by the Installer

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

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

5.7.4 Troubleshooting with the Installer

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

Context

If an error occurs, the installer:
- Stops processing
- Displays a dialog informing you about the error

Procedure

1. Check SAP Note 1548438 for known installer issues.
2. If an error occurs during the Define Parameters or the Execute Service phase, do one of the following:
   o Try to solve the problem:
     o To check the installer log files (`sapinst.log` and `sapinst_dev.log`) for errors, choose the LOG FILES tab.

Note

The LOG FILES tab is only available if you have selected on the Welcome screen the relevant installer 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 which you used to start the installer.

For more information, see Useful Information About the Installer [page 120].
To check the log and trace files of the installer GUI for errors, go to the directory 
<User_Home>/sapinst/
Then continue by choosing Retry.
If required, abort the installer by choosing Cancel in the tool menu and restart the installer. For more information, see Interrupted Processing of the Installer [page 121].

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.

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

This section describes how to use the Step State Editor available in the installer.

**Note**

Only use the Step State Editor if 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 installer meets the requirements listed in Prerequisites for Running the Installer [page 111].

**Procedure**

1. Start the installer from the command line as described in Running the Installer [page 114] with the additional command line parameter SAPINST_SET_STEPSTATE=true
2. Follow the instructions on the installer 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 installer during the Execute Service phase. By default all steps are in an initial state. Underneath each step, you see the assigned installer 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 installer to pause.
- Mark the checkbox in front of the Skip option of the steps which you want the installer 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 installer 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 installer.

5. Continue until you have run through all the steps of the **Execute Service** phase of the installer.
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

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

**Note**

SAP systems based on SAP NetWeaver 7.4 and higher only:

You can skip some of these post-installation steps if you have already completed them as a step in task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction STC01) immediately after the installation was completed. For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 131].

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

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

**Note**

We highly recommend that you apply the latest Support Package as described in Applying the Latest Kernel [page 142]. The minimum requirement for running SAP BW on the SAP HANA database is SP4.

**Standard, Distributed, or High-Availability System**

**Note**

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

The SAP HANA database is normally pre-installed by SAP partners before you start the installation. During the SAP system installation, the database instance was remotely installed by Software Provisioning Manager (the “installer”) from the primary application server host.

However, on Linux you can install SAP systems based on SAP NetWeaver 7.4 or higher on the same host as the SAP HANA database - that is as a standard system [page 22] - without applying additional environment settings. For more information, see SAP Note 1953429.

1. You check and if necessary modify the settings for the operating system users for your SAP system if they were created by the installer.
For more information, see Creating Operating System Users and Groups [page 74].

2. You check whether you can log on to the Application Server ABAP [page 130].

3. **SAP systems based on SAP NetWeaver 7.4 and higher only:** You perform the automated initial setup [page 131].

   **Note**
   This step is optional.

4. If you have not enabled SAP EarlyWatch Alert in your SAP Solution Manager, you enable SAP EarlyWatch Alert for ABAP Systems on SAP HANA [page 133].

5. You install the SAP license [page 134].

6. If you have installed a high-availability system, you set up the licenses for high availability [page 135].

7. You configure the remote connection to SAP support [page 136].

8. You install the SAP online documentation [page 137].

9. You perform the consistency check [page 137].

10. You configure the Transport Management System [page 139].

11. For production systems it is highly recommended that you connect the system to SAP Solution Manager [page 141].

12. You apply the latest kernel and Support Packages [page 142].

13. You perform post-installation steps for the application server ABAP [page 144].

14. If you installed the ABAP part of an SAP Solution Manager 7.2 or SAP Process Integration 7.5 system, enable HTTPS communication with the Java part of the system.
   For more information, see SAP Solution Manager 7.2, SAP Process Integration 7.5 only: Enabling HTTPS Communication for ABAP [page 146].

15. If required, you install additional languages and perform language transport [page 147].

16. **SAP Kernel Release 7.4 and Higher:** You perform IP Multicast Configuration [page 148].

17. You configure the Process Integration system after installation [page 149].

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

18. You configure the user management [page 150].

19. You ensure user security [page 150].

20. You perform the client copy [page 154].

21. You install or upgrade SAP HANA studio [page 155].

22. You back up the SAP HANA database [page 155].

23. **SAP systems based on SAP NetWeaver 7.4 and higher only:** If required, you change the keys for the secure storage [page 156].

24. You perform a full installation backup [page 157].

25. If you chose to install an integrated SAP Web Dispatcher within the ASCS instance, you log on to the SAP Web Dispatcher Management Console [page 159].

26. If you chose to install an integrated SAP Web Dispatcher within the ASCS instance, you configure the SAP Web Dispatcher [page 160].

27. If you chose to install an integrated Gateway within the ASCS instance, you configure the SAP Gateway [page 161].
28. You check the Master Guide for your SAP Business Suite application or SAP NetWeaver application (chapter Configuration of Systems and Follow-Up Activities) for further implementation and configuration steps, such as language installation, monitoring, work processes, transports, SAP license, printers, system logs, and connectivity to system landscape directory (SLD).

Additional Application Server Instance

1. You check and if necessary modify the settings for the operating system users for your SAP system if they were created by the installer.
   For more information, see Creating Operating System Users and Groups [page 74].
2. You check whether you can log on to the Application Server ABAP [page 130].
3. You install the SAP online documentation [page 137].
4. You ensure user security [page 150].
5. You perform a full installation backup [page 157].

6.2 Logging On to the Application Server ABAP

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

Prerequisites

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

Context

Note

Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5 or higher. For more information, see SAP Note 1749142.

Note

Client 001 is no longer available in newly installed SAP systems based on SAP S/4HANA and SAP BW/4HANA.
You access the application server ABAP using **SAP Logon**.

**Procedure**

1. Start **SAP Logon** on the host where you have installed the SAP front-end software as follows:
   - **SAP GUI for Windows:**
     On the host where you have installed the front end, choose:
     - Start ➤ Programs ➤ SAP Front End<Release> ➤ SAPlogon
   - **SAP GUI for Java:**
     Enter the following command from the GUI installation directory:
     - `guilogon`

2. Create a logon entry for the newly installed system in the **SAP Logon**.
   For more information about creating new logon entries, press `F1`.

3. When you have created the entry, log on as user **SAP** or **DDIC**.

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

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

**Prerequisites**

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

- If you have run the installation using a stack configuration file (also called “up-to-date installation”), we recommend that you proceed as follows:
  1. Perform the complete installation and update process - that is the installation with Software Provisioning Manager and the update with Software Update Manager.
  2. Perform the automated initial setup. By running first the update and then the automated initial setup, you can profit from latest features and fixes in the initial setup configuration content.
Background: As of Software Logistics Toolset 1.0 SPS12, the installation procedure with Software Provisioning Manager 1.0 SP07 and higher also includes basic configuration activities, such as initial basic configuration of transport management, which are a prerequisite for the subsequent maintenance process. In previous SP versions of Software Logistics Toolset 1.0, this prerequisite had to be fulfilled by running automated initial setup before the update process.

- If you have not run the installation using a stack configuration file (also called “up-to-date installation”), we recommend that you proceed as follows:
  1. Run automated initial setup directly after the installation, using the automation content provided with the system load.
  2. Apply the Support Packages to benefit from the already performed initial configuration – for example, using the already configured Transport Management System.
  3. Consider running the automated initial setup a second time, especially if you want to benefit from the latest improvements and fixes offered by the updated automation content provided by the applied Support Package.

For more information about automated initial setup, see the SAP Community Network at https://wiki.scn.sap.com/wiki/display/SL/Automated+Initial+Setup+of+ABAP-Based+Systems.

