Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise
# Content

## 1 About this Document
1.1 Naming Conventions ................................................. 9
1.2 Constraints .......................................................... 10
1.3 Before You Start .................................................... 11
1.4 SAP Notes for the Installation .................................... 11
1.5 New Features ......................................................... 12

## 2 Installation Options Covered by this Guide
2.1 Standard System .................................................... 19
2.2 Distributed System .................................................. 20
2.3 High-Availability System .......................................... 21
2.4 Additional Application Server Instance ...................... 22
2.5 SCS Instance with Integrated SAP Web Dispatcher ........ 25
2.6 SAP Host Agent as a Separate Installation ................. 27

## 3 Planning
3.1 Planning Checklist .................................................. 29
3.2 Changed File System Structure and Profiles for SAP Systems Based on SAP NetWeaver 7.1 and Higher .................................................. 30
3.3 Installation Using a Stack Configuration File ................. 31
3.4 Hardware and Software Requirements ......................... 33
   Running the Prerequisites Check in Standalone Mode (Optional) ............................................. 34
   Requirements for the SAP System Hosts ...................... 35
3.5 Planning User and Access Management ....................... 46
3.6 Basic Installation Parameters ................................... 47
   SAP System Parameters ........................................ 48
   SAP System Database Parameters .......................... 58
   Parameters for Additional Components to be Included in the SCS Instance (Optional) .................. 58
3.7 Setup of Database Layout .......................................... 59
3.8 SAP System Transport Host ...................................... 61
3.9 Planning the Switchover Cluster for High Availability .... 61

## 4 Preparation
4.1 Preparation Checklist .............................................. 65
4.2 Creating Operating System Users and Groups .............. 65
4.3 Required File Systems and Directories ....................... 66
   SAP Directories .................................................. 71
   Setting Up File Systems for a High-Availability System .............................................. 75
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4</td>
<td>Using Virtual Host Names.</td>
<td>79</td>
</tr>
<tr>
<td>4.5</td>
<td>Performing Switchover Preparations for High Availability.</td>
<td>79</td>
</tr>
<tr>
<td>4.6</td>
<td>Preparing an External ABAP System as Source for User Data.</td>
<td>80</td>
</tr>
<tr>
<td>4.7</td>
<td>Preparing the Installation Media.</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Media Required for the Installation - Listed by SAP System Instance.</td>
<td>83</td>
</tr>
<tr>
<td>5</td>
<td>Installation.</td>
<td>95</td>
</tr>
<tr>
<td>5.1</td>
<td>Installation Checklist.</td>
<td>95</td>
</tr>
<tr>
<td>5.2</td>
<td>Exporting and Mounting the Transport Directory.</td>
<td>100</td>
</tr>
<tr>
<td>5.3</td>
<td>Exporting and Mounting Global Directories.</td>
<td>101</td>
</tr>
<tr>
<td>5.4</td>
<td>Specifying the Initial Data Source of the User Management Engine.</td>
<td>103</td>
</tr>
<tr>
<td>5.5</td>
<td>Prerequisites for Running the Installer.</td>
<td>104</td>
</tr>
<tr>
<td>5.6</td>
<td>Running the Installer.</td>
<td>107</td>
</tr>
<tr>
<td>5.7</td>
<td>Additional Information about the Installer.</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>Useful Information about the Installer.</td>
<td>113</td>
</tr>
<tr>
<td></td>
<td>Interrupted Processing of the Installer.</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Entries in the Services File Created by the Installer.</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Troubleshooting with the Installer.</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>Using the Step State Editor (SAP Support Experts Only).</td>
<td>120</td>
</tr>
<tr>
<td>6</td>
<td>Post-Installation.</td>
<td>121</td>
</tr>
<tr>
<td>6.1</td>
<td>Post-Installation Checklist.</td>
<td>121</td>
</tr>
<tr>
<td>6.2</td>
<td>Logging On to the Application Server Java.</td>
<td>122</td>
</tr>
<tr>
<td>6.3</td>
<td>Logging On to the SAP Enterprise Portal.</td>
<td>124</td>
</tr>
<tr>
<td>6.4</td>
<td>Logging On to the Development Infrastructure.</td>
<td>125</td>
</tr>
<tr>
<td>6.5</td>
<td>Providing Access to the SAP NetWeaver Administrator.</td>
<td>126</td>
</tr>
<tr>
<td>6.6</td>
<td>Installing the SAP License.</td>
<td>126</td>
</tr>
<tr>
<td>6.7</td>
<td>High Availability: Setting Up Licenses.</td>
<td>127</td>
</tr>
<tr>
<td>6.8</td>
<td>Configuring the Remote Connection to SAP Support.</td>
<td>129</td>
</tr>
<tr>
<td>6.9</td>
<td>Connecting the System to SAP Solution Manager.</td>
<td>129</td>
</tr>
<tr>
<td>6.10</td>
<td>Applying the Latest Kernel and Support Package Stacks.</td>
<td>131</td>
</tr>
<tr>
<td>6.11</td>
<td>PI 7.5 Only: Configuring the Process Integration System After the Installation.</td>
<td>132</td>
</tr>
<tr>
<td>6.12</td>
<td>PI-PCK, PI-AF, PI-AEX, PI-CP Only: System Configuration After the Installation.</td>
<td>133</td>
</tr>
<tr>
<td>6.13</td>
<td>Configuring the User Management.</td>
<td>137</td>
</tr>
<tr>
<td>6.14</td>
<td>Ensuring User Security.</td>
<td>137</td>
</tr>
<tr>
<td>6.15</td>
<td>Performing Automated Configuration.</td>
<td>140</td>
</tr>
<tr>
<td>6.16</td>
<td>Clearing the SLD Data Cache after Installing a Non-central Advanced Adapter Engine (Optional Standalone Unit).</td>
<td>141</td>
</tr>
<tr>
<td>6.17</td>
<td>Enabling the Database.</td>
<td>142</td>
</tr>
<tr>
<td>6.18</td>
<td>Performing a Full Installation Backup.</td>
<td>143</td>
</tr>
<tr>
<td>6.19</td>
<td>Logging on to the SAP Web Dispatcher Management Console.</td>
<td>145</td>
</tr>
<tr>
<td>6.20</td>
<td>SAP Web Dispatcher Configuration (Optional).</td>
<td>146</td>
</tr>
</tbody>
</table>
# SAP ASE 15.7: Disaster Recovery Setup with SAP Replication Server

- **Disaster Recovery Setup with SAP Replication Server.**
- **Implementation Considerations.**
- **Prerequisites.**
- **Installing the Replication Environment.**
  - Co-Located Replication Topology: Central Instance at the Primary Site.
  - Co-Located Replication Topology: PAS on a Separate Server.
  - Dislocated Replication Topology: Central Instance on a Separate Server.
- **Materializing Databases.**
- **Starting and Stopping the DR Agent and the Replication Server.**
- **Removing the Replication Environment.**
- **Integration of the SAP Replication Server into an OS Cluster Environment.**

# SAP ASE 16.0: Disaster Recovery Setup with SAP Replication Server

- **Disaster Recovery Setup with SAP Business Suite on SAP ASE 16.0.**

# Additional Information

- **Additional Information.**
- **Integration of LDAP Directory Services.**
- **Preparing an External ABAP System as Source for User Data.**
- **Installing the SAP Host Agent Separately.**
- **Starting and Stopping SAP System Instances.**
  - Starting and Stopping SAP System Instances Using the SAP Management Console.
  - Starting and Stopping SAP System Instances Using Commands.
- **Creating a User for LDAP Directory Access.**
- **Heterogeneous SAP System Installation.**
- **Enabling SSL Encrypted Data Transfer.**
- **Deleting an SAP System or Single Instances.**

# Appendix

- **Online Information from SAP.**
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>1.0</td>
<td>2012-12-17</td>
<td>First version for Software Provisioning Manager 1.0</td>
</tr>
<tr>
<td>1.1 - 1.3</td>
<td>2013-04-02 - 2013-10-28</td>
<td>Updated Versions: SL Toolset 1.0 SPS 07 - SPS 09</td>
</tr>
<tr>
<td>1.4</td>
<td>2014-03-17</td>
<td>Instead of a separate installation guide for each UNIX-based operating system, we now deliver a single installation guide for all UNIX-based operating systems. Sections that are only relevant for one or more operating systems are highlighted accordingly.</td>
</tr>
<tr>
<td>1.5 - 2.1</td>
<td>2014-07-07 - 2016-06-06</td>
<td>Updated Versions: SL Toolset 1.0 SPS 11 - SPS 17</td>
</tr>
</tbody>
</table>
| 2.2     | 2016-10-07    | Updated version for software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18):  
• Support for synchronous, near-synchronous and asynchronous replication for SAP Business Suite on SAP ASE 16.0. For more information, see Disaster Recovery Setup with SAP Business Suite on SAP ASE 16.0 [page 165]. |
| 2.3     | 2017-02-06    | 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 |
<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td>2017-05-22</td>
<td>Updated version for software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New Features:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ New SAPUI5-based graphical user interface (GUI) “SL Common GUI”,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>documented in: Prerequisites for Running the Installer, Running the Installer, Useful</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Information About the Installer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Cleanup of operating system users, documented in: SAP System Parameters, Creating Operating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>System Users and Groups</td>
</tr>
<tr>
<td>2.5</td>
<td>2017-09-11</td>
<td>Updated version for software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New Features:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Media Signature Check, documented in: New Features, Running the Installer, Preparing the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Installation Media</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This feature implies that section Creating Kernel Archives from an Existing SAP System has</td>
</tr>
<tr>
<td></td>
<td></td>
<td>been deleted from this documentation because the related option in the installer had to be</td>
</tr>
<tr>
<td></td>
<td></td>
<td>removed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Download Media for a Maintenance Plan, documented in: New Features, Downloading Media for a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintenance Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ SAP Host Agent Upgrade, documented in: New Features, SAP System Parameters, Downloading SAP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kernel Archives (Archive-Based Installation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Support of SSL, documented in: New Features, Enabling SSL encrypted data transfer.</td>
</tr>
<tr>
<td>Version</td>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2.6</td>
<td>2018-01-15</td>
<td>Updated version for Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
</tbody>
</table>

- **New Features:**
  - 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*
  - Installer Log Files Improvements, documented in: *New Features*, *Useful Information about the Installer*, *Troubleshooting with the Installer*
  - Enabling IPv6, documented in: *New Features*, *Prerequisites for Running the Installer*

- **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.

- **New Features** section restructured: 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:
  - 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*).
  - 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*

- **New section Using the Step State Editor (SAP Support Experts Only)** was added to section *Additional Information About the Installer*

- **Option to install the SCS instance with an integrated SAP Web Dispatcher**, documented in: *New Features*, *SCS Instance with Integrated SAP Web Dispatcher*, *Additional Parameters for an SAP Web Dispatcher Installation Integrated in the SCS Instance (Optional)*

**Note**

This feature was retroactively released on 2018-02-12.
<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.7</td>
<td>2018-05-07</td>
<td>Updated version for Software Provisioning Manager 1.0 SP23 (SL Toolset 1.0 SP23)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- New Features:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ New Installer Option Download Media for a Maintenance Plan, documented in: New Features, Downloading the Media for a Maintenance Planner Transaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Option to install the SCS instance with an integrated SAP Web Dispatcher, documented in: New Features, SCS Instance with Integrated SAP Web Dispatcher, Additional Parameters for an SAP Web Dispatcher Installation Integrated in the SCS Instance (Optional)</td>
</tr>
<tr>
<td>2.8</td>
<td>2018-09-17</td>
<td>Updated version for Software Provisioning Manager 1.0 SP24 (SL Toolset 1.0 SP24)</td>
</tr>
</tbody>
</table>
1 About this Document

This installation guide describes how to install an SAP system based on the application server Java of SAP NetWeaver 7.3 to 7.5 using the installation tool Software Provisioning Manager 1.0 SP24 (“installer” for short), which is part of SL Toolset 1.0 SP24.

**i Note**

As an alternative to using Software Provisioning Manager, you can install your system with a completely automated end-to-end framework available using SAP Landscape Management. For more information, see SAP Note 1709155 and [https://help.sap.com/lama](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 1554717.

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](http://support.sap.com/pam).

**Caution**

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

- **Naming Conventions [page 10]**
  This section lists the naming conventions that are currently apply for Software Provisioning Manager 1.0 (the “installer”) and terms used in this documentation.

- **Constraints [page 11]**
  This section lists the naming constraints that are currently valid for Software Provisioning Manager 1.0 (the “installer”) and this documentation.