Procedure

1. Start the ABAP Task Manager by calling transaction STC01.
2. Choose task list SAP_BASIS_SETUP_INITIAL_CONFIG.
3. Select the tasks you want to get executed.
   - For this, the task list offers sophisticated online documentation of the comprised activities.
4. Choose Execute.
   - You are guided through the configuration steps where you can enter the required values.

Related Information

Installation Using a Stack Configuration File [page 36]
Installing the SAP License [page 134]
Configuring the Remote Connection to SAP Support [page 136]
Configuring the Change and Transport System [page 139]
Applying the Latest Kernel and Support Package Stacks [page 142]
Performing Post-Installation Steps for the ABAP Application Server [page 144]
Performing the Consistency Check [page 137]
6.4 Enabling SAP EarlyWatch Alert for ABAP Systems on SAP HANA

Context

After the installation of any new SAP ABAP system running on SAP HANA, you have to enable the SAP EarlyWatch Alert (EWA) and send corresponding data to SAP – either by using SAP Solution Manager for SAP EarlyWatch Alert or by performing the automated configuration described below.

The SAP EarlyWatch Alert identifies potential problems early, avoids bottlenecks, and monitors the performance of your ABAP and Java systems and your most important business processes regularly, automatically, and effectively. For more information, see [http://support.sap.com/ewa](http://support.sap.com/ewa).

If you have not enabled SAP EarlyWatch Alert in your SAP Solution Manager (for more information, see SAP Note [1257308](http://support.sap.com/ewa)), we provide an automated procedure using our automation framework ABAP Task Manager, which is already part of the ABAP system. The automation task list “Early Watch Alert to SAP Configuration” sets up a periodical EWA data collection and transfers this data to SAP in Service Data Control Center (SDCCN), when executed by the ABAP Task Manager.

The task list comprises the following detailed tasks:

1. Configuration of SAPOSS Connection (OSS1)
   Creates standard RFC SAPOSS if it does not yet exist.
2. SDCC_OSS Connection
   Creates an RFC SDCC_OSS by copying RFC SAPOSS and adds this RFC to the SDCCN RFC list if it does not yet exist. This RFC is used in SDCCN to communicate with the SAP backend.
3. SDCCN Activation
   Activates the SDCCN in the system if not yet activated. An hourly job /BDL/TASK_PROCESSOR is scheduled after the activation.
4. SDCCN Refresh Service Definition
   Gets the newest Service Definitions from SAP. The Service Definitions define the data to be collected for the EWA session.
5. SDCCN Schedule EWA to SAP
   Schedules a weekly EWA session (with session number 000Z*) in SDCCN, if no session exists.

Procedure

1. Download the archive ST-PI 740 or higher at:
   [http://support.sap.com/installations](http://support.sap.com/installations)
   Software Downloads ➤ Support Packages and Patches ➤ By Alphabetical Index (A-Z) ➤ S ➤ ST-PI ➤ ST-PI 740 ➤ SUPPORT PACKAGES.
2. Apply the downloaded ST-PI archive via SPAM/SAINT.
3. Start the ABAP Task Manager by calling transaction STC01.
4. Choose the task list /BDL/SDCCN_EWA_CONFIG.
5. Choose **Execute**.
   You are guided through the configuration steps.

### 6.5 Installing the SAP License

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

**Note**

SAP systems based on SAP NetWeaver 7.4 or higher only:

You can skip this task if you have already completed it as a step in task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation was completed. For more information, see [SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional)](page 131).

**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](http://support.sap.com/licensekey).

**Procedure**

Install the SAP license as described in the SAP Library at:
### 6.6 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 ABAP central services instance (ASCS instance) runs.

To be able to perform a switchover, the temporary license that is installed automatically with the ASCS instance is not sufficient. You first need to install a permanent license, which is determined by the hardware environment of the message server. Since SAP’s high-availability (HA) solution stipulates two or more cluster nodes (host machines) where the message server is enabled to run, you have to order as many license keys [page 134] 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.

---

**SAP Release and SAP Library Quick Link**

- **SAP NetWeaver 7.3**
- **SAP NetWeaver 7.3 including Enhancement Package 1**
- **SAP NetWeaver 7.4**
- **SAP NetWeaver 7.5**
- **SAP NetWeaver Application Server for ABAP 7.51 innovation package**
  - [https://help.sap.com/nw751abap](https://help.sap.com/nw751abap)
- **SAP NetWeaver AS for ABAP 7.52**
  - [https://help.sap.com/nw752abap](https://help.sap.com/nw752abap)

**SAP Library Path (Continued)**

- **Application Help**
- **Function-Oriented View: English**
- **Solution Life Cycle Management**
- **SAP Licenses**
Procedure

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

Results

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

6.7 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.

### Note

SAP systems based on SAP NetWeaver 7.4 or higher only:

You can skip this task if you have already completed it as a step in task list SAP BASIS SETUP INITIAL CONFIG when running the ABAP task manager for lifecycle management automation (transaction STC01) immediately after the installation was completed. For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 131].

For more information, see SAP Support Portal at https://support.sap.com/remote-support.html.
6.8 Installing SAP Online Documentation

You can install SAP online documentation as application help.

Context

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

Procedure

Install the application help in your SAP system as described in the README.TXT file contained in the root directory of the application help media.

Online documentation media are delivered as part of the installation package. You can also download them from https://launchpad.support.sap.com/#/softwarecenter/SAP_NETWEAVER_AND_COMPLEMENTARY_PRODUCTS/SAP_NETWEAVER/SAP_NETWEAVER_7.5/APPLICATION_HELP (SAP LIBRARY).

6.9 Performing the Consistency Check

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

Note

**SAP systems based on SAP NetWeaver 7.4 or higher only:**

You can skip this task if you have already completed it as a step in task list SAP_BASIS_SETUP_INITIAL_CONFIG when running the ABAP task manager for lifecycle management automation (transaction STC01) immediately after the installation was completed. For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 131].
Prerequisites

- If the installation finished successfully, your SAP system should be up and running. Otherwise, start it as described in Starting and Stopping SAP System Instances [page 180].
- You have logged on to the SAP system [page 130].

Context

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

The following checks are performed:

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

Procedure

1. Perform a system check:
   - Call transaction SICK.
   - You should see the entry SAP System Check | no errors reported

2. Perform a database check:
   - In the DBA Cockpit (transaction DBACOCKPIT), check for missing tables or indexes by choosing Diagnostics > Missing Tables and Indexes. 

6.10 Configuring the Change and Transport System

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

**Note**

You can skip this task if one of the following is true:

- **Only valid for SAP systems based on SAP NetWeaver 7.4 and higher**: You already completed these steps as part of task list `SAP_BASIS_SETUP_INITIAL_CONFIG` have to perform these steps or at least some of these steps when running the ABAP task manager for lifecycle management automation (transaction STC01) immediately after the installation had completed.
  
  Note that `SAP_BASIS_SETUP_INITIAL_CONFIG` only covers the configuration of TMS as single system.

- You are using a stack configuration file (see [Installation Using a Stack Configuration File (Optional) [page 36]]) and chose *Run TMS Configuration (for Single System)* during the installation.

**Context**

**Procedure**

1. Call transaction `STMS` in the ABAP system to configure the domain controller in the Transport Management System (TMS).
For more information, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3</td>
<td><img src="http://help.sap.com/nw73" alt="Application Help" /></td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td><img src="http://help.sap.com/nw73" alt="Solution Life Cycle Management" /></td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td><img src="http://help.sap.com/nw73" alt="Change and Transport System" /></td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td><img src="http://help.sap.com/nw73" alt="Basics of the Change and Transport System" /></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td><img src="http://help.sap.com/nw73" alt="Requirements for Working with the Transport Organizer" /></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td><img src="http://help.sap.com/nw73" alt="Setting the System Change Option" /></td>
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<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
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</table>

2. In addition, you must configure the system change options. For more information, see the SAP Library at:

<table>
<thead>
<tr>
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<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
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</tbody>
</table>

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

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

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 7.1:
     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
   ○ 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\Registering 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. 

   For more information, see the Planning Guide - System Landscape Directory in the SAP Community Network at System Landscape Directory (SLD) - Overview.

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 7.1:
  [Link to SAP Solution Manager Operations > Managing System Landscape Information > Setting Up the Landscape Management Infrastructure > Connecting LMDB to System Landscape Directory (SLD)]

- If your SAP Solution Manager release is 7.2:
  [Link to Technical Infrastructures > Landscape Management Database (LMDB) > 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 7.1:

- If your SAP Solution Manager release is 7.2:
  [Link to Technical Infrastructures > Landscape Management Database (LMDB) > Managing Technical System Information]

Next Steps

For more information, see the following pages in the SAP Community Network:

- System Landscape Directory (SLD) - Overview
- Documentation for Landscape Management Database - LMDB

6.12 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.

**Note**

If you are using a stack configuration file (see Installation Using a Stack Configuration File (Optional) [page 36]), you already downloaded the stack.xml file and the delta archives using the Maintenance Optimizer in your SAP Solution Manager. If you then already called the Software Update Manager (SUM) from the installer and applied the Support Package Stacks after the installation had finished, you can skip this section.
Context

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

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

- 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):

```bash
su - root

cd <Kernel_Directory>

./saproot.sh <SAPSID>

exit
```
6.13 Performing Post-Installation Steps for the ABAP Application Server

This section describes the post-installation steps you have to perform for the ABAP application server.

**Note**

**SAP systems based on SAP NetWeaver 7.4 or higher only:**

You can skip this task if you have already completed it as a step in task list `SAP_BASIS_SETUP_INITIAL_CONFIG` when running the ABAP task manager for lifecycle management automation (transaction `STC01`) immediately after the installation was completed. For more information, see *SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional)* [page 131].

**Prerequisites**

You have logged on to the ABAP application server as described in *Logging On to the Application Server* [page 130].

**Context**

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

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

For more information, see the appropriate sections below.

**Procedure**

- **Upload and Set System Profiles using Transaction RZ10**

  You upload system profiles, such as default profile and instance profile, from the file system into the database of the target system using transaction `RZ10`. 
For more information about how to maintain SAP system profiles, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ SAP NetWeaver 7.3</td>
<td>Application Help Function-Oriented View: English</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></td>
<td>Application Server Application Server ABAP</td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Administration of Application Server ABAP Monitoring and Administration Tools for Application Server ABAP</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
<td>Configuration in the CCMS Profiles Maintaining Profiles / Profile Maintenance</td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>○ SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td></td>
</tr>
<tr>
<td>○ SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

- **Create Logon and RFC Server Groups using Transactions SMLG and RZ12**
  
  You create the following:
  
  ○ Logon groups using transaction SMLG
  ○ RFC server groups using transaction RZ12

  Specify the following:
  
  ○ Name of the logon or RFC server group
  ○ Instance name (application server)
  ○ Group type attributes are optional

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

- **Create Operation Modes using Transaction RZ04**
  
  You check for existing operation modes and - if required - create a new operation mode using transaction RZ04.

  Specify the following:
  
  ○ Name of the operation mode
  ○ Short description
  ○ Optional: monitoring properties variant

  Select the corresponding checkbox to assign the operation mode to the following:
  
  ○ Time table (assignment only from 0-24 h)
  ○ Current application server instance

- **Schedule Standard Jobs using Transaction SM36**
  
  You schedule SAP standard jobs using transaction SM36.

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

- **Configure the SLD Data Supplier using Transaction RZ70**
a. Make sure that the SLD and the SLD bridge (the receiving thread of the SLD, which runs on a Java EE engine) are running.
b. Configure the System Landscape Directory (SLD) data supplier with default settings, using transaction RZ70.

SLD configuration is a prerequisite for the connection of an SAP system to SAP Solution Manager.

For more information, see Connecting the System to SAP Solution Manager [page 141]

- Perform Load Generation using Transaction SGEN

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

Choose one of the following generation modes:

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

  **Note**

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

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

6.14 SAP Solution Manager 7.2, SAP Process Integration 7.5 only: Enabling HTTPS Communication for ABAP

For secure communication between the SAP systems connected to the ABAP stack, further post-installation steps are required to fully enable HTTPS communication.

**Prerequisites**

- You have installed the application server ABAP for an SAP Solution Manager 7.2 or SAP Process Integration 7.5.
- You entered the HTTPS port that is to be configured in the application server instance profile when processing the Communication Port for ABAP screen. For more information, see Additional Parameters when Installing SAP Process Integration 7.5 or SAP Solution Manager 7.2.
Procedure

Proceed as described in the SAP Notes 1527879 and 510007.

Related Information

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

6.15 Installing Additional Languages and Performing Language Transport

This section describes how to install and transport additional languages.

Note

You do not have to perform these steps or at least some of these steps if you are using a stack configuration file (see Installation Using a Stack Configuration File (Optional) [page 36]) and processed the Install Additional Languages screen during the installation.

Context

If you have problems during the language installation, see SAP Note 2456868.

Procedure

1. Configure the language settings by using transaction I18N and choosing I18N Customizing I18N System Configuration or by executing report RSCFINST directly.

   For more information, see SAP Note 42305.

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

2. Perform the language transport using transaction SMLT:

   Note

   German is already available in the system. Do not transport it via SMLT.
a. Classify the language.
b. Schedule the language transport.
c. Schedule the language supplementation.

Next Steps

Note

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

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

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

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>● SAP NetWeaver 7.3</td>
<td><img src="http://help.sap.com/nw73" alt="Application Help" /></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td><img src="http://help.sap.com/nw73" alt="Solution Life Cycle Management" /></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.4</td>
<td><img src="http://help.sap.com/nw73" alt="Change and Transport System" /></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td>![Language Transport (BC-CTS-LAN)]</td>
</tr>
<tr>
<td>● SAP NetWeaver 7.5</td>
<td><img src="http://help.sap.com/nw75" alt="Application Help" /></td>
</tr>
<tr>
<td>● SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td><img src="http://help.sap.com/nw751abap" alt="Solution Life Cycle Management" /></td>
</tr>
<tr>
<td>● SAP NetWeaver AS for ABAP 7.52</td>
<td><img src="http://help.sap.com/nw752abap" alt="Change and Transport System" /></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td>![Language Transport (BC-CTS-LAN)]</td>
</tr>
</tbody>
</table>

6.16 SAP Kernel 7.40 and Higher: IP Multicast Configuration and Wake-Up Mechanism

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

Since SAP kernel release 7.40 Patch Level (PL) 46 and 7.41 PL 13, the dispatcher checks during startup whether local IP multicast communication is working properly. You have to adjust the network configuration of AS ABAP as described in SAP Note 1931675.
Since SAP kernel 7.41 PL 47 and 7.42 PL 14, a new event-based wake-up mechanism is available that replaces the multicast mechanism. SAP recommends using this new mechanism in case of problems with multicast. For details on activating the new mechanism see SAP Note 2050408 to ensure that local IP multicast communication works properly.

6.17 PI 7.5 Only: 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.

Prerequisites

If you have installed an SAP PI 7.5 system and you intend to run automated configuration using the Central Technical Configuration (CTC) Wizard after the installation, make sure that the ABAP communication port is either completely configured for HTTPS or optionally for HTTP, for example by configuring the ABAP communication port during the installation process (see the Ports table in section SAP System Parameters [page 53]). You can only run the CTC Wizard if the ABAP communication port is configured.