- **Before You Start [page 11]**
  Make sure that you have read the release-specific “Master Guide” for your SAP Business Suite application, SAP NetWeaver application, or SAP Solution Manager system before you continue with this installation guide.

- **SAP Notes for the Installation [page 12]**
  This section lists the most important SAP Notes relevant for an installation using Software Provisioning Manager

- **New Features [page 14]**
  This section provides an overview of the new features in Software Provisioning Manager 1.0 (the “installer” for short).
1.1 Naming Conventions

This section lists the naming conventions that are currently apply for Software Provisioning Manager 1.0 (the “installer”) and terms used in this documentation.

- 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 82].
  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_STACK_XML
    - Names of operating system user groups, such as the additional group sapinst

- “usage type”, “technical usage”, and “product instance”
  As of Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12), the term “product instance” replaces the terms “usage type” and “technical usage” for 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 14].

- “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 7.4 / SAP NetWeaver 7.5.
- “Java system” refers to SAP system based on the application server Java of SAP NetWeaver 7.3 / 7.3 including Enhancement Package 1 / SAP NetWeaver 7.4 / 7.4 SR1 / SAP NetWeaver 7.5.
- “Diagnostics Agent” refers to the SAP Solution Manager Diagnostics Agent which is the remote component of End-to-End Root Cause Analysis. It allows having a connection between SAP Solution Manager and managed systems, and then to collect information from the managed systems for reporting purposes.
1.2 Constraints

This section lists the naming constraints that are currently valid for Software Provisioning Manager 1.0 (the “installer”) and this documentation.

- The Dual Stack option, which integrates an AS ABAP and AS Java in a single system (common System ID <SAPSID>, common startup framework, common database), is no longer supported in SAP systems based on SAP NetWeaver 7.5. So if you want to install a new SAP NetWeaver 7.5 Process Integration (PI) system which is based on SAP NetWeaver 7.5, do not use the documentation Installation Guide - SAP Systems Based on the Application Server ABAP+Java of SAP NetWeaver on <OS>: <DB>. Instead, use the Installation Guide - SAP Systems Based on the Application Server ABAP of SAP NetWeaver on <OS>: <DB> to install the ABAP stack with its own <SAPSID> and the Installation Guide - SAP Systems Based on the Application Server Java of SAP NetWeaver on <OS>: <DB> to install the Java stack with its own <SAPSID>. For more information, see the implementation sequence in the Master Guide - SAP NetWeaver 7.5 at http://help.sap.com/netweaver<Release> Installation and Upgrade.

- Not all SAP NetWeaver releases or SAP Business Suite applications that are available in Software Provisioning Manager 1.0 and are described in this installation guide have already been released. Always check 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 SAP Adaptive Server Enterprise Cluster Edition is not supported.

- Raw devices are not supported.

- The startsap and stopsap commands have been deprecated. For more information and for information on alternatives, see Starting and Stopping SAP System Instances Using Commands [page 180].

1.3 Before You Start

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

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

You can find a printed version of this guide in your installation package or you can download the latest version from https://help.sap.com.
The following table lists the “Master Guide” of the SAP system application for which you can use this installation guide, along with the available quick link or path to the appropriate download location:

<table>
<thead>
<tr>
<th>Document</th>
<th>Internet Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Guide (Including Upgrade Information) - SAP Supplier Relationship Management 7.0</td>
<td><a href="http://help.sap.com/srm">http://help.sap.com/srm</a></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>1748888</td>
<td>Inst. Systems Based on SAP NetWeaver 7.3 and higher: SAP ASE</td>
<td>Software Provisioning Manager 1.0: SAP NetWeaver 7.3 and higher</td>
</tr>
<tr>
<td>1554717</td>
<td>Planning Information for SAP on ASE</td>
<td>SAP release information for customers deploying SAP on ASE</td>
</tr>
<tr>
<td>1619967</td>
<td>SYB: DBA Cockpit Correction Collection SAP Basis 7.31</td>
<td>The implementation of SAP Note 1619967 directly after the installation is strongly recommended.</td>
</tr>
<tr>
<td>1882376</td>
<td>SYB: DBA Cockpit Correction Collection SAP Basis 7.4</td>
<td>The implementation of SAP Note 1882376 directly after the installation is strongly recommended.</td>
</tr>
<tr>
<td>2293673</td>
<td>SYB: DBA Cockpit Correction Collection SAP Basis 7.5</td>
<td>The implementation of SAP Note 2293673 directly after the installation is strongly recommended.</td>
</tr>
<tr>
<td>2380028</td>
<td>SYB: DBA Cockpit Correction Collection SAP Basis 7.51</td>
<td>The implementation of SAP Note 2380028 directly after the installation is strongly recommended.</td>
</tr>
<tr>
<td>1245200</td>
<td>ICF Service Activation for Web Dynpro DBA Cockpit</td>
<td>The Web browser-based version of the DBA Cockpit does not start correctly.</td>
</tr>
<tr>
<td>1585981</td>
<td>Backup Instructions for SAP on ASE</td>
<td>Information about backup and recovery</td>
</tr>
<tr>
<td>1650511</td>
<td>High Availability Offerings with SAP ASE</td>
<td>Information about high availability cluster solutions for SAP ASE</td>
</tr>
<tr>
<td>737368</td>
<td>Hardware requirements of Java Development Infrastructure</td>
<td>Information on the hardware requirements for Java Development Infrastructure, which depends on the size of your development team</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>
</tbody>
</table>
### 1.5 New Features

This section provides an overview of the new features in Software Provisioning Manager 1.0 (the “installer” for short).


<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Installer Option Download Software Packages for Maintenance Planner Transaction</td>
<td>If you perform an installation using a stack configuration file, you can now download media according to a Maintenance Plan. For more information, see [Installation Using a Stack Configuration File](page 31), [Downloading Software Packages for a Maintenance Planner Transaction](page 91), and <a href="https://blogs.sap.com/2018/06/01/software-provisioning-manager-new-option-for-standalone-download-service/">blogs.sap.com/2018/06/01/software-provisioning-manager-new-option-for-standalone-download-service/</a>.</td>
<td>Software Provisioning Manager 1.0 SP23 (SL Toolset 1.0 SP23)</td>
</tr>
<tr>
<td>Option to install an SCS instance with integrated SAP Web Dispatcher</td>
<td>You can now install an SAP Web Dispatcher in an SCS instance. You can choose this option while running the SCS instance installation. For more information, see [SCS Instance with Integrated SAP Web Dispatcher](page 25).</td>
<td>Software Provisioning Manager 1.0 SP23 (SL Toolset 1.0 SP23)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Installer Log Files Improvements</strong></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 113] and Troubleshooting with the Installer [page 119].</td>
<td>Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td><strong>Signature Check of Installation Archives</strong></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 87] and SAP Note 2541751 - SYB: SWPM RDBMS content has been tampered.</td>
<td>Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td><strong>Enabling IPv6</strong></td>
<td>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 104].</td>
<td>Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td><strong>Option to install an SCS instance with integrated SAP Web Dispatcher</strong></td>
<td>You can now install an SAP Web Dispatcher in an SCS instance. You can choose this option while running the SCS instance installation. For more information, see SCS Instance with Integrated SAP Web Dispatcher [page 25].</td>
<td>Software Provisioning Manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td><strong>Media Signature Check</strong></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 82] and Running the Installer [page 107].</td>
<td>Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td><strong>SAP Host Agent Upgrade During the Installation (Optional)</strong></td>
<td>During the Define Parameters 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 General Parameters table in SAP System Parameters [page 48].</td>
<td>Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td><strong>Secure Sockets Layer (SSL) encrypted data transfer</strong></td>
<td>The feature SSL encrypted data transfer is available for SAP ASE 16.0 SP02 starting with PL6. For general limitations and prerequisites refer to SAP Note 2481596 - SYB: Encrypted data transfer between SAP System and SAP ASE database. The SAP installer offers the possibility to enable the SSL encrypted data transfer via a checkbox. The SSL certificates are generated by the SAP installer and enabled for the database server and the SAP application server. There are no manual steps necessary to configure the usage of SSL for the purpose of encrypted data transfer. For more information see Enabling SSL Encrypted Data Transfer [page 182].</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>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>SL Common GUI with SAPINST 7.49</td>
<td>With the new installer framework version SAPINST 7.49, you can now use the new SAPUI5-based graphical user interface (GUI) “SL Common GUI”. For more information, see Useful Information about the Installer [page 113]. Running the Installer [page 107].</td>
<td>Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)</td>
</tr>
<tr>
<td>Cleanup of Operating System Users</td>
<td>You can now specify during the Define Parameters phase that the operating system users are to be removed from group sapinst after the execution of the installer has completed. For more information, see Operating System Users in SAP System Parameters [page 48].</td>
<td>Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)</td>
</tr>
<tr>
<td>Verification of Integrity of Data Units in Software Provisioning Manager</td>
<td>The integrity of data units extracted from the Software Provisioning Manager archive is verified. For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 86]. In addition, check SAP Note 1680045 whether additional information is available.</td>
<td>Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)</td>
</tr>
<tr>
<td>Support of Linux on IBM Power Systems (little endian)</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 2378874.</td>
<td>Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)</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 82].</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>
<tr>
<td>System Provisioning for SAP NetWeaver 7.5 and SAP NetWeaver 7.5-based Products</td>
<td>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 <code>&lt;SAPSID&gt;</code>, 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: <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td>Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP15)</td>
</tr>
<tr>
<td>System Provisioning for SAP Solution Manager 7.2</td>
<td>All system provisioning tasks (installation, system copy, system rename) are available for the new SAP Solution Manager 7.2 release. Compared to previous SAP Solution Manager releases, SAP Solution Manager 7.2 is no longer provided as a classical dual-stack system (ABAP system with Java Add-in), but consists of a separate ABAP and Java stack.</td>
<td>Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP15)</td>
</tr>
<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 <code>*.SAR</code> archives based on the <code>*.lst</code> files from the executable (<code>exe</code>) directories of the source SAP system.</td>
<td>Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP14)</td>
</tr>
</tbody>
</table>

**i Note**

This feature is only available for Unicode systems.

**Caution**

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.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<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>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. For more information, see SAP System Parameters [page 48].</td>
<td>Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
<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 104].</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>Valid only for SAP NetWeaver Composition Environment 7.1: Enterprise Services Repository</td>
<td>You can install Enterprise Services Repository in an existing SAP NetWeaver Composition Environment 7.1 system using the Add ESR Capability installation option, which is available on the Welcome screen at: SAP NetWeaver Composition Environment (CE) 7.1 ➔ Database ➔ SAP Systems ➔ Application Server Java ➔ Enterprise Services Repository Add-On</td>
<td>Software Provisioning Manager 1.0 SP05 (SL Toolset 1.0 SP10)</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.

After you have decided on the installation option that you want to use, continue with Planning [page 29].

- Standard System [page 19]
- Distributed System [page 20]
- High-Availability System [page 21]
- Additional Application Server Instance [page 22]
- SCS Instance with Integrated SAP Web Dispatcher [page 25]
- SAP Host Agent as a Separate Installation [page 27]

2.1 Standard System

You can install a standard system on a single host.

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

There are the following instances:

- Central services instance (SCS instance)
  Contains the Java message server and the Java enqueue server
  Optionally, you can install the SCS instance with an integrated SAP Web Dispatcher. For more information, see SCS Instance with Integrated SAP Web Dispatcher [page 25].
- Database instance (DB)
- Primary application server instance (PAS instance)

Additionally, you can install one or more additional application server instances. For more information, see Additional Application Server Instance [page 22].
2.2 Distributed System

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

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

- Central services instance (SCS instance)
  Contains the Java message server and the Java enqueue server
  Optionally, you can install the SCS instance with an integrated SAP Web Dispatcher. For more information, see SCS Instance with Integrated SAP Web Dispatcher [page 25].
- Database instance (DB)
  The Java stack uses its own database schema in the database.
- Primary application server instance (PAS)

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

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

Optionally, you can install one or more additional application server instances. For more information, see Installation of an Additional Application Server Instance [page 22].

*Note*

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

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

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

There are the following instances:

- Central services instance (SCS instance)
  Contains the Java message server and the Java enqueue server
  Optionally, you can install the SCS instance with an integrated SAP Web Dispatcher. For more information, see SCS Instance with Integrated SAP Web Dispatcher [page 25].
- ERS instance for the SCS instance (mandatory)
  The ERS instance contains the replication table, which is a copy of the lock table in the SCS instance.
- Database instance (DB)
- Primary application server instance (PAS)

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

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

To increase high availability by creating redundancy, we recommend that you install additional application server instances on hosts different from the primary application server instance host. For more information, see Installation of an Additional Application Server Instance [page 22].
The following figure shows an example for the distribution of the SAP system instances in a high-availability system.