Procedure

To configure your SAP PI 7.5 system, execute the “SAP NetWeaver initial setup” CTC Wizard described in SAP Note 1309239.

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:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.5</td>
<td>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)</td>
</tr>
</tbody>
</table>
6.18 Configuring the User Management

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

Procedure

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

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

For more information, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ SAP NetWeaver 7.3</td>
<td>Application Help Function-Oriented View: English Security Identity Management Identity Management for System Landscapes Integration of User Management in Your System Landscape Adding an ABAP System to Your System Landscape</td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td><a href="https://help.sap.com/nw73/">https://help.sap.com/nw73/</a></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.4</td>
<td><a href="https://help.sap.com/nw74/">https://help.sap.com/nw74/</a></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.5</td>
<td><a href="https://help.sap.com/nw75">https://help.sap.com/nw75</a></td>
</tr>
<tr>
<td>○ SAP NetWeaver AS for ABAP 7.52</td>
<td><a href="https://help.sap.com/nw752abap/">https://help.sap.com/nw752abap/</a></td>
</tr>
</tbody>
</table>

6.19 Ensuring User Security

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

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

- Operating system users
- SAP system users

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

<table>
<thead>
<tr>
<th>User Type</th>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system user</td>
<td>&lt;sapsid&gt;adm</td>
<td>SAP system administrator</td>
</tr>
<tr>
<td>SAP HANA database user</td>
<td>SAP&lt;SAPSID&gt;</td>
<td>SAP HANA database owner</td>
</tr>
</tbody>
</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 installer had completed. For more information, see Operating System Users in SAP System Parameters [page 53].
SAP Host Agent User

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

SAP System Users

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

**Note**

Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5 or higher. For more information, see SAP Note 1749142.

**Note**

Client 001 is no longer available in newly installed SAP systems based on SAP S/4HANA and SAP BW/4HANA.

<table>
<thead>
<tr>
<th>User</th>
<th>User Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP system user</td>
<td>SAP*</td>
<td>User exists in at least SAP system clients 000, 001, and 066.</td>
</tr>
<tr>
<td></td>
<td>DDIC</td>
<td>User exists in at least SAP system clients 000 and 001.</td>
</tr>
<tr>
<td></td>
<td>EARLYWATCH</td>
<td>User exists in at least SAP system client 066.</td>
</tr>
<tr>
<td>User</td>
<td>User Name</td>
<td>Comment</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Application Server Java Admin­istrator</td>
<td>The name that you gave this user during the installation or the default name <code>J2EE_ADMIN</code> (see SAP System Parameters [page 53])</td>
<td>This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It has administrative permissions for user management. The password of this user is stored in secure storage. Therefore, whenever you change the password of the administrator password, you must also change the password in secure storage. <strong>Recommendation</strong> We recommend that you use strong password and auditing policies for this user.</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note</td>
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<tr>
<td>Note</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Server Java Guest</td>
<td>The name that you gave this user during the installation or the default name <code>J2EE_GUEST</code> (see SAP System Parameters [page 53])</td>
<td>This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It is used for anonymous access.</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication user for Appli­cation Server Java</td>
<td>The name that you gave this user during the installation or the default name <code>SAPJSF</code> (see SAP System Parameters [page 53])</td>
<td>This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It is used for a remote function call (RFC) between the ABAP system and the Java system.</td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.20 Performing the Client Copy

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

Context

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

Note

Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5 or higher. For more information, see SAP Note 1749142.

Note

Client 001 is no longer available in newly installed SAP systems based on SAP S/4HANA and SAP BW/4HANA.

Use client 000 as source client for the client copy.

Note

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

Procedure

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

Next Steps

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

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
</table>
| • SAP NetWeaver 7.3  
  http://help.sap.com/nw73 |
| • SAP NetWeaver 7.3 including Enhancement Package 1  
  http://help.sap.com/nw731 |
| • SAP NetWeaver 7.4  
  http://help.sap.com/nw74 |
| • SAP NetWeaver 7.5  
  http://help.sap.com/nw75 |
| • SAP NetWeaver Application Server for ABAP 7.51 innovation package  
  https://help.sap.com/nw751abap |
| • SAP NetWeaver AS for ABAP 7.52  
  https://help.sap.com/nw752abap |

6.21 Installation or Upgrade of SAP HANA Studio

Here you find documentation about how to install or upgrade the SAP HANA Studio.

To install or upgrade SAP HANA studio, see the documentation SAP HANA Studio Installation and Update Guide at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM ➤ Installation and Upgrade ➤.

6.22 Backing Up the SAP HANA Database

Here you find documentation about how to back up the SAP HANA database.

Back up the SAP HANA database as described in section Backing Up and Recovering the SAP HANA Database of the SAP HANA Administration Guide, which you can find here:

6.23 SAP Systems Based on SAP NetWeaver 7.4 and Higher: Changing Keys for the Secure Storage

The secure storage in the file system and the secure storage in the database have been encrypted with a randomly generated individual encryption key or with a default key.

In the first case, you have made a backup of the individual key because you need this value in case of failure to recover the data.

No matter what you chose during installation, you can change the encryption key at any time using the respective maintenance tool.

**Recommendation**

SAP recommends using an individual encryption key.

- For the secure storage in the file system, the key change is described in the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.5 <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52 <a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

- For the secure storage in the database, the key change is described in the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.5 <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52 <a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>
6.24 Performing a Full Installation Backup

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

⚠️ Caution

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

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.

ℹ️ 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 180].

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:
     $\text{tar } -cf - <\text{file\_system}> | \text{compress } -c > <\text{tape\_device}>
   - Saving to the file system:
     $\text{tar } -cf - <\text{file\_system}> | \text{compress } -c > \text{ARCHIVENAME.tar.Z}$

   **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:
   $\text{tar } -czf <\text{ARCHIVENAME}.tgz <\text{file\_system}>$

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:
     $\text{cat } <\text{tape\_device}> | \text{compress } -cd | \text{tar } -xf -$
   - From the file system:
     $\text{cat } \text{ARCHIVENAME.tar.Z } | \text{compress } -cd | \text{tar } -xf -$

Only valid for 'Platform': Linux

**Note**
**Linux only:** If you want to restore the data from a **GNU tar** archive, you have to execute the following command:
$\text{tar } -xzf <\text{ARCHIVENAME}.tgz$

End of 'Platform': Linux
6.25 Logging on to the SAP Web Dispatcher Management Console

This section describes how to log on to the SAP Web Dispatcher.

Context

Note

This step is only required if you chose to install an integrated SAP Web Dispatcher instance within the ASCS instance.

You must log on to the SAP Web Dispatcher Management Console to do the following:

- Check whether the SAP Web Dispatcher was installed successfully,
- Change the password of the webadm user,
- Access monitoring and administration tools.

Procedure

1. Open a web browser.
2. Enter the following URL, depending on whether you use HTTP or HTTPS:
   - `http(s)://<Webdispatcher_Host>:<HTTP(S)_PORT>/sap/wdisp/admin/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.
4. We recommend that you change the password of `webadm` immediately after the installation for security reasons.
For more information on how to change passwords of existing users using the **Admin Handler**, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quicklink</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ SAP NetWeaver 7.3</td>
<td>Application Help ➔ Function-Oriented View ➔ Application Server ➔ Application Server Infrastructure ➔ Components of SAP NetWeaver Application Server ➔ SAP Web Dispatcher ➔ Administration of the SAP Web Dispatcher ➔ Area menu ➔ Section “HTTP Handler”</td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td><a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
</tr>
<tr>
<td></td>
<td><a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.4</td>
<td>Application Help ➔ Function-Oriented View ➔ Application Server ➔ Application Server Infrastructure ➔ Components of SAP NetWeaver Application Server ➔ SAP Web Dispatcher ➔ Administration of the SAP Web Dispatcher ➔ Area menu ➔ Section “HTTP Handler”</td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.5</td>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
</tr>
<tr>
<td>○ SAP NetWeaver AS for ABAP 7.52</td>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
</tr>
</tbody>
</table>

**Related Information**

ASCS Instance with Integrated SAP Web Dispatcher [page 29]

**6.26 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 integrated SAP Web Dispatcher instance within the ASCS instance.

You can find the configuration information in the SAP Library at:
**Related Information**

ASCS Instance with Integrated SAP Web Dispatcher [page 29]

### 6.27 Gateway Configuration (Optional)

You have to configure the gateway to be able to use it.

**Note**

This step is only relevant if you installed a gateway integrated in the ASCS instance. For more information, see ASCS Instance with Integrated Gateway [page 31].

You can find all relevant configuration information in the gateway documentation in the SAP Library at:
<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quicklink</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td>Application Help ➤ SAP NetWeaver Library: Function-Oriented View ➤ Application Server ➤ Application Server Infrastructure ➤ Components of SAP NetWeaver Application Server ➤ Gateway</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

**Related Information**

ASCS Instance with Integrated Gateway [page 31]
7 Additional Information

The following sections provide additional information about optional preparation, installation, and post-installation tasks.

There is also a section describing how to delete an SAP system.

7.1 Integration of LDAP Directory Services

This section explains the benefits of using the SAP system with the Lightweight Directory Access Protocol (LDAP) directory and gives an overview of the configuration steps required to use an SAP system with the directory.

LDAP defines a standard protocol for accessing directory services, which is supported by various directory products such as Microsoft Active Directory, and OpenLDAP slapd. Using directory services enables important information in a corporate network to be stored centrally on a server. The advantage of storing information centrally for the entire network is that you only have to maintain data once, which avoids redundancy and inconsistency.

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

Note

The SAP system can interact with the Active Directory using the LDAP protocol, which defines:

- The communication protocol between the SAP system and the directory
- How data in the directory is structured, accessed, or modified

If a directory other than the Active Directory also supports the LDAP protocol, the SAP system can take advantage of the information stored there. For example, if there is an LDAP directory on a UNIX or Windows server, you can configure the SAP system to use the information available there. In the following text, directories other than the Active Directory that implement the LDAP protocol are called generic LDAP directories.
This section does **not** provide information about the use of LDAP directories with the LDAP Connector. For more information about using and configuring the LDAP Connector for an ABAP system, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver Mobile 7.1</td>
<td>➤ Application Help ➤ Function-Oriented View ➤ Security ➤ Identity Management ➤ Identity Management of the Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver Mobile 7.1 including Enhancement Package 1</td>
<td>See the SAP NetWeaver Mobile Library.</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0</td>
<td>➤ Note</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.1 including Enhancement Package 1 for Banking Services from SAP 5.0 and 6.0</td>
<td>Since the SAP NetWeaver Mobile 7.1 Library is the only available SAP Library for ABAP systems based on SAP NetWeaver 7.1, in this guide we always refer to it also for SAP NetWeaver 7.1 for Banking Services from SAP 5.0 and 6.0.</td>
</tr>
<tr>
<td>• SAP NetWeaver Process Integration 7.1</td>
<td>➤ Application Help ➤ Function-Oriented View ➤ Security ➤ Identity Management ➤ Identity Management of the Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver Process Integration 7.1 Including Enhancement Package 1</td>
<td>➤ Application Help ➤ Function-Oriented View: English ➤ Security ➤ Identity Management ➤ User and Role Administration of Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.3</td>
<td>➤ Application Help ➤ Function-Oriented View: English ➤ Security ➤ Identity Management ➤ User and Role Administration of Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>➤ Application Help ➤ Function-Oriented View: English ➤ Security ➤ Identity Management ➤ User and Role Administration of Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td>➤ Application Help ➤ Function-Oriented View: English ➤ Security ➤ Identity Management ➤ User and Role Administration of Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td>➤ Application Help ➤ Function-Oriented View: English ➤ Security ➤ Identity Management ➤ User and Role Administration of Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td>➤ Application Help ➤ Function-Oriented View: English ➤ Security ➤ Identity Management ➤ User and Role Administration of Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
<td>➤ Application Help ➤ Function-Oriented View: English ➤ Security ➤ Identity Management ➤ User and Role Administration of Application Server ABAP ➤ Configuration of User and Role Administration ➤ Directory Services ➤ LDAP Connector</td>
</tr>
</tbody>
</table>

### Prerequisites

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

- Make sure that the required software is installed:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Required Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIX</td>
<td>IBM Tivoli Directory Server client packages</td>
</tr>
<tr>
<td>HP-UX</td>
<td>The LDAP libraries listed in SAP Note 541344</td>
</tr>
<tr>
<td>Linux</td>
<td>You must have at least the following RPM packages installed:</td>
</tr>
<tr>
<td></td>
<td>○ Oracle Linux:</td>
</tr>
<tr>
<td></td>
<td>openldap2</td>
</tr>
<tr>
<td></td>
<td>○ Red Hat Linux:</td>
</tr>
<tr>
<td></td>
<td>openldap2</td>
</tr>
<tr>
<td></td>
<td>○ SUSE LINUX</td>
</tr>
<tr>
<td></td>
<td>openldap2</td>
</tr>
<tr>
<td></td>
<td>openldap2-client</td>
</tr>
<tr>
<td>Solaris</td>
<td>You must have at least the libldap.so library installed.</td>
</tr>
</tbody>
</table>

**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=pcintel6 p24709`) if one of the following is true:
  - The client is not located in the same domain forest as the Active Directory
  - The operating system does not have a directory service client (Windows NT and Windows 9X without installed `dsclient`).
  For more information, see the SAP system profile parameter `ldap/servers`.
- For other directory services, you can use `LDAPnode` to specify the distinguished name of the SAP root node. For more information, see the SAP system profile parameter `ldap/saproot`.

**SAP MMC**

The SAP MMC is a graphical user interface (GUI) for administering and monitoring SAP systems from a central location. It is automatically set up when you install an SAP system on Windows. If the SAP system has been prepared correctly, the SAP MMC presents and analyzes system information that it gathers from various sources, including the Active Directory.

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

If you need to administer distributed systems, we especially recommend that you use the SAP MMC together with Active Directory services. You can keep track of significant events in all of the systems from a single SAP MMC interface. You do not need to manually register changes in the system configuration. Instead, such changes are automatically updated in the directory and subsequently reflected in the SAP MMC.

If your SAP system is part of a heterogeneous SAP system landscape that comprises systems or instances both on Unix and Windows operating systems, you can also use the SAP MMC for operating and monitoring the instances running on Unix.

**SAP MC**

The SAP MC is a graphical user interface (GUI) for administering and monitoring SAP systems from a central location. The SAP MC is automatically set up when you install an SAP system on any platform. If the SAP system has been prepared correctly, the SAP MC presents and analyzes system information that it gathers from various sources, including a generic LDAP Directory.

Integrating a generic LDAP Directory as a source of information has advantages for the SAP MC. It can read system information straight from the directory that automatically registers changes to the system landscape. As a result, up-to-date information about all SAP application servers, their status, and parameter settings is always available in the SAP MC.
For more information about the SAP MC and about how to configure it to access LDAP directories, see the documentation SAP Management Console in the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3</td>
<td>Application Help ➤ Function-Oriented View: English ➤ Solution Life Cycle Management ➤ SAP Management Console</td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
</tbody>
</table>

Configuration Tasks for LDAP Directories

This section describes the configuration tasks for the Active Directory or other (generic) LDAP directories.