![High-Availability System Diagram](image)

### 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 182]. For example, you need to do this if your primary application server instance runs on Linux for z System but the additional application server instance is to run on Windows.
**Additional Application Server Instance for a Standard System**

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

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

![Diagram of Additional Application Server Instance for a Standard System](image)

For more information, see [Standard System][page 19].

**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 High-Availability System

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

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

For more information, see Distributed System [page 20].
2.5 SCS Instance with Integrated SAP Web Dispatcher

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

**i 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 SCS instance and with its own SAP system ID and instance number - you have to install SAP Web Dispatcher separately as described in the documentation 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 &gt; Function-Oriented View &gt; Application</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></td>
<td>Server Infrastructure &gt; Components of SAP NetWeaver</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Application Server &gt; SAP Web Dispatcher</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>
<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>
</tbody>
</table>

Related Information

Parameters for Additional Components to be Included in the SCS Instance (Optional) [page 58]

2.6 SAP Host Agent as a Separate Installation

Under certain circumstances you need to install SAP Host Agent separately. Apart from performing this installation manually, you can also do this using the installer.

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.

Section Installing the SAP Host Agent Separately [page 174] describes how to perform the installation using Software Provisioning Manager 1.0.
Installing the SAP Host Agent Without Using Software Provisioning Manager

You can also install SAP Host Agent by downloading the SAPHOSTAGENT. SAR archive and running the installation from the command line. For more information, see the SAP Host Agent documentation 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><a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></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><a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
<td>SAP Host Agent</td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td>Host Agent Installation</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td>Installing SAP Host Agent</td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td>Manually</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
</tbody>
</table>
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 19]).

Standard, Distributed, or High-Availability System

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

1. 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 30].
2. If you want to install an SAP Java system along with the required Support Package stack in one implementation run, you need to plan the desired installation target using the maintenance planner at https://apps.support.sap.com/sap/support/mp.
   In the maintenance planner, a stack XML file with the desired Support Package stack and Add-On information is generated, which you then hand over to 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 31].
→ 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 33] on every installation host.
4. You plan how to set up user and access management [page 46].
5. You identify Basic SAP System Installation Parameters [page 47].
6. You carefully plan the setup of your database [page 59].
7. You decide on the transport host to use [page 61].
8. You decide whether you want to integrate LDAP Directory Services in your SAP system [page 167].
9. To install a high-availability system, you read Planning the Switchover Cluster for High Availability [page 61].
10. Continue with Preparation [page 65].

Additional Application Server Instance

1. You check the hardware and software requirements [page 33] for every installation host on which you want to install one or more additional application server instances.
2. You identify Basic SAP System Installation Parameters [page 47].
3. Continue with Preparation [page 65].

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 that you 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, 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
    - 1783371
    - 1743695
- You must have implemented SAP Note 1940845 in your SAP Solution Manager system.
- For additional information about involved tools and supported SAP system releases, see SAP Note 2277574.

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. 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.
- 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/.

i Note

The procedure and the screenshots provided in the linked document are only an example to show how an up-to-date installation works in general for an example SAP product, and what the benefits are. This document is not intended to serve as a detailed instruction for an up-to-date-installation of any supported SAP product.

- You can use the installer to directly download the installation software from SAP by providing the Maintenance Plan to the installer while running installer option Download Software Packages for Maintenance Planner Transaction.
  For more information, see Downloading Software Packages for a Maintenance Planner Transaction [page 91].
Integration

In addition, each section in this guide describing steps that are completely or at least partially automatized when using a stack configuration file is marked with an appropriate note at the beginning. These are the following sections as listed in the adjacent section Related Information:

Related Information

Preparing the Installation Media [page 82]
Running the Installer [page 107]
Applying the Latest Kernel and Support Package Stacks [page 131]

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 34].
     - Integrated in the installation tool (mandatory) as part of the installation process
       For more information, see Running the Installer [page 107].
   - The hardware and software requirements tables in Requirements for the SAP System Hosts [page 35].
3. If you want to install a production system, the values provided by the Prerequisite Checker and the hardware and software requirements checklists are not sufficient. In addition, do the following:
   ○ You use the Quick Sizer tool available at http://sap.com/sizing.
   ○ You contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing depending on:
     ○ The set of applications to be deployed
     ○ How intensively the applications are to be used
     ○ The number of users

3.4.1 Running the Prerequisites Check in Standalone Mode (Optional)

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 [page 86].
2. Make either the separate SAPEXE<Version>.SAR archive or the complete kernel medium available as described in Preparing the Installation Media [page 82].
3. Start the installer as described in Running the Installer [page 107].
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 86]
Preparing the Installation Media [page 82]

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.

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 36]
Hardware Requirements [page 37]
Software Requirements [page 41]
Other Requirements [page 45]
### 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.

#### General Installation Information for Your Operating System

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Information</th>
</tr>
</thead>
</table>
| **AIX**          | Before you start the installation, make sure that you have read SAP Note 1972803.  
In addition, we also recommend that you check the information available in the SAP on AIX space on the SAP Community Network at [https://www.sap.com/community/topic/aix.html](https://www.sap.com/community/topic/aix.html). |
| **HP-UX**        | Before you start the installation, make sure that you have read SAP Note 1075118.  
In addition, we also recommend that you check the information available in the SAP on HP-UX Best Practices space on the SAP Community Network at [https://www.sap.com/community/topic/hp-ux.html](https://www.sap.com/community/topic/hp-ux.html).  
SAP on ASE uses Concurrent I/O on HP-UX. The Veritas File System (Online JFS 5.0.1 or above) must be installed on your system prior to installing SAP applications on ASE and HP-UX. For more information, see SAP Note 1077887.  
SAP only supports the use of native binaries. Always use the appropriate SAP binaries for your processor. |
| **Linux**        | Before you start the installation, make sure that you have read the SAP Notes for your Linux distribution listed in the central SAP Note 2369910.  
In addition, we also recommend that you check the information available in the SAP on Linux space on the SAP Community Network at [https://www.sap.com/community/topic/linux.html](https://www.sap.com/community/topic/linux.html). |
| **Solaris**      | Before you start the installation, make sure that you have read SAP Note 1669684.  
In addition, we also recommend that you check the information available in the SAP on Oracle Solaris space on the SAP Community Network at [https://www.sap.com/community/topic/oracle-solaris.html](https://www.sap.com/community/topic/oracle-solaris.html). |
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.

Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</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.  
Database Instance: All 64-bit processors that are capable of running the supported operating system versions for SAP ASE.  
All other instances: 2 dual core CPUs or 4 single core CPUs.  
For an SCS 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   |
### Hard disk space

#### 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 82].
- If you prefer downloading the separate SAP kernel archives instead of using the complete SAP kernel media, you require 2 GB of temporary disk space for the set of SAP kernel archives that you have to copy to a local hard disk. For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 87].
- 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.
- For AS Java product instances such as Enterprise Portal, Enterprise Services Repository, and so on, check the sizing guide for your product instances at [https://sap.com/sizing](https://sap.com/sizing) under Sizing Guidelines Database and Technology.
- For more information about space requirements for the file systems and directories of the instances, see SAP Directories [page 71] and the appropriate database-specific information listed below.
  - Central services instance (SCS):
    - Minimum 2 GB
    - If you install the SCS 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.
  - ERS instance for the SCS instance (if required):
    - Minimum 2 GB
  - Database Instance:
    - Database instance: Minimum 40 GB (depending on the SAP product to be installed)
    - Database Software: 8 GB
    - For safety reasons (system failure), the file systems must be physically distributed over several disks or RAID-technology must be used.
  - Primary application server instance:
    - Minimum 4 GB for the AS Java + up to 2 GB for each additional “product instance” (SAP systems based on SAP NetWeaver lower than 7.3 EHP1: “usage type” or “software unit”) you want to install
  - Additional application server instance:
    - Minimum 4 GB for the AS Java + up to 2 GB for each additional “product instance” (SAP systems based on SAP NetWeaver lower than 7.3 EHP1: “usage type” or “software unit”) you want to install
  - SAP Host Agent:
    - Minimum 0.5 GB
<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><strong>i Note</strong></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><strong>End of 'Platform': AIX</strong></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.

- Central services instance (SCS instance)
  Minimum 1 GB
- ERS instance for the SCS instance (if required)
  Minimum 1 GB
- Database Instance:
  7 GB
- Primary application server instance:
  Minimum 8 GB
  - For more information about RAM required for Business Intelligence Java (BI Java), see SAP Note 927530.
  - For more information about RAM required for Java Development Infrastructure, see SAP Note 737368.
- Additional application server instance:
  Minimum 8 GB
- SAP Host Agent:
  Minimum 1 GB

**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**
**Requirement** | **Values and Activities**
--- | ---
**AIX: Paging space** | You need hard disk drives with sufficient paging space. You can calculate the required paging space as follows:

- Optimistic strategy:
  In addition, you need at least 20 GB for the primary application server instance and at least another 10 GB for the SCS instance and also for every additional application server instance.
- Defensive strategy:
  3 * RAM, at least 20 GB