- **Configuration Tasks for Active Directory**
  To enable an SAP system to use the features offered by the Active Directory, you have to configure the Active Directory so that it can store SAP system data.
  To prepare the directory, you use the installer to automatically:
    - Extend the Active Directory schema to include the SAP-specific data types
    - Create the domain accounts required to enable the SAP system to access and modify the Active Directory. These are the group SAP_LDAP and the user sapldap.
    - Create the root container where information related to SAP is stored
    - Control access to the container for SAP data by giving members of the SAP_LDAP group permission to read and write to the directory
  You do this by running the installer on the Windows server on which you want to use Active Directory Services and choosing [Generic Installation Options] ➤ [Preparations] ➤ [LDAP Registration] ➤ [Active Directory Configuration]. For more information about running the installer on Windows, see the documentation Installation Guide – <Product> on Windows: <Database>.

  **Note**
  You have to configure the directory server only **once**. Then all SAP systems that need to register in this directory server can use this setup.

- **Configuration Tasks for Generic LDAP Directories**
  To configure other LDAP directories, refer to the documentation of your directory vendor.

- **Enabling the SAP System LDAP Registration**
  Once you have correctly configured your directory server, you can enable the LDAP registration of the SAP system by setting some profile parameters in the default profile.
  To do this, run the installer [page 114] **once** for your system and choose:

  [Generic Installation Options] ➤ [Preparations] ➤ [LDAP Registration] ➤ [LDAP Support]
If you use a directory server other than Microsoft Active Directory and/or non-Windows application servers, you have to store the directory user and password information by using `ldappasswd pf=<any_instance_profile>`. The information is encrypted for storage in `DIR_GLOBAL` and is therefore valid for all application servers. After restarting all application servers and start services, the system is registered in your directory server. The registration protocols of the components are `dev_ldap*`. The registration is updated every time a component starts.

### 7.2 Installation of Multiple Components in One Database

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

**Recommendation**

MCOD is generally available and there is no intention to de-support this installation feature. However, SAP recommends that customers should **not** use the MCOD feature when installing new systems.

The major drawbacks are as follows:

- Previous-point-in-time (PPT) recovery of a single system within an MCOD installation becomes a highly complex and time-consuming procedure.
- SAP Landscape Management (LaMa) is generally not supported for MCOD installations. For more information, see SAP Note [1709155](https://support.sap.com/1709155).
- There are strong dependencies, for example on the database version used for the MCOD system.
- Downtime – planned or unplanned - always affects all systems sharing the same database.

**Exception:** In case of a dual-stack split you can use the “Keep Database” option thus keeping ABAP and Java stack in one database. There, the PPT recovery problem does not apply because both stacks belong logically together and would always be recovered jointly anyhow. However, keep in mind that even for this specific case the introduction of SAP Landscape Management would require a split into separate database subsystems.

Additional information might be available in SAP Note [2146542](https://support.sap.com/2146542).

MCOD is available with all SAP components and all the major databases for the SAP system. No extra effort is required because the MCOD installation is fully integrated into the standard installation procedure. MCOD is not an additional installation option. Instead, it is an option of the database instance installation.

A productive SAP system with SAP HANA database cannot be an MCOD system. For more information about the supported MCOD systems with SAP HANA Database, see SAP Notes [1661202](https://support.sap.com/1661202) and [1681092](https://support.sap.com/1681092).

With MCOD we distinguish two scenarios:

- The installation of an SAP system in a new database
- The installation of an additional SAP system in an existing database (MCOD)
Prerequisites

- For more information about MCOD and its availability on different platforms, see *Multiple Components in One Database (MCOD)* at: https://wiki.scn.sap.com/wiki/pages/viewpage.action?pageId=448466580.
- Since SAP does not support mixed solutions with MCOD, your SAP system must contain Unicode SAP instances only.
- Improved sizing required
  
  You calculate the CPU usage for an MCOD database by adding up the CPU usage for each individual SAP system. You can do the same for memory resources and disk space.
  
  You can size multiple components in one database by sizing each individual component using the Quick Sizer tool and then adding the requirements together. For more information about the Quick Sizer, see http://sap.com/sizing.

Features

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

Note

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

Constraints

- We **strongly recommend** that you test MCOD in a test or development system. We recommend that you run MCOD systems in the same context. We do not recommend that you mix test, development, and production systems in the same MCOD.
- In the event of database failure, all SAP systems running on the single database are affected.
- Automated support in an MCOD landscape for the following administrative tasks depends on your operating system and database:
  - Copying a single component from an MCOD landscape to another database at database level.
  - Uninstalling a single component from an MCOD landscape requires some additional steps. You can use a remote connection to SAP support to request help with these tasks. For more information, see http://support.sap.com/remoteconnection.
- You **cannot** install a Unicode ABAP system with a non-Unicode ABAP system in one database.
For the first SAP system, the database system ID can be different from the SAP system ID.
For the second SAP system, you must use the same <DBSID> as for the first SAP system.
If you decide to turn off database logging during the database load phase of the installation, you need to plan downtime for all MCOD systems sharing the database.

7.3 Creating a User for LDAP Directory Access

Use

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

For more information, see Integration of LDAP Directory Services in the Windows installation guide for your SAP system solution and database.

Prerequisites

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

Procedure

1. Log on as user <sapsid>adm.
2. Enter:
   `ldappasswd pf=<Path_and_Name_of_Instance_Profile>`
3. Enter the required data.

![Example]

The following is an example of an entry to create an LDAP Directory User:

`CN=sapldap,CN=Users,DC=nt5,DC=sap-ag,DC=de`

7.4 Exporting and Mounting Directories via NFS
7.4.1 Exporting and Mounting Directories via NFS for AIX

This topic is only valid for 'Platform': AIX

This procedure describes how to export and mount directories via NFS for AIX using the command line.

Context

This section only provides the basic procedure. If you need more detailed information, check your OS vendor’s documentation.

Procedure

- To export an NFS filesystem, do the following steps:
  a. Take the backup of the exports file:
     ```bash
     cp -p /etc/exports /etc/exports_bak
     ```
  b. Create an entry for each directory to be exported, using the full path name of the directory:
     ```bash
     vi /etc/exports
     ```
  c. Read the `/etc/exports` file and export all the directories listed:
     ```bash
     exportfs -a
     ```
  d. Confirm the exported directory listed:
     ```bash
     showmount -e
     ```
  e. Confirm the nfs client name and directory list:
     ```bash
     showmount -a
     ```
- Mounting the NFS filesystem on the client:
  a. Verify if the NFS server has exported the directory.
     ```bash
     showmount -e <server_name>
     ```
  b. Create the mounting directory if not already exist.
     ```bash
     mkdir /local_directory
     ```
  c. Mount the remote directory on the client:
mount <ServerName>:/<remote_directory> /<local_directory>

d. Confirm that the NFS filesystem has been mounted:

df -gt <NFS mount_name>

End of 'Platform': AIX

7.4.2 Exporting and Mounting Directories via NFS for HP-UX

This topic is only valid for ‘Platform’: HP-UX

This section describes how to export and mount directories via NFS for HP-UX manually.

Context

This section only provides the basic procedure. If you need more detailed information, check your OS vendor’s documentation.

Procedure

1. On the host where you want to export directories do the following:
   a. Add the file system that you want to export to the file /etc/dfs/dfstab using the following syntax:

   share -F nfs -o root= <client_1>:<client_n> access= <client_1>:<client_n> 
   <file system to share>

   share -F nfs -o root=hw5111:hw5115, access=hw511:hw5115 /sapmnt/C11/exe.

   If you encounter problems, try using the FQDN (Fully Qualified Domain Name).

   b. To make the file system available to NFS clients, enter the following command:

   /usr/sbin/shareall

2. On the host where you want to mount the directories you exported in the previous step, do the following:
   a. Add the remote file system to /etc/fstab.

   hw5115:/sapmnt/C11 /sapmnt/C11 nfs defaults 0 0

   b. Mount the file system.
7.4.3 Exporting and Mounting Directories via NFS for Linux

This topic is only valid for 'Platform': Linux
To export directories via NFS, perform the following steps.

Context

This section only provides the basic procedure. If you need more detailed information, check your OS vendor’s documentation.

The following procedure assumes that the central instance host is the NFS server.

Procedure

1. Log on as user root to the NFS server.
2. Make sure that your host is configured as NFS server as follows:
   ○ On Red Hat Linux, make sure that the output of the command:
     `chkconfig --list nfs`
     The output looks as follows:
     ```
     Example
     nfs 0:off 1:off 2:off 3:on 4:on 5:on 6:off
     ```
   ○ On SUSE Linux, enter the following command:
     `yast2`

   You can set up your host as NFS server as follows:
   ○ On Red Hat Linux, enter the following command:
     `system-config-users`
   ○ On SUSE Linux, enter the following command:
     `yast2`

3. To export a directory from a local file system, you can proceed as follows:
   ○ On Red Hat Linux, use the following tool:
     `system-config-nfs`
   ○ On SUSE Linux, use the following tool:
     `yast2`

   Perform the configuration manually.
To perform the configuration manually, proceed as follows:

a. To add a line to the local file /etc/exports, enter the following:

```
#/etc/exports
<directory> <hostname> (options)
```

**Note**
There must **not** be a blank between `<hostname>` and `<options>`. Otherwise, the directory is exported with default option (ro) (read-only) to the host specified by `<hostname>` and with the option specified by `<options>` to all other hosts.

To export directories on Linux with root permissions, use the option no_root_squash. For security reason, **only** use this option during installation.

**Example**

○ To export the directory /usr/sap/trans in read-only mode to the NFS client host.wdf.sap-ag.de, enter the following:

```
#/etc/exports
/usr/sap/trans host.wdf.sap-ag.de (ro)
```

○ To export the directory in read-write mode with root permissions, enter the following:

```
#/etc/exports
/usr/sap/trans host.wdf.sap-ag.de (rw, no_root_squash)
```

○ To export the directory to all NFS clients of the domain using a wildcard (*), enter the following:

```
#/etc/exports
/usr/sap/trans *.wdf.sap-ag.de (rw)
```

b. To activate the changes (that is, inform the NFS daemon about the changes performed in /etc/exports), enter the following command:

```
exportfs -r
```

c. To see a list of all currently exported directories, enter the following command:

```
exportfs -v
```

For more information, consult the man page by entering `man exports`.

4. Log on as user root to the host where the file system is to be imported.

5. To mount the file systems, enter the following command:

```
mount <nfs_server>:<file_system> <mount_point>
```
7.4.4 Exporting and Mounting Directories via NFS for Oracle Solaris

This topic is only valid for ‘Platform’: Oracle Solaris

To mount directories via NFS from the host where the directory resides that you want to mount, log on as user root and proceed as follows.

Context

This section only provides the basic procedure. If you need more detailed information, check your OS vendor’s documentation.

Procedure

- On the host on which the directory to be mounted resides:
  a. Enter the following command:
     ```
     /usr/sbin/share
     ```
  b. To add file systems shared via NFS, edit file `/etc/dfs/dfstab`:
     ```
     vi /etc/dfs/dfstab
     ```
    Add the following line for each file system:
    ```
    share -F nfs -o root=<nfsclient1>:<nfsclient2>,anon=0 -d "description" <file_system_to_be_shared>
    ```

  i Note

  Depending on your configuration, a full qualified name may be required for nfsclient, for example, myclient.mydomain.com.

  Caution

  After your SAP system has been installed successfully, in the above line you have to change -o root to -o rw (or remove anon=0, respectively) for all exported directories:
  ```
  share -F nfs -o rw=<nfsclient1>:<nfsclient2> -d "description" <file_system_to_be_shared>
  ```
c. If the `/etc/dfs/dfstab` was empty, the NFS server is not active.
   
   ○ On Solaris 9, start the NFS server with the following command:
     `/etc/init.d/nfs.server start`
   
   ○ On Solaris 10, start the NFS server with the following command:
     `svcadm enable svc:/network/nfs/server:default`

d. To see if the NFS server is active and which partitions are mountable, enter the command:

   `showmount -e <NFS-server>`

   • On the host on which the additional instance runs:

   a. If you are mounting NFS disks for the first time, the NFS client software is not active.
      
      ○ On Solaris 9, start the NFS server with the following command:
        `/etc/init.d/nfs.client start`
      
      ○ On Solaris 10, start the NFS server with the following command:
        `svcadm enable svc:/network/nfs/client:default`

   b. Edit the file `/etc/vfstab` to mount the directory:

      Edit the file `/etc/vfstab` to mount the directory:
      
      `vi /etc/vfstab`
      
      Add the following line for each file system:
      
      `<host_name_where_directory_resides>:<file_system_to_be_shared> - <mount point> nfs - yes -`

      If the mount point exists, mount `<file_system_to_be_shared>` with the command:

      `mount <mount point>`

---

7.5 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](https://support.sap.com) for more information on:

- Supported combinations of operating systems and database systems
- How to install an application server on Windows in a heterogeneous (UNIX) SAP system environment
- Heterogeneous SAP system landscapes with different UNIX operating systems
7.6 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 savoscol

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

   For more information, see hardware and software requirements [page 38].

2. Make sure that the sapadm user is created.
During the installation, the installer checks all required accounts (users, groups) and services on the local machine. The installer checks whether the required users and groups already exist. If not, it creates new users and groups as necessary.

**User and Groups of the SAP Host Agent**

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
<th>Additional Group</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapadm</td>
<td>sapsys</td>
<td>-</td>
<td>SAP Host Agent administrator</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapsys</td>
<td>sapadm</td>
</tr>
<tr>
<td>sapinst</td>
<td>sapadm</td>
</tr>
</tbody>
</table>

3. Set up the required file system for the SAP Host Agent:

<table>
<thead>
<tr>
<th>Directories</th>
<th>Description</th>
<th>Required Disk Space</th>
</tr>
</thead>
</table>
| `/usr/sap/hostctrl` | Contains the following directories:  
  - `exe`  
    Contains the profile `host_profile`  
  - `work`  
    Working directory of the SAP Host Agent | 100 MB |

For more information, see Setting up file systems and raw devices [page 78].

4. Download and unpack the Software Provisioning Manager 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 93].
5. Make the latest patch level of the SAPHOSTAGENT <Version>.SAR file available on the host where you want to install the SAP Host Agent.

You can do this in the following ways:

○ 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 7.21 <Operating System>
  ○ Alternatively, you can also copy it from the UC kernel medium (folder K_<Version>_U_<OS>), where "_U_" means Unicode.
  You can either use the physical UC kernel medium from the installation package of your SAP system, or download the kernel medium from https://launchpad.support.sap.com/#/softwarecenter. For more information, see Downloading Complete Installation Media [page 101].

➤ 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 start the installer [page 114] and choose Generic Installation Options <Database> Preparations SAP Host Agent on the Welcome screen of the installer.

7. Check whether the installed services are available:
   a. Log on as a user with root authorizations.

   ➤ 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:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>● SAP NetWeaver 7.3</td>
<td><a href="http://help.sap.com/nw73">Application Help ➤ Function-Oriented View: English ➤ Solution Life Cycle Management ➤ SAP Host Agent</a></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td>● SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
</tbody>
</table>

7.7 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 180]
- Using commands [page 184].