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](https://launchpad.support.sap.com/#/notes/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](https://launchpad.support.sap.com/#/notes/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](https://launchpad.support.sap.com/#/notes/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](https://launchpad.support.sap.com/#/notes/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/4/softwarecenter](https://launchpad.support.sap.com/#/softwarecenter).
2. Make the SAPEXE.SAR archive available on the installation host. Either download it as described in [Downloading SAP Kernel Archives (Archive-Based Installation)](https://launchpad.support.sap.com/#/notes/1597355) 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 -1 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>SAP ASE 16.0 FOR BUS.SUITE / SYBASE ASE 15.7 FOR BUS.SUITE (The database software is automatically installed by the SAP installer, the Software Provisioning Manager.)</td>
<td>Check the Product Availability Matrix (PAM) at <a href="http://support.sap.com/pam">http://support.sap.com/pam</a> for supported database platforms.</td>
</tr>
<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>• SAP ASE 16.0 for Bus.Suite</td>
<td>AIX 7.2</td>
</tr>
<tr>
<td></td>
<td>AIX 7.1 TL 0 and higher</td>
</tr>
<tr>
<td></td>
<td>To check the operating system version, enter the following command: <code>oslevel -s</code></td>
</tr>
<tr>
<td></td>
<td>Required SPs</td>
</tr>
<tr>
<td></td>
<td><strong>AIX Level:</strong></td>
</tr>
<tr>
<td></td>
<td>AIX 7.1 TL0</td>
</tr>
<tr>
<td></td>
<td>AIX 7.1 TL 1</td>
</tr>
<tr>
<td></td>
<td>AIX 7.1 TL 2</td>
</tr>
<tr>
<td></td>
<td>AIX 7.1 requires a patch that fixes APARIV10828. Contact IBM directly to obtain the patch.</td>
</tr>
<tr>
<td>• Sybase ASE 15.7 for Bus.Suite</td>
<td>AIX 7.1</td>
</tr>
<tr>
<td></td>
<td>AIX 7.1 requires a patch that fixes APARIV10828. Contact IBM directly to obtain the patch.</td>
</tr>
<tr>
<td>Requirement</td>
<td>Values and Activities</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **HP-UX:** Operating system version | Your operating system platform must be 64-bit. Check the Product Availability Matrix (PAM) at [http://support.sap.com/pam](http://support.sap.com/pam) for supported operating system versions. To check the operating system version on your installation hosts, use the following command:  
  ```bash
  uname -r
  ```  
  See SAP Note [939891](http://support.sap.com/notes/939891) for information about support time frames of HP-UX. The following patches are required for HP-UX 11.31: PHSS_37493, PHSS_36352, PHKL_37802, PHKL_42687                                                                 |
| **Linux:** Operating system version | Your operating system platform must be 64-bit. Check the Product Availability Matrix (PAM) at [http://support.sap.com/pam](http://support.sap.com/pam) for supported operating system versions. Contact your OS vendor for the latest OS patches. To check the operating system version on your installation hosts, use the following command:  
  ```bash
  cat /etc/*-release
  ```  |
| **Oracle Solaris:** Operating system version | Your operating system platform must be 64-bit. Check the Product Availability Matrix (PAM) at [http://support.sap.com/pam](http://support.sap.com/pam) for supported operating system versions. To check the operating system version on your installation hosts, use the following command:  
  ```bash
  /bin/uname -r
  ```  |
<p>| SAP Kernel Releases and Versions | To use regular Software Provisioning Manager (SWPM10&lt;Version&gt;.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 <a href="http://support.sap.com/notes/2195019">2195019</a>. |
| <strong>AIX:</strong> Kernel parameters | To adjust the settings for asynchronous I/O if the database is installed using file systems, see SAP Note <a href="http://support.sap.com/notes/1972803">1972803</a>. To adjust AIX Virtual Memory Management settings, see SAP Note <a href="http://support.sap.com/notes/973227">973227</a>. |</p>
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP-UX: Kernel parameters</td>
<td>To run an SAP system, make sure that you check and, if necessary, modify the HP-UX kernel.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>We recommend that a UNIX system administrator performs all kernel modifications.</td>
</tr>
<tr>
<td></td>
<td>Proceed as follows:</td>
</tr>
<tr>
<td></td>
<td>1. Check SAP Note 172747 for recommendations on current HP-UX kernel parameters.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>2. If necessary, modify the kernel parameters in one of the following ways:</td>
</tr>
<tr>
<td></td>
<td>○ Manually, as described in SAP Note 172747.</td>
</tr>
<tr>
<td></td>
<td>○ Interactively, using the HP-UX System Administrator Manager (SAM) or System Management Homepage (SMH).</td>
</tr>
<tr>
<td>Linux: Kernel parameters</td>
<td>Check SAP Note 2369910 for Linux kernel versions certified by SAP.</td>
</tr>
<tr>
<td></td>
<td>To check the Linux kernel parameters for your Linux distribution, see one of the following SAP Notes:</td>
</tr>
<tr>
<td></td>
<td>● RHEL6: SAP Note 1496410</td>
</tr>
<tr>
<td></td>
<td>● RHEL7: SAP Note 2002167</td>
</tr>
<tr>
<td></td>
<td>● SLES 11: SAP Note 1310037</td>
</tr>
<tr>
<td></td>
<td>● SLES 12: SAP Note 1984787</td>
</tr>
<tr>
<td>Oracle Solaris: Kernel parameters</td>
<td>To run an SAP system, you must check and, if necessary, modify the Oracle Solaris kernel parameters or resource controls.</td>
</tr>
<tr>
<td></td>
<td>● Oracle Solaris 10: SAP Note 724713</td>
</tr>
<tr>
<td></td>
<td>● Oracle Solaris 11: SAP Note 1797712</td>
</tr>
<tr>
<td>HP-UX: OS patches</td>
<td>To check the minimum required OS patches, see SAP Note 837670.</td>
</tr>
<tr>
<td>Oracle Solaris: OS patches</td>
<td>Check the relevant SAP Note for required Oracle Solaris patches:</td>
</tr>
<tr>
<td></td>
<td>● Sun Solaris 10 on SPARC: SAP Note 83287</td>
</tr>
<tr>
<td></td>
<td>● Oracle Solaris 11: SAP Note 1797712</td>
</tr>
<tr>
<td>Requirement</td>
<td>Values and Activities</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>AIX</strong>: National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding locales are installed.</td>
</tr>
<tr>
<td><strong>HP-UX</strong>: National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding locales are installed.</td>
</tr>
<tr>
<td></td>
<td>You can check this as follows:&lt;br&gt;• Enter the following commands to check whether National Language Support (NLS) is installed:&lt;br&gt;  `swlist -v</td>
</tr>
<tr>
<td><strong>Linux</strong>: National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding locales are installed.</td>
</tr>
<tr>
<td></td>
<td>You can check this as follows:&lt;br&gt;• Ensure that the required locales such as the following are available:&lt;br&gt;  de_DE, en_US&lt;br&gt;• Check SAP Note 1878644 for information about corrected operating system locales and SAP blended Code Pages.</td>
</tr>
<tr>
<td><strong>Oracle Solaris</strong>: National Language Support (NLS)</td>
<td>Make sure that National Language Support (NLS) and corresponding locales are installed.</td>
</tr>
<tr>
<td></td>
<td>Enter the following command to check which locales are available:&lt;br&gt;  <code>locale -a</code>&lt;br&gt;  The following locale must be available: en_US.ISO8859-1</td>
</tr>
<tr>
<td><strong>System language</strong></td>
<td>For the installation, you must choose English as the operating system language on all hosts that run SAP software.</td>
</tr>
</tbody>
</table>
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>● peragent.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>If you want to use virtual host names, see SAP Note 962955.</td>
</tr>
</tbody>
</table>
### Requirement Values and Activities

**Login shell**
The installer only prompts you for this parameter if you use a login shell other than the recommended C shell (csh).

For more information, see SAP Note 202227.

Only valid for 'Platform': HP-UX

For HP-UX, see SAP Note 1038842 in addition.

End of 'Platform': HP-UX

**SAP Host Agent installation:**
- Make sure that `/bin/false` can be used as a login shell.
  
- Only valid for 'Platform': AIX
  
  AIX only: Add `/bin/false` to the list of valid login shells (attribute `shells`) in `/etc/security/login.cfg`.

End of 'Platform': AIX

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

**Shared file systems for decentralized systems**
If application servers are installed decentralized, a “shared” file system must be installed, for example Network File System (NFS).

**AIX: C++ Runtime environment**
Minimal C++ runtime requirements for the specific SAP Kernel releases are listed in SAP Note 1780629.

**Linux: C compiler**
Make sure that the C compiler gcc is installed.

### 3.5 Planning User and Access Management

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

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

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

#### i Note

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

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

To specify the initial data source of the User Management Engine (UME), proceed as described in Specifying the Initial Data Source of the User Management Engine [page 103].

More Information

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</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="Security" /></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td><img src="http://help.sap.com/nw73" alt="User Management of SAP NetWeaver AS for Java" /></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td><img src="http://help.sap.com/nw73" alt="User Management of SAP NetWeaver AS for Java" /></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
  ○ JCE Unlimited Strength Jurisdiction Policy files archive (only prompted if you install Adobe Document Services)
  ○ SAP system profile directory – only for systems with instances on separate hosts
  ○ User Management Engine (UME) Configuration

  **Note**

  If you want to install an optional standalone unit - Advanced Adapter Engine (AAE), Advanced Adapter Engine Extended (AEX), or Process Integration and Orchestration (PI-CP) - you are not prompted for UME Configuration. Instead, optional standalone units are automatically configured.
to store the SAP system users in the Java database (see also section User Management Engine Parameters in SAP System Parameters [page 48]).

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

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

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

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

### Related Information

- SAP System Parameters [page 48]
- SAP System Database Parameters [page 58]
- Parameters for Additional Components to be Included in the SCS Instance (Optional) [page 58]

### 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>A Java standalone system is always a Unicode system.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SAP System ID</td>
<td>The SAP system ID (&lt;SAPSID&gt;) identifies the entire SAP system. The installer prompts you for the &lt;SAPSID&gt; when you execute the first installation option to install a new SAP system. If there are further installation options to be executed, the installer prompts you for the profile directory. For more information, see the description of the parameter SAP System Profile Directory.</td>
</tr>
</tbody>
</table>

**Example**

This prompt appears when you install the SCS 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.

**Example**

If you have already installed an ABAP system and you want to install a new Java system on the same host, make sure that you enter a <SAPSID> that is different from the <SAPSID> of the existing ABAP system. The <SAPSID> of a Java stack can only be equal to the <SAPSID> of an ABAP stack if they form a dual-stack system.

Dual stack is no longer supported in SAP systems based on SAP NetWeaver 7.5 or higher.

- 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>
<tbody>
<tr>
<td><strong>SAP System Instance Numbers</strong></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>To find out instance numbers of SAP systems that already exist on the installation host, look for subdirectories ending with <code>&lt;Instance Number&gt;</code> of local (not mounted) <code>/usr/sap/&lt;SAPSID&gt;</code> directories.</td>
</tr>
<tr>
<td></td>
<td>For more information about the naming of SAP system instances, see SAP Directories [page 71].</td>
</tr>
<tr>
<td><strong>Caution</strong></td>
<td>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&lt;Instance Number&gt;. The NIM client daemon uses reserved ports 3901 and 3902.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>HP-UX only: Do not use 75 for the instance number because this number is already used by the operating system. For more information, see SAP Note 29972.</td>
</tr>
<tr>
<td><strong>Virtual Host Name</strong></td>
<td>Virtual host name (network name) of the SAP&lt;SAPSID&gt; cluster group</td>
</tr>
<tr>
<td></td>
<td>You can assign a virtual host name to an SAP instance in one of the following ways:</td>
</tr>
<tr>
<td></td>
<td>● You can assign a virtual host name for the instance to be installed, by specifying it in the <code>&lt;Instance Name&gt; Host Name</code> field of the <code>&lt;Instance Name&gt; Instance</code> screen. Then this instance is installed with this virtual host name.</td>
</tr>
<tr>
<td></td>
<td>● Alternatively you can assign virtual host names also by starting the installer with the <code>SAPINST_USE_HOSTNAME</code> property. For more information, see Running the Installer [page 107].</td>
</tr>
<tr>
<td></td>
<td>After the installation has completed, all application servers can use this virtual host name to connect to the instance. If you do not provide the virtual host name, the instance is installed automatically using the physical host name of the host where you run the installer.</td>
</tr>
<tr>
<td></td>
<td>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 79].</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>Fully qualified host names, IPv4, IPv6 are not accepted as virtual host names.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SAP System Profile Directory</td>
<td>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/profile or /usr/sap/&lt;SAPSID&gt;/SYS/profile</td>
</tr>
<tr>
<td></td>
<td>The installer retrieves parameters from the SAP system profile directory of an existing SAP system.</td>
</tr>
<tr>
<td></td>
<td>SAP profiles are operating system files that contain instance configuration information.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>See also the description of the parameters SAP System ID and Database ID.</td>
</tr>
<tr>
<td></td>
<td>/usr/sap/&lt;SAPSID&gt;/SYS/profile is the soft link referring to /&lt;sapmnt&gt;/&lt;SAPSID&gt;/profile.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Master Password</td>
<td>Common password for all users that are created during the installation:</td>
</tr>
<tr>
<td></td>
<td>- Operating system users (for example <code>&lt;sapsid&gt;adm</code>)</td>
</tr>
<tr>
<td></td>
<td>□ Caution</td>
</tr>
<tr>
<td></td>
<td>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>- Java users</td>
</tr>
<tr>
<td></td>
<td>(for example Administrator)</td>
</tr>
<tr>
<td></td>
<td>- Secure Store key phrase</td>
</tr>
<tr>
<td></td>
<td>SAP systems based on SAP NetWeaver lower than 7.4: For more information, see line Key Phrase for Secure Store Settings in this table.</td>
</tr>
<tr>
<td></td>
<td>□ Caution</td>
</tr>
<tr>
<td></td>
<td>The installer applies the master password to users SAP* and DDIC for SAP system clients 000 and 001 only, but not to users SAP*, DDIC, and EARLYWATCH in SAP system client 066.</td>
</tr>
<tr>
<td></td>
<td>Instead, the installer always assigns the following passwords to these users in client 066:</td>
</tr>
<tr>
<td></td>
<td>SAP*: 06071992</td>
</tr>
<tr>
<td></td>
<td>EARLYWATCH: support</td>
</tr>
<tr>
<td></td>
<td>See also Ensuring User Security.</td>
</tr>
<tr>
<td>Basic Password policy</td>
<td>The master password must meet the following requirements:</td>
</tr>
<tr>
<td></td>
<td>- It must be 8 to 14 characters long</td>
</tr>
<tr>
<td></td>
<td>- It must contain at least one letter (a-z, A-Z)</td>
</tr>
<tr>
<td></td>
<td>- It must contain at least one digit (0-9)</td>
</tr>
<tr>
<td></td>
<td>- It must not contain \ (backslash) or &quot; (double quote).</td>
</tr>
<tr>
<td>Additional restrictions depending on SAP Adaptive Server Enterprise:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- It must be at least 6 characters long</td>
</tr>
<tr>
<td></td>
<td>- It can only contain the following characters: a-zA-Z, 0-9, &lt;space&gt;, !#$%&amp;'()++,-./:&lt;=&gt;?^_`{</td>
</tr>
<tr>
<td></td>
<td>Depending on the installation option, additional restrictions may apply.</td>
</tr>
<tr>
<td>Example</td>
<td>The master password must not contain the name of a Java user created during the installation.</td>
</tr>
</tbody>
</table>
### Parameter | Description
--- | ---
Message Server Access Control List | You can specify if you want to have a message server Access Control List (ACL) created. The ACL is created as a file in the `/<sapmnt>/<SAPSID>/global` directory. If it exists, it defines the hosts from which the message server accepts requests.