7.7.1 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) except the database instance.

Prerequisites

- Make sure that the host names defined in the DNS server match the names of the SAP system instance hosts. In particular, keep in mind that host names are case-sensitive. For example, if the names of the SAP system instance hosts are in upper case, but the same host names are defined in the DNS server in lower case, starting and stopping the system does not work.
If you want to start or restart remote systems or instances, make sure that you have registered them in the SAP Management Console (SAP MC). You do not need to register SAP systems or instances installed on the local host, because the SAP MC displays them automatically.

- The SAP Host Agent is installed on the host where the application server of the SAP system or instance runs.
- You have installed Java Runtime Environment (JRE) 5.0 or higher.
- Your Web browser supports Java.
- Your Web browser’s Java plug-in is installed and enabled to run scripting of Java applets.

**Context**

**Recommendation**

If you experience any issues when starting or using the SAP MC, refer to SAP Note 1153713.

For more information about handling the SAP MC, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3</td>
<td>Application Help</td>
</tr>
<tr>
<td><strong><a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></strong></td>
<td>Function-Oriented View: English</td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Solution Life Cycle Management</td>
</tr>
<tr>
<td><strong><a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></strong></td>
<td>SAP Management Console</td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td><strong><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></strong></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td><strong><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></strong></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td><strong><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></strong></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
<tr>
<td><strong><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></strong></td>
<td></td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

### 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](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](http://saphost06:55313)

  This starts the SAP MC Java applet.

  **Note**

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

  2. Choose **Start**.

  The SAP Management Console (SAP MC) appears.

  By default, the instances installed on the host you have connected to are already added in the SAP MC.

  **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.

Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user <sapsid>adm.

Starting SAP System Instances Successively

If you need to start the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Start the database instance.
2. Start the ABAP central services instance ASCS<Instance_Number>.
3. Start the primary application server instance D[VEBMGS]<Instance_Number>.
4. Start additional application server instances D<Instance_Number>, if there are any.

Note

In SAP systems based on SAP NetWeaver 7.5 or higher, the primary application server instance is named D<Instance_Number>.
In SAP systems based on SAP NetWeaver 7.4 or lower, the primary application server instance is named DVEBMGS<Instance_Number>.

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.

Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user <sapsid>adm.

Stopping SAP System Instances Successively
If you need to stop the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Stop additional application server instances D<Instance_Number>, if there are any.
2. Stop the primary application server instance D[VEBMGS]<Instance_Number>.

**Note**

In SAP systems based on SAP NetWeaver 7.5 or higher, the primary application server instance is named D<Instance_Number>.

In SAP systems based on SAP NetWeaver 7.4 or lower, the primary application server instance is named D[VEBMGS]<Instance_Number>.

3. Stop the ABAP central services instance ASCS<Instance_Number>.
4. Stop the database instance.

### 7.7.2 Starting and Stopping SAP System Instances Using Commands

**Prerequisites**

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

**Context**

**Note**

The startsap and stopsap commands are deprecated. SAP recommends that you do not use them any longer. For more information, see SAP Notes 1763593 and 809477.

This section only lists the basic commands how to start or stop an SAP system. You can find a detailed list of all SAPControl options and features in the command line help, which you can call as follows:

/usr/sap/hostctrl/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/hostctrl/exe/sapcontrol -nr <instance_number> -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/hostctrl/exe/sapcontrol -nr <instance_number> -function Start
  ```
  
  For remote instances, the syntax is slightly different, because you also have to apply the `-host` and `-user` parameters:
  
  ```
  /usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -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/hostctrl/exe/sapcontrol -nr <instance_number> -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/hostctrl/exe/sapcontrol -nr <instance_number> -function Stop
      ```
      
      For remote instances, the syntax is slightly different, because you also have to apply the `-host` and `-user` parameters:
      
      ```
      /usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function Stop
      ```

    - **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/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function GetSystemInstanceList
      ```
    
    - With the following command you get a list of instance processes and their status:
      
      ```
      /usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -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.
7.8 Deleting an SAP System or Single Instances

This section describes how to delete a complete SAP system or single SAP instances with the Uninstall option of the installer.

Prerequisites

- You have installed your SAP system with standard SAP tools according to the installation documentation.
- You are logged on as a user with root permissions.

⚠️ Caution

Do not use the <sapsid>adm user to delete the SAP system.

- Make sure that the SAP system, or single instance, or standalone engine, or optional standalone unit to be deleted is down and that you are not logged on as one of the SAP system users. Also check that all SAP-related processes are stopped. If there is a lock on one of the SAP system objects, the uninstall fails.

ℹ️ 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 installer. However, you can also delete an SAP system or single instance manually. For more information, see SAP Note 1259982.
- You cannot delete an SAP system remotely.
- If you delete network-wide users, groups or service entries in an environment with Network Information System (NIS), other SAP installations might also be affected. Make sure that the users, groups, and service entries to be deleted are no longer required.
- During the uninstall process, all file systems and subdirectories of the selected SAP system or single instance are deleted. Before you start uninstalling, check that you have saved a copy of all files and directories that you want to keep to a secure location.
- The uninstall process is designed to remove as much as possible of the SAP system to be deleted. If an item cannot be removed, a message informs you that you have to remove this item manually. You can do this either at once or after the uninstall process has finished. As soon as you confirm the message, the uninstall process continues.
Procedure

1. Start the installer as described in Running the Installer [page 114].
2. On the Welcome screen, choose:
   - [Generic Installation Options] <Database> Uninstall Uninstall SAP Systems or Single Instances
3. Follow the instructions on the installer screens to delete a complete SAP system or single instances.

   **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.

The following table provides information about deleting a complete system or single instances with the installer.

<table>
<thead>
<tr>
<th>Deletion of</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard system</td>
<td>You can delete a standard system (where all instances except the database instance reside on the same host) in one installer run.</td>
</tr>
<tr>
<td>Distributed or high-availability</td>
<td>If you want to delete a distributed or high-availability system, you have to run the installer to delete the required instances <strong>locally</strong> on each of the hosts belonging to the SAP system in the following sequence:</td>
</tr>
<tr>
<td>system</td>
<td>1. Additional application server instances, if there are any</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>Do <strong>not</strong> select checkbox Uninstall all instances of the SAP system from this host if you do <strong>not</strong> want to uninstall the complete SAP system or standalone engine. For example, do not select this checkbox if you only want to uninstall an additional application server instance of an existing SAP system distributed over several hosts. Otherwise the contents of mounted global directories under <code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/</code>, such as instance profiles and kernel executables, are also deleted.</td>
</tr>
<tr>
<td></td>
<td>2. Primary application server instance</td>
</tr>
<tr>
<td></td>
<td>3. Database instance</td>
</tr>
<tr>
<td></td>
<td>Do <strong>not</strong> delete the SAP HANA database instance. However, you can delete the database clients and the database users on the SAP application servers.</td>
</tr>
<tr>
<td></td>
<td>4. ABAP Central services instance (ASCS)</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>To delete system directories mounted from an NFS server, you have to run the installer on the NFS server.</td>
</tr>
</tbody>
</table>
If you want to delete additional application server instances of an existing SAP system, you have to run the installer to delete them **locally** on each additional application server instance host.

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 *Profiles Available* and select *Uninstall Standalone SAP Host Agent* on the *General SAP System Parameters* 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+Duplicate+System+Entries
Important Disclaimers and Legal Information

Coding Samples

Any software coding and/or code lines / strings ("Code") included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended to better explain and visualize the syntax and phrasing rules of certain coding. SAP does not warrant the correctness and completeness of the Code given herein, and SAP shall not be liable for errors or damages caused by the usage of the Code, unless damages were caused by SAP intentionally or by SAP's gross negligence.

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