⚠️ **Caution**

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.

For more information, see the information about `ms/acl_info` in SAP Notes 1495075 and 826779.

Java(TM) Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files Archive | If you want to install Adobe Document Services, make sure that you download the unlimited version of the JCE Jurisdiction Policy Files archive. For more information about where to download it, see SAP Note 1240081.

Key Phrase for Secure Store Settings | This is a random word or phrase that is used to encrypt the secure store. The Java EE engine uses this phrase to generate the key that is used to encrypt the data. The uniqueness of the phrase you use contributes to the uniqueness of the resulting key.

→ **Recommendation**

Use a long key phrase that cannot be guessed easily. Use both uppercase and lowercase letters in the phrase and include special characters.

→ **Note**

If you choose Typical mode, the installer sets the master password for the key phrase. In this case, make sure that you replace the master password with the required unique key phrase either on the Parameter Summary screen or after the installation has finished.
### DNS Domain Name for SAP System

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:

<Host_Name>.<Domain_Name>

The DNS Domain Name is needed to define the URLs for the Java application servers. It is appended to the server name to calculate the FQDN.

For more information, see SAP Note [654982](#).

**Example**

If your application server host is called `kirk.wdf.sap.com`, the DNS Domain Name is `wdf.sap.com`.

### SAP Host Agent Upgrade (Optional)

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<Version>.SAR` archive.

For more information, see [Downloading SAP Kernel Archives (Archive-Based Installation)](#) [page 87].

### Ports

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| Java Message Server Port | **Caution**<br>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.  

The SCS instance profile contains the configuration for the Java message server.  

The Java message server port uses the parameter `rdisp/msserv_internal` with default value `39<SCS_Instance_Number>`.  

For more information about the parameters used for message server ports, see SAP Note [821875](#). |
### 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</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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 Define Parameters phase of the installer, you can specify that the operating system users are to be removed automatically from the</td>
</tr>
<tr>
<td></td>
<td>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 66].</td>
</tr>
<tr>
<td></td>
<td>For more information about the <code>sapinst_instdir</code> directory, see Useful Information about the Installer [page 113].</td>
</tr>
</tbody>
</table>

### User Management Engine Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Using the Java Database:</strong></td>
<td></td>
</tr>
<tr>
<td>Administrator User</td>
<td>The installer sets the user name <code>Administrator</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>
<tr>
<td>Guest User</td>
<td>The installer sets the user name <code>Guest</code> and the master password by default.</td>
</tr>
<tr>
<td></td>
<td>The guest user is a user for anonymous access.</td>
</tr>
</tbody>
</table>

### Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise

Planning
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server Instance Number</td>
<td>This is the instance number on the application server of the central ABAP system to which you want to connect the Application Server Java.</td>
</tr>
<tr>
<td></td>
<td>To find out the number on the host of the primary application server instance, look in the following SAP directory:</td>
</tr>
<tr>
<td></td>
<td>- SAP systems based on SAP NetWeaver 7.1 to 7.4: /usr/sap/&lt;SAPSID&gt;/DVEBMGS&lt;Instance_Number&gt;</td>
</tr>
<tr>
<td></td>
<td>- SAP systems based on SAP NetWeaver 7.5: /usr/sap/&lt;SAPSID&gt;/D&lt;Instance_Number&gt;</td>
</tr>
<tr>
<td>Application Server Host</td>
<td>This is the host name of the relevant application server instance.</td>
</tr>
<tr>
<td></td>
<td>To find out the host name, enter hostname at the command prompt of the host running the primary application server instance.</td>
</tr>
<tr>
<td>Communication User</td>
<td>This is the name and password of the existing ABAP communication user. You must have created this user manually on the external ABAP system.</td>
</tr>
<tr>
<td></td>
<td>The default user name is SAPJSF</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong></td>
</tr>
<tr>
<td></td>
<td>If you are installing a SAP NetWeaver 7.5 Process Integration (PI) or a SAP Solution Manager 7.2 system, this user has been created during the installation of the SAP NetWeaver 7.5 PI application server ABAP.</td>
</tr>
<tr>
<td>Using an External ABAP System – Parameters for the Application Server Java Connection:</td>
<td></td>
</tr>
<tr>
<td>Administrator User</td>
<td>This is the name and password of the administrator user that you created on the external ABAP system.</td>
</tr>
<tr>
<td></td>
<td>The default user name is J2EE_ADMIN</td>
</tr>
<tr>
<td></td>
<td><strong>i Note</strong></td>
</tr>
<tr>
<td></td>
<td>If you are installing a SAP NetWeaver 7.5 Process Integration (PI) or a SAP Solution Manager 7.2 system, this user has been created during the installation of the Application Server ABAP.</td>
</tr>
<tr>
<td>Administrator Role</td>
<td>The role SAP_J2EE_ADMIN must exist on the external ABAP system.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Guest User</td>
<td>This is the name and password of the guest user that you created on the external ABAP system. The guest user is a user for anonymous access. The default user name is <code>J2EE_GUEST</code>.</td>
</tr>
<tr>
<td>Note</td>
<td>If you are installing a SAP NetWeaver 7.5 Process Integration (PI) or an SAP Solution Manager 7.2 system, this user has been created during the installation of the Application Server ABAP.</td>
</tr>
<tr>
<td>Guest Role</td>
<td>The role <code>SAP_J2EE_GUEST</code> must exist on the external ABAP system.</td>
</tr>
</tbody>
</table>

**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. You can choose between the following options:</td>
</tr>
</tbody>
</table>
|                                               | • **Register in existing SLD**  
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. |
|                                               | • **No SLD destination**  
Choose this option if you do not want to register the SAP system you are installing in an existing SAP System Landscape Directory (SLD). You then have to configure the SLD destination manually after the installation has finished. |
| SLD Host                                      | The host name of the existing SLD.                                                                                                                                                                    |
| SLD HTTP(S) Port                             | HTTP port of the SAP system based on AS Java on which the System Landscape Directory (SLD) resides. The following naming convention applies:  
5<Primary_Application_Server_Instance_Number>00. |
| SLD Data Supplier User and password          | The existing SLD Data Supplier user and password of the existing SLD.                                                                                                                                |
3.6.2 SAP System Database Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database ID &lt;DBSID&gt;</td>
<td>The &lt;DBSID&gt; identifies the database instance. The installer prompts you for the &lt;DBSID&gt; when you are installing the database instance. The &lt;DBSID&gt; can be the same as the &lt;SAPSID&gt;.</td>
</tr>
<tr>
<td></td>
<td>△ Caution</td>
</tr>
<tr>
<td></td>
<td>Choose your database ID carefully. Renaming is difficult and requires you to reinstall the SAP system.</td>
</tr>
<tr>
<td></td>
<td>• If you want to install a new database:</td>
</tr>
<tr>
<td></td>
<td>Make sure that your database ID:</td>
</tr>
<tr>
<td></td>
<td>○ Is unique throughout your organization</td>
</tr>
<tr>
<td></td>
<td>○ Consists of exactly three alphanumeric characters</td>
</tr>
<tr>
<td></td>
<td>○ Contains only uppercase letters</td>
</tr>
<tr>
<td></td>
<td>○ Has a letter for the first character</td>
</tr>
<tr>
<td></td>
<td>○ Does not include any of the reserved IDs listed in SAP Note 1979280</td>
</tr>
<tr>
<td>Java Database User (SAPSR3DB)</td>
<td>The user name corresponds to the owner of the database tables.</td>
</tr>
<tr>
<td>Database user for database system administration (sapsa)</td>
<td>This is the default user for database monitoring and administration.</td>
</tr>
<tr>
<td>Database user for database system security tasks (sapsso)</td>
<td>This is the default user for security relevant tasks such as user creation and password setup.</td>
</tr>
</tbody>
</table>

3.6.3 Parameters for Additional Components to be Included in the SCS Instance (Optional)

You only need to specify the following parameters during the SCS instance installation if you perform an integrated installation of additional components.
Parameters | Description
--- | ---
Install an SAP Web Dispatcher integrated in the SCS 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 SCS Instance.

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

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

SCS Instance with Integrated SAP Web Dispatcher [page 25]

3.7 Setup of Database Layout

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

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

To ensure that your SAP system performs well in a production environment, you have to create separate file systems manually for the directories listed in the following table before you start the installer. The file systems must have the permission value 750, the owner `syb<dbsid>`, and the group `sapsys`.

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

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

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

<table>
<thead>
<tr>
<th>File System / Logical Volume:</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/sybase/&lt;DBSID&gt;</code></td>
<td>SAP ASE software ($SYBASE)</td>
</tr>
<tr>
<td></td>
<td>Size: at least 6 GB</td>
</tr>
<tr>
<td><code>/sybase/&lt;DBSID&gt;/sybsystem</code></td>
<td>Location for devices <code>master.dat</code>, <code>sybmgmtdb.dat</code>, <code>sybsysdb.dat</code>, <code>sysprocs.dat</code></td>
</tr>
<tr>
<td></td>
<td>Size: at least 1 GB</td>
</tr>
<tr>
<td><code>/sybase/&lt;DBSID&gt;/sybtemp</code></td>
<td>Location for device tempdb</td>
</tr>
<tr>
<td></td>
<td>Size: at least 4 GB</td>
</tr>
<tr>
<td><code>/sybase/&lt;DBSID&gt;/saptemp</code></td>
<td>Location for device saptempdb</td>
</tr>
<tr>
<td></td>
<td>Size: at least 6 GB</td>
</tr>
<tr>
<td><code>/sybase/&lt;DBSID&gt;/sapdiag</code></td>
<td>Location for devices containing the database <code>saptools</code>.</td>
</tr>
<tr>
<td></td>
<td>Size: at least 5 GB</td>
</tr>
<tr>
<td><code>/sybase/&lt;DBSID&gt;/sapdata_&lt;n&gt;</code></td>
<td>Location for devices containing data</td>
</tr>
<tr>
<td></td>
<td>For more information, see SAP Note 1748888</td>
</tr>
<tr>
<td><code>/sybase/&lt;DBSID&gt;/saplog_&lt;n&gt;</code></td>
<td>Location for devices containing logs</td>
</tr>
<tr>
<td></td>
<td>For more information, see SAP Note 1748888</td>
</tr>
<tr>
<td><code>/sybase/&lt;DBSID&gt;/sybsecurity</code></td>
<td>Location for devices containing the database <code>sybsecurity</code></td>
</tr>
<tr>
<td></td>
<td>Size: at least 1 GB</td>
</tr>
</tbody>
</table>

For information about SAP file systems, see [SAP Directories](#) [page 71].
3.8 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 100].

More Information

- Required File Systems and Directories [page 71]

3.9 Planning the Switchover Cluster for High Availability

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

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

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

Switchover clusters also have the advantage that you can deliberately initiate switchover to release a particular node for planned system maintenance. Switchover solutions can protect against hardware failure and operating system failure but not against human error, such as operator errors or faulty application software. Additional downtime might be caused by upgrading your SAP system or applying patches to it.

Without a switchover cluster, the SAP system SPOFs – central services instance, the database instance, and the central file share – are vulnerable to failure because they cannot be replicated. All of these can only exist once in a normal SAP system.

You can protect software units that are not SPOFs against failure by making them redundant, which means simply installing multiple instances. For example, you can add additional application server instances. This
complements the switchover solution and is an essential part of building high availability (HA) into your SAP system.

→ Recommendation
We recommend switchover clusters to improve the availability of your SAP system.

A switchover cluster consists of:

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

Prerequisites

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

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

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

Features

i Note
The diagrams in this section are only examples. Only the instances relevant to the switchover are shown. These diagrams summarize the overall setup and do not show the exact constellation for an installation based on one of the available technologies.

You need to discuss your individual HA setup with your HA partner.
Switchover Setup
Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise
Planning
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

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

1. You check that the required operating system users and groups [page 66] are created.
2. You set up file systems [page 71] 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 79]. 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 107]).
4. If you want to install a high-availability system, you perform switchover preparations [page 79].
5. If you want to share the transport directory trans from another system, export [page 100] this directory to your installation hosts.
6. If you need to configure the User Management Engine (UME) of Application Server Java for the user management of a separate ABAP system, you have to prepare user management for an external ABAP System [page 80].

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

7. You check that the required installation media [page 82] are available for each installation host.
8. If you decided to use a generic LDAP directory, you have to create a user for LDAP directory access [page 181].
9. You continue with Installation [page 95].

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 66] are created.
2. You set up file systems [page 71] 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 79]. 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 107]).
4. If you want to share the transport directory trans from another system, export [page 100] this directory to your installation hosts.
5. You check that the required installation media [page 82] are available on each installation host.
6. You continue with Installation [page 95].

4.2 Creating Operating System Users and Groups

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

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).

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** ➔ **Preparation** ➔ **Operating System Users and Groups**.
  For more information, see *Running the Installer [page 107]*.
- 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).

<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>
</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 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>

- 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, 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`.

- Only valid for 'Platform': HP-UX

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

End of 'Platform': HP-UX

### Operating System Users and Groups

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

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

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

> 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 137].

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 48].

<table>
<thead>
<tr>
<th>User:</th>
<th>Primary Group:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIX superuser root</td>
<td>No primary group assigned by SAPinst (group sapinst is assigned as secondary group).</td>
</tr>
<tr>
<td>User:</td>
<td>Primary Group:</td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
</tr>
<tr>
<td>SAP system administrator <code>&lt;sapsid&gt;</code>adm</td>
<td>sapsys (sapinst as secondary group)</td>
</tr>
</tbody>
</table>

```
syb<dbsid>
```

**i Note**

Only used on the database host.

---

### 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>

**i Note**

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

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

**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>
4.3  Required File Systems and Directories

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

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>The installation of any SAP system does not require a special file system setup or separate partitions.</td>
</tr>
</tbody>
</table>

Related Information

SAP Directories [page 71]
Setting Up File Systems for a High-Availability System [page 75]

4.3.1  SAP Directories

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

The installer creates the following types of directories:
- Physically shared directories
- Logically shared directories
- Local directories

Only valid for 'Platform': HP-UX

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

End of 'Platform': HP-UX

Directories of the SAP System

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

Contact your HA partner for their recommendation. For more information, see Setting Up File Systems for a High-Availability System [page 75].

The installer prompts you only for the `<sapmnt>` directory during the installation.
The following figure shows the directory structure of the SAP system:

**Directory Structure for a Java System**

A Java standalone system is always a Unicode system (directory uc – Unicode).

**Physically Shared Directories (SAP System)**

Physically shared directories reside on the global host and are shared by Network File System (NFS). The 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 101]):

- **/global**: Contains globally shared data
- **/profile**: Contains the profiles of all instances
- **/exe**
Contains executable kernel programs. The kernel programs are replicated from directory `<sapmnt>/<SAPSID>/exe/uc/<platform>` to the `exe` directories of each Unicode system instance.

- The directory `/usr/sap/trans`, 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.

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

For more information about the global transport directory, see Exporting and Mounting the Global Transport Directory [page 100].

### Physically Shared SAP Directories

<table>
<thead>
<tr>
<th>Directory</th>
<th>Required Minimum Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;sapmnt&gt;/&lt;SAPSID&gt;</code></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`

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

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

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

The 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:
  - The directory of an application server instance (primary application server instance and additional application server instance) is called `J<Instance_Number>`.
  - The directory of the central services instance (SCS) instance is called `SCS<Instance_Number>`.
  - The directory of an ERS instance is called `ERS<Instance_Number>`.

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

Local SAP Directories

<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;/J&lt;Instance Number&gt;</code></td>
<td>Application server instance directory (primary application server instance or additional application server instance)</td>
<td>Minimum 5 GB for the AS Java + up to 2 GB for each additional &quot;product instance&quot; (SAP systems based on SAP NetWeaver lower than 7.3 EHP1: &quot;usage type&quot; or &quot;software unit&quot;) you want to install</td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/SCS&lt;Instance Number&gt;</code></td>
<td>Java central services instance (SCS instance) directory</td>
<td>Minimum 2 GB</td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/ERS&lt;Instance Number&gt;</code></td>
<td>ERS instance directory for the SCS instance (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

4.3.2 Setting Up File Systems for a High-Availability System

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

Prerequisites

You have already installed the hardware – that is, hosts, disks, and network – and decided how to distribute the database, SAP instances, and – if required – Network File System (NFS) server over the cluster nodes (that is, over the host machines). For more information, see Planning the Switchover Cluster [page 61] and contact your HA partner.

Context

From the perspective of an SAP application, there are the following types of SAP Directories [page 71]:

- Physically shared directories: /<sapmnt>/<SAPSID> and /usr/sap/trans
  In an HA setup, /<sapmnt> should be a highly available file system, and /usr/sap/trans should be a shared file system.

- Logically shared directories that are bound to a node such as /usr/sap with the following local directories:
  - /usr/sap/<SAPSID>
  - /usr/sap/<SAPSID>/SYS
  In an HA Setup, no special actions are required for these local directories.

- Local directories that contain the SAP instances, such as /usr/sap/<SAPSID>/SCS<Instance Number>
  In an HA setup, the directories of the clustered instances (/usr/sap/<SAPSID>/<Instance Type><Instance Number>) should be mounted as cluster-controlled file systems and reside on highly available file systems.

Only valid for 'Platform': HP-UX

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

End of 'Platform': HP-UX

Procedure

1. Create the file systems or raw partitions for the SAP instances you can switch over in such a way that the content can be made available to all nodes that can run the service.

   At least the central services (SCS) instance and the ERS instance must be part of the switchover cluster

   The SAP directories /<sapmnt>/<SAPSID> and /usr/sap/trans are usually mounted from a Network File System (NFS). Especially for /<sapmnt>/<SAPSID> you should think of using a highly available file system. However, an SAP instance directory /usr/sap/<SAPSID>/<Instance Type><Instance
that you want to prepare for HA must always be mounted on the cluster node that is currently running the instance.

⚠️ Caution

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

- Make the physically shared SAP directories under `/<sapmnt>/<SAPSID>` available to the server beforehand.
- Consult your HA partner to clarify the best solution for the cluster software.

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

   The `/usr/sap/<SAPSID>` directory contains at least two subdirectories (see also [SAP Directories](#page 71)):

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

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

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

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

     i Note

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

3. You assign the local (not switching) file systems to permanent mount points.

4. You assign the shared file systems as documented by your HA partner.

💡 Example

The graphic below shows a scenario of the file systems and disks in an HA setup with an integrated NFS server. Such a setup is not mandatory. For more information about a setup that meets your needs, consult your HA partner.
Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise

Preparation

File Systems and Disks in an HA Setup

Local Disks – Node A
- usr
- sap
- sapmnt
- <SAPSID>
- SYS
  - global
  - profile
  - exe

Shared Disks
- <SAPSID>
  - global
  - profile
  - exe

Local Disks – Node B
- usr
- sap
- sapmnt
- <SAPSID>
- SYS
  - global
  - profile
  - exe

ERS
- log
- data
- exe

SCS
- work
- log
- data
- exe

PAS
- j2ee
- exe
- work

AAS
- j2ee
- exe
- work

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

Node A fails
Node B fails
4.4 Using Virtual Host Names

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

Prerequisites

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

Context

If you want to install a high-availability (HA) system [page 21], you need the virtual host name when you install the SCS instance in a cluster.

Procedure

Proceed as described in SAP Note 962955. Assign the required virtual host names to the instance to be installed by specifying them in the `<Instance_Name> Host Name` field of the `<Instance_Name> Instance` screen while running the installer.

For more information, see the Virtual Host Name parameter description in SAP System Parameters [page 48].

4.5 Performing Switchover Preparations for High Availability

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

Context

To be able to use the required virtual host names [page 79], 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 in the `<Instance_Name> Host Name` field of the `<Instance_Name> Instance` screen.

For more information, see Virtual Host Name in SAP System Parameters [page 48].
**Procedure**

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

**Note**

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

**4.6 Preparing an External ABAP System as Source for User Data**

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

**Prerequisites**

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

**Context**

**Note**

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

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

**Note**

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

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

Recommendation
For security reasons, we recommend the first approach.

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

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

<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><a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></td>
<td>SAP NetWeaver Library: Function-Oriented View</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Security</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td>User Management</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td>Configuring</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td>User Management of SAP NetWeaver AS for Java</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td>UME Data Sources</td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.51 innovation package</td>
<td>User Management of Application Server ABAP as Data Source</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>

Procedure

- The following procedures describe the activities you have to perform in the existing ABAP system and for the Java system to be installed.
- Perform the following steps in the existing ABAP system:
  a. Call transaction PFCG to do the following:
○ Check that the roles `SAP_BC_JSF_COMMUNICATION` and `SAP_BC_JSF_COMMUNICATION_RO` exist and make sure that their profiles are generated.

○ Check that the roles `SAP_J2EE_ADMIN`, `SAP_J2EE_GUEST`, and `SAP_BC_FP_ICF` exist. Neither role contains any ABAP permissions, so you do not need to generate any profiles.

b. Call transaction SU01 to do the following:

○ Create a new communication user and assign it to the role `SAP_BC_JSF_COMMUNICATION_RO`. We recommend that you do the following:
  ○ Name this user `SAPJSF`. You can use any password.
  ○ Assign this user the role `SAP_BC_JSF_COMMUNICATION_RO` for read-only (display) access to user data with Java tools. If you intend to maintain user data (that is, to change, create, or delete users) with Java tools, you need to assign the role `SAP_BC_JSF_COMMUNICATION` instead.
  ○ Assign this user the type `Communications` under `Logon data` to make sure that it can only be used for communication connections between systems and not as a dialog user.

○ Create a new administrator user for the J2EE engine and assign it to role `SAP_J2EE_ADMIN`. We recommend that you name this user `J2EE_ADMIN_<SAPSID_Java_System>`. You can use any password.

○ Create a new guest user for the J2EE engine and assign it to role `SAP_J2EE_GUEST`. We recommend that you name this user `J2EE_GUEST_<SAPSID_Java_System>`. You can use any password.

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

c. Make sure that you change the initial passwords of these users and take the precautions described in the relevant SAP security guide before you start the installation of the Java system. You can find the security guide in the Security section of the product page for your SAP product at https://help.sap.com/.

• Perform the following steps in the Java System:

  a. **Before** the installation of the Java system, make sure that you have the correct user names and passwords of the users listed above for the separate ABAP system.

  b. **During** the installation of the Java system, make sure that you enter the correct users and passwords in the corresponding installer dialogs.

### 4.7 Preparing the Installation Media

This section describes how to prepare the installation media.

Installation media are available as follows:

- The Software Provisioning Manager 1.0 archive containing the installer
  You always have to download the latest version of the Software Provisioning Manager 1.0 archive. For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 86].

- The media containing the software to be installed. These are the following:
  ○ Kernel media:
You can make them available in one of the following ways:

- Download the specific **kernel archives** from the SAP Software Center - this is the recommended way.
- Download the **SAP kernel archives** (SAR files) from the SAP Software Center.
  If you are performing an Installation Using a Stack Configuration File [page 31], you can directly download the artefacts (SAR archives) as specified in the Maintenance Plan.
- Use the physical installation media as part of the installation package.
- Download the complete kernel media from the SAP Software Center.
- **RDBMS and export media.**
  You can make them available in one of the following ways:
  - Use the physical installation media as part of the installation package.
  - Download the complete kernel media from the SAP Software Center.

For detailed information about how to obtain these media, see **Media Required for the Installation - Listed by SAP System Instance [page 83]**.

### Related Information

- Media Required for the Installation - Listed by SAP System Instance [page 83]
- Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 86]
- Downloading SAP Kernel Archives (Archive-Based Installation) [page 87]
- Downloading Software Packages for a Maintenance Planner Transaction [page 91]
- Downloading Complete Installation Media [page 93]

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

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

The signature of **installation 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 107]). The installer only accepts media whose signature has been checked. For more information, see SAP Note 2393060.

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](http://support.sap.com/pam). Proceed as follows to make the media available:

1. Identify the required media for your installation [page 19] as listed below.
   Every installation of an SAP system on SAP Adaptive Server Enterprise is Unicode.
2. Make the installation media available on each installation host as follows:

1. Download and unpack the latest version of Software Provisioning Manager as described in Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 86].

2. Make the kernel media available.
   You can do this in one of the following ways:
   ○ Download the dedicated kernel archives - this is the recommended way.
   For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 87].

   **Note**
   If you are using a stack configuration file (see Installation Using a Stack Configuration File [page 31]), you have the installation media defined when generating the Landscape Plan. The media link provided in the Landscape Plan guides you to the location in the SAP Software Download Center at https://launchpad.support.sap.com/#/softwarecenter where you can...
download the installation media required for your SAP product, operating system and database.

Using the installer, you can also directly download the artefacts (SAR archives) as specified in the Maintenance Plan. For more information, see **Downloading Software Packages for a Maintenance Planner Transaction** [page 91].

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

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

- Download the kernel medium from the Software Download Center.
  For more information, see **Downloading Complete Installation Media** [page 93].

**Note**
Even if you use the complete 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](https://launchpad.support.sap.com/#/softwarecenter) following the instructions in **Downloading SAP Kernel Archives (Archive-Based Installation)** [page 87].

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

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

⚠️ **Caution**
If you copy the media to disk, make sure that the paths to the destination location of the copied media do not contain any blanks.
4.7.1.1 Downloading and Extracting the Software Provisioning Manager 1.0 Archive

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

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 System 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.

   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 -tVf <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 -R <Path to Unpack Directory>
```

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

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

### 4.7.1.2 Downloading SAP Kernel Archives (Archive-Based Installation)

Instead of downloading the complete SAP kernel media, we recommend that you download the SAP kernel archives specifically required for your installation option. During the installation, you can either specify the path to each archive separately, or provide the path to a download basket with all downloaded archives.

```
i Note
If you are performing an installation using a stack configuration file, you can use the service Downloading Software Packages for a Maintenance Planner Transaction [page 91].
```

### Context

The signature of installation archives is checked automatically by the installer [page 107] 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 86].
2. Go to 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 SAP S/4HANA <Release> Java, choose SAP NetWeaver and complementary
     products  SAP NETWEAVER  SAP NETWEAVER 7.5  Application Server Java
   ○ If you want to install SAP NetWeaver Composition Environment 7.1 or 7.2, choose SAP NetWeaver
     and complementary products  SAP NETWEAVER CE 7.1X  <Release>  Entry by Component
   ○ If you want to install an SAP NetWeaver Java system or optional standalone unit, choose SAP
     NetWeaver and complementary products  SAP NetWeaver  <Release>  [For releases lower than
     7.5: Entry by Component]  Application Server Java
   ○ If you want to install an SAP Business Suite system based on SAP NetWeaver, choose SAP
     Application Components  <SAP CRM | SAP ERP | SAP SCM | SAP SRM>  <Release>  Entry
     by Component  <Java Product Instance>
4. Choose the required package:

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

   △ 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 7.49, then SAPEXEDB<Version>.SAR must also
     be of version 7.49.
If SAPEXE<Version>.SAR is of version 7.45, then SAPEXEDB<Version>.SAR must also be of version 7.45.
If SAPEXE<Version>.SAR is of version 7.42 EXT, then SAPEXEDB<Version>.SAR must also be of version 7.42 EXT.

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 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> <UC> <Operating System> <DATABASE>.

igsexec<Version>.sar

- **SAP IGS <Version> <Operating System> # OS independent**
  - 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 7.20_EXT #OS independent.
  - If you want to install an SAP system based on SAP NetWeaver 7.3 or lower and use SAP kernel 7.21_EXT, choose SAP IGS 7.20_EXT <Operating System>.
  - If you want to install an SAP system based on SAP NetWeaver 7.3 or lower and use SAP kernel 7.21, choose SAP IGS 7.20 <Operating System>.

igshelper<Version>.sar

- If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1 or higher, choose SAP IGS HELPER #OS independent.
- If you want to install an SAP system based on SAP NetWeaver 7.3 or lower, choose SAP IGS 7.20 <Operating System>.
SAP JVM<Version>.SAR:

- If you want to install an SAP system based on SAP NetWeaver 7.5 or higher, choose SAP JVM 8.1.<Version> <Select Your Operating System>
- If you want to install an SAP system based on SAP NetWeaver 7.4 or lower, choose SAP JVM 6.1.<Version> <Select Your Operating System>

SAP HOSTAGENT<Version>.SAR

**Recommendation**

It is highly recommended that you always choose the highest SP version of the SAPHOSTAGENT<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:

   https://launchpad.support.sap.com/#/softwarecenter Support Packages and Patches By Category Additional Components SAPCRYPTOLIB COMMONCRYPTOLIB<Version> <Operating System>

6. If you want to install Adobe Document Services, download the unlimited version of the JCE Jurisdiction Policy Files archive. For more information about where to download it, see SAP Note 1240081 (see also SAP System Parameters [page 48]).

7. Make the RDBMS and the export media available - either by using physical media as described in Media Required for the Installation - Listed by SAP System Instance [page 83] or by downloading them as described in Downloading Complete Installation Media [page 93].

**Related Information**

Downloading Software Packages for a Maintenance Planner Transaction [page 91]
4.7.1.3 Downloading Software Packages for a Maintenance Planner Transaction

Software Provisioning Manager (the installer) is now enabled to download all software packages that have been defined in a Maintenance Planner Transaction.

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

**Prerequisites**

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

**Procedure**

1. Specify a download directory for the artifacts (SAP archives) to be downloaded.
2. Start the installer as described in Running the Installer [page 107].
3. On the **Welcome** screen, choose **Generic Options** > **Download Software Packages for Maintenance Planner Transaction**.
4. Follow the instructions on the installer screens.

   The installer prompts you for the following input parameters:
   - **Maintenance Planner Transaction ID**
     You can find the Maintenance Planner Transaction ID by one of the following ways:
     - In the `MP_Plan_<Transaction ID>_<Generation Date>_.pdf` file which you can download during the **Completed** step in the Maintenance Planner by choosing the **Download PDF** button.
     - From the **Transaction ID** column in the list of transactions displayed in the **Transactions** panel in the maintenance planner.
     - From the parameter `mopz-transaction-id` in the stack configuration file `MP_Stack_<Transaction ID>_<Generation Date>_.xml` which you can download during the **Download Files** step in the Maintenance Planner by choosing the **Download Stack XML** button.
   - **Your S-UserID and password**
     You call **Software Provisioning Manager** with command line parameter `SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>` to get the **Maintenance Planner Transaction ID** extracted from the stack configuration file.

**Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise**
You must perform this option directly after creating the Maintenance Planner Transaction, because the contained download links usually expire soon.

Ensure the following for your S-User:

1. You have download permissions for all artifacts on https://launchpad.support.sap.com/#/softwarecenter to be able to download them.

2. Consider the SAP Support Portal and the SAP ONE Support Launchpad password policies. Your password must be the same for both of them. If the passwords are not the same, you will lock the S-User in the SAP Support Portal. The password must meet all of the following requirements:
   - Must be exactly eight characters long
   - Contains at least one upper-case letter (A-Z)
   - Contains at least one lower-case letter (a-z)
   - Contains at least one decimal digit (0-9)
   - Contains at least one of the following special characters: ! @ $ % / ( ] { } ) + - * = ? ' ~ # _ . , ; :
   - Must not start with ? or !
   - Must not contain any blanks
   - Must not begin with three identical characters
   - Must be different from the last five passwords you have already used
   - Only one password change is allowed per day


3. Location of download folder for the installation software packages to be downloaded

4. If you have a proxy configured in your network, provide the proxy host and port.

5. You get a list of all downloadable artifacts (SAP archives) as specified in the stack configuration file along with their file size.

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

6. Choose Next to start the download.

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

   - Create an up-to-date Maintenance Plan and perform again the download of the files which were not downloaded successfully. In case of an error, the installer skips the download of the artifact (SAR archive) in question and continue with the next one in the list.

   - Download the still missing files directly from the SAP Software Center at https://launchpad.support.sap.com/#/softwarecenter.

**Results**

You have downloaded the artifacts (SAP archives) required for your SAP system installation with Software Provisioning Manager (the installer) - corresponding to the archives listed in section Downloading SAP Kernel Archives (Archive-Based Installation) [page 87] - and for applying the required kernel and support packages using Software Update Manager (SUM) after the installation has completed.
SAP BW/4HANA 1.0 SR1 only: RDBMS and export media are not covered by this feature. You have to provide them either as physical media or download them from the SAP Software Center as described in Downloading Complete Installation Media [page 93].

4.7.1.4 Downloading Complete Installation Media

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

Procedure

1. Download and unpack the latest version of Software Provisioning Manager as described in Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 86].
2. Create a download directory on the host where you want to run the installer.
3. You identify the required media as listed in Media Required for the Installation - Listed by SAP System Instance [page 83].
4. Identify all download objects that belong to one medium according to one of the following:

   - Download path or location:
     - To download the complete kernel media, go to https://support.sap.com/sitoolset/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:
     - 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
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**

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

Standard System

**Note**

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

1. You check the prerequisites [page 104] and run the installer [page 107] to install the SAP system.

   **Note**

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

2. You continue with Post-Installation [page 121].

Distributed System

1. If you want to share the transport directory `trans` from another system, you have to mount [page 100] it from this system. Otherwise, we recommend that you share the `trans` directory that is created during the installation of the primary application server instance.

2. On the SCS instance host, you do the following:
   1. You check the prerequisites [page 104] and run the installer [page 107] to install the central services instance (SCS instance).
If you want to install an SCS instance with integrated SAP Web Dispatcher [page 25], you must choose the **Custom** parameter mode.

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

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

2. You export global directories [page 101] in `<sapmnt>/<SAPSID>` to the database and primary application server instance host.

3. **On the database instance host**, you do the following:
   1. You mount the global directories [page 101] in `<sapmnt>/<SAPSID>` that you exported from the SAP global host and – optionally – the `trans` directory that you exported [page 100] from the SAP transport host.
   2. You check the prerequisites [page 104] and run the installer [page 107] to install the database instance.

4. **On the primary application server instance host**, you do the following:
   1. You mount the global directories [page 101] in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
   2. You check the prerequisites [page 104] and run the installer [page 107] to install the primary application server instance.
   3. If you want to use the shared transport directory `trans` from another system, you also mount [page 100] this directory.

5. You continue with **Post-Installation** [page 121].

**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 79] and *Setting Up File Systems for a High Availability System* [page 75].

2. If you want to share the transport directory `trans` from another system, you have to mount [page 100] 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:
   1. You check the prerequisites [page 104] and run the installer [page 107] to install the SCS instance on the primary cluster node, **host A**. Use a virtual host name [page 79].

   **i Note**
   
   If you want to install an SCS instance with integrated SAP Web Dispatcher [page 25], you must choose the **Custom** parameter mode.

   When processing the screens for the SCS instance installation, you are prompted to mark the corresponding checkbox on the screen **Additional Components to be Included in the SCS Instance**.
If you mark the checkbox for SAP Web Dispatcher, you are prompted for the additional parameters required for the SAP Web Dispatcher installation on the subsequent screens.

2. You check the prerequisites [page 104] and run the installer [page 107] to install the ERS instance for the SCS instance on the primary cluster node, host A. Use a virtual host name [page 79].

3. You export global directories [page 101] 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 33] and it has all the necessary file systems [page 75], mount points, and (if required) Network File System (NFS).

5. You set up the user environment on the standby node, host B:
   - You use the same user and group IDs, and OS specific files (such as etc/services) as on the primary node.
   - You create the home directories of users and copy all files from the home directory of the primary node.

For more information about the required operating system users and groups, see Creating Operating System Users [page 66].

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

7. You repeat the following steps until you have finished installing the ERS instance on all nodes in the cluster:
   1. You perform the switchover to a node where you want to install the ERS instance for the SCS instance.
   2. You check the prerequisites [page 104] and run the installer [page 107] to install the ERS instance for the SCS instance on the standby node, host B.

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

   → Recommendation

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

   1. You make available the global directories in <sapmnt>/<SAPSID> from the switchover cluster infrastructure and – optionally – from the SAP transport host.
   2. You check the prerequisites [page 104] and run the installer [page 107] to install the database instance on the database instance host.

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

   i Note

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

   1. You mount the global directories [page 101] in <sapmnt>/<SAPSID> that you exported from the switchover cluster infrastructure.
   2. You check the prerequisites [page 104] and run the installer [page 107] to install the primary application server instance.
   3. If you want to use the shared transport directory trans from another system, you also mount [page 100] this directory (see above).
6. We recommend you to install additional application server (AS) instances to create redundancy. The AS instances are not a SPOF. Therefore, do not include these instances in the cluster.

7. You continue with Post-Installation [page 121].

**Graphical Overview**

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

![Graphical Overview](image)

**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 101] in `<sapmnt>/<SAPSID>` that you exported from the SAP system host.
   2. You check the prerequisites [page 104] and run the installer [page 107] to install the additional application server instance.
   3. You continue with Post-Installation [page 121].

**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 100] 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 101] in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
   2. You check the prerequisites [page 104] and run the installer [page 107] to install the additional application server instance.
   3. If you want to use the shared transport directory `trans` from another system, also mount [page 100] this directory.

4. You continue with Post-Installation [page 121].

### 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 100] 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 101] in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
   2. You check the prerequisites [page 104] and run the installer [page 107] 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 100] this directory.

4. You continue with Post-Installation [page 121].

### 5.2 Exporting and Mounting the Transport Directory

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

#### Context

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

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

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

**Procedure**

**Mounting the Transport Directory**

*a Note*

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

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

### 5.3 Exporting and Mounting Global Directories

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

**Prerequisites**

If you want to install the executables locally instead of sharing them, do not mount the exe directory with Network File System (NFS). Instead, create `<sapmnt>/<SAPSID>/exe` as a local directory (not a link) with a minimum of 1.5 GB free space.

**Context**

There is no need to create the directories before the installation when you install a primary application server instance. The global directories must be exported only if you install additional application server instances.
You install an optional standalone unit (Advanced Adapter Engine, Advanced Adapter Engine Extended, or Process Orchestration) distributed over several hosts. You decide that the host with the main instances (Java central services instance (SCS instance), primary application server instance, database instance) is the SAP global host. Before you install additional application server instances, you have to export the global directories from the SAP global host and mount them on the installation hosts for the remaining instances.

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

**Procedure**

- **Exporting and Mounting Global Directories for a Homogeneous Installation**
  a. Log on to the SAP global host as user `root` and export the following directories with read/write access for the `root` user to the host where you want to install the new instance:

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

  b. Log on to the host of the new instance that you want to install as user `root`.
  c. Create the following mount points and mount them from the SAP global host:

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

  **Caution**

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

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

  With a heterogeneous installation, the instances of an SAP system are installed on hosts with different UNIX operating systems. If you need information about the installation of application servers on Windows in a UNIX environment, see Heterogeneous SAP System Installations [page 182].

  **Note**

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

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

  a. Log on to the SAP global host as user `root` and export the following directories with `root` access to the host on which you want to install the new instance:
5.4 Specifying the Initial Data Source of the User Management Engine

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

Prerequisites

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

Procedure

Using the Database of AS Java

You install your SAP system as described in this installation guide. During the installation, you specify the Java database as data source for the User Management Engine (UME) (see SAP System Parameters [page 48]).

During the installation, the SAP system is automatically configured to use the Java database as data source for the UME.
After the installation has finished, you can still change the user management configuration. For more information, see Configuring User Management [page 137].

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 137].

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 (recommended)
    ○ Mozilla Firefox
    ○ Microsoft Edge
    ○ Microsoft Internet Explorer 11 or higher.
    Always use the latest version of these web browsers.
  ○ If you copy the SL 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.

⚠️ Caution

The installer uses a self-signed certificate, which is used temporarily only while the installer is running. This certificate is not trusted by the browser unless it is imported manually by the user running the installer. This behavior is intentionally designed in this way because - unlike ordinary public web servers - the installer has different usage patterns. You must configure your browser do trust the self-issued certificate of the installer after carefully performing the “thumbprint” verification described in Running the Installer [page 107]. For more information about adding trusted certificates, see the documentation of your browser.

For more information about the SL Common GUI, see Useful Information about the Installer [page 113].

- 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.

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise
The installer uses `csh` scripts during the installation to obtain the environment for user `<sapsid>adm`.
This is also true if user `<sapsid>adm` already exists from an earlier SAP system installation, and the shell of this user is not `csh`. Before you start the installer, execute the following command as user `<sapsid>adm` to make sure that the `csh` scripts are up-to-date:

```
/bin/csh -c "source /home/<sapsid>/adm/.cshrc;env"
```

- Make sure that your operating system does not delete the contents of the temporary directory `/tmp` or the contents of the directories to which the variables `TEMP`, `TMP`, or `TMPDIR` point, for example by using a `crontab` entry.
  Make sure that the temporary directory has the permissions 755.
- 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 113].`
- 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`
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>

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

```
SAPINSTHTTPS_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:

```
SAPINSTHTTP_PORT=<Free Port Number>
```

- If you want to perform the installation in unattended mode, see SAP Note 2230669 which describes an improved procedure using inifile.params.

### 5.6 Running the Installer

This section describes how to run the installer.

**Prerequisites**

For more information, see Prerequisites for Running the Installer [page 104].

**Context**

The installer 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 113].

**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.

   executable from the command line. You have to confirm that the user is a trusted one. For more information, see SAP Note

   For more information, see Preparing the Installation Media [page 82].

   **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 87].

   **Recommendation**

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

   **Only valid for 'Platform': Oracle Solaris**

   **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`

   **Note**

   If you are using a stack configuration file (see Installation Using a Stack Configuration File (Optional) [page 31]), you must call the `sapinst` executable with command line parameter

   `SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>`:

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

   **Note**

   If you need to assign virtual host names to the instance to be installed, and it is **not possible** to assign it by specifying it as an input parameter on the `<Instance Name> Instance` screen - which is the
recommended way - you can 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 Virtual Host Name in SAP System Parameters [page 48].

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>]**                                                                  
...                                                                                          
```

**Note**

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

1. Terminate the installer as described in Useful Information about the Installer [page 113].
2. Restart the installer from the command line with the `SAPINST_GUI_HOSTNAME=<hostname>` property.
   You can use a fully-qualified host name.

If you have a supported web browser (see Prerequisites for Running the Installer [page 104]) 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.

**Caution**

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

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

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

1. Click on the certificate area on the left hand side in the address bar of your browser, and view the certificate.
2. Open the certificate fingerprint or thumbprint, and compare all hexadecimal numbers to the ones displayed in the console output of the installer.
   Proceed as follows to get the certificate fingerprint or thumbprint from the server certificate printed in the installer console:
   1. Go to the `sapinst_exe.xxxxxx.xxxx` directory in the temporary directory to which the installer has extracted itself:
      `<User_Home>/.sapinst/`
   2. In the `sapinst_exe.xxxxxx.xxxx` directory, execute the `sapgenpse` tool with the command line option `get_my_name -p.`
As a result, you get the server fingerprint or thumbprint from the server certificate.

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

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

5. On the Welcome screen, choose the required option:
   ○ Perform preparations
     Go to Generic Options » Database » Preparations and choose the required task.
     To install SAP Host Agent separately, choose Generic Options » Database » Preparations » SAP Host Agent.
   ○ Install an SAP system or an optional standalone unit (Advanced Adapter Engine, Advanced Adapter Engine Extended, or Process Orchestration):
     ○ To install an SAP system based on SAP NetWeaver AS Java from scratch, choose Product » Installation » Application Server Java » System Variant.
     ○ To install the application server Java for an SAP Process Integration system based on SAP NetWeaver 7.5 from scratch, choose SAP NetWeaver 7.5 » Database » Installation » Application Server Java for SAP Process Integration » System Variant.
     ○ To install the application server Java for an SAP Solution Manager 7.2 system from scratch, choose SAP Solution Manager 7.2 » Support_Release » Installation » Database » SAP System » Application Server Java » System Variant.
     ○ To install an optional standalone unit from scratch, choose SAP NetWeaver » Release » Installation » Optional Standalone Units » Advanced Adapter Engine | Advanced Adapter Engine Extended | Process Orchestration » System Variant.
     ○ To install an SAP system based on SAP NetWeaver AS Java as target system of a system copy, choose Product » Database » System Copy » Target System » System_Variant » Based on AS Java.
     ○ To install the application server Java for an SAP Process Integration system based on SAP NetWeaver 7.5 as target system of a system copy, choose SAP NetWeaver 7.5 » Database » System Copy » Target System » System_Variant » Based on AS Java.
     ○ To install the application server Java for an SAP Solution Manager 7.2 system as target system of a system copy, choose SAP Solution Manager 7.2 » Support_Release » Database » System Copy » Target System » System_Variant » Based on AS Java.
     ○ To install an optional standalone unit as target system of a system copy, choose SAP NetWeaver » Release » Database » System Copy » Target System » System_Variant » Based on AS Java.
   ○ Install an additional application server instance, go to Product » Database » Additional SAP System Instances » Additional Application Server Instance.
   ○ Perform other tasks or install additional components
     Go to Generic Options » Database and choose the required task.

6. Choose Next.
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.

Follow the instructions on the installer screens 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.

If you want to install an SCS instance with integrated SAP Web Dispatcher [page 25], you must choose the Custom parameter mode.

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

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

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

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

For more information, see 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.

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.

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

Do not stop the installer or Application Server Java during this phase.

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 medium or a USB drive separate from your installation hosts. This might be useful for analyzing issues occurring later when you use the system. For security reasons, do not keep installation directories on installation hosts, but make sure that you delete them after saving them separately.

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

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

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.

12. 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/

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

    You find the installer log files in the sapinst_instdir directory. For more information, see Useful Information about the Installer [page 113].

5.7 Additional Information about the Installer

The following sections provide additional information about the installer.

Useful Information about the Installer [page 113]

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

Interrupted Processing of the Installer [page 114]

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 118]

Troubleshooting with the Installer [page 119]

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 120]

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 104].

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><code>TEMP=&lt;Directory&gt;</code></td>
</tr>
<tr>
<td></td>
<td><code>export TEMP</code></td>
</tr>
<tr>
<td>C shell (csh)</td>
<td><code>setenv TEMP Directory</code></td>
</tr>
<tr>
<td>Korn shell (ksh)</td>
<td><code>export TEMP=&lt;Directory&gt;</code></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.xxxxx.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`:
  ```bash
  ./sapinst -p
  ```
- If you want to perform the installation in unattended mode, see SAP Note 2230669 which describes an improved procedure using inifile.params.
- If required, stop the installer by choosing the Cancel button.

ℹ️ 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>Retry</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 keydb.xml file. We recommend that you view the entries in the log files, try to solve the problem, and then choose Retry. If the same or a different error occurs, the installer displays the same dialog box again.</td>
</tr>
<tr>
<td>Stop</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 keydb.xml 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>Continue</td>
<td>The installer continues the installation from the current point.</td>
</tr>
<tr>
<td>View Log</td>
<td>Access installation log files.</td>
</tr>
</tbody>
</table>

i 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 107].
2. Make sure that the installation media are still available.

   For more information, see Preparing the Installation Media [page 82].

   → 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 82].

→ 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]
   ********************************************************************************

   ...

   i Note

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

   1. Terminate the installer as described in Useful Information about the Installer [page 113].
   2. Restart the installer from the command line with the `SAPINST_GUI_HOSTNAME=<hostname>` property.

   You can use a fully-qualified host name.

   If you have a supported web browser (see Prerequisites for Running the Installer [page 104]) 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.
Caution

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

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

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

1. Click on the certificate area on the left hand side in the address bar of your browser, and view the certificate.
2. Open the certificate fingerprint or thumbprint, and compare all hexadecimal numbers to the ones displayed in the console output of the installer.
   Proceed as follows to get the certificate fingerprint or thumbprint from the server certificate printed in the installer console:
   1. Go to the sapinst_exe.xxxxxx.xxxx directory in the temporary directory to which the installer has extracted itself:
      <User_Home>/sapinst/
   2. In the sapinst_exe.xxxxxx.xxxx directory, execute the sapgenpse tool with the command line option get_my_name -p.
      As a result, you get the server fingerprint or thumbprint from the server certificate.
   3. Accept the warning to inform your browser that it can trust this site, even if the certificate could not be verified.

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

6. From the tree structure on the Welcome screen, select the installation option that you want to continue and choose Next.

   The What do you want to do? screen appears.

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

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Behavior</th>
</tr>
</thead>
</table>
| **Perform a new run**        | 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. The following naming convention is used for the backup directory: 

\[
\text{log}_{-} <\text{Day}>_{-} <\text{Month}>_{-} <\text{Year}>_{-} <\text{Hours}>_{-} <\text{Minutes}>_{-} <\text{Seconds}>
\]

**Example**

\[
\text{log}_01_{-}\text{Oct}_2016_{-}13_{-}47_{-}56
\]

**Note**

All actions taken by the installation before you stopped it (such as creating directories or users) are not revoked.

**Caution**

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.

| Continue with the existing one | The installer continues the interrupted installation from the point of failure. |

### 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`:

\[
\begin{align*}
\text{sapdp<Instance\_Number>} &= 32<\text{Instance\_Number}>/tcp \\
\text{sapdp<Instance\_Number>}s &= 47<\text{Instance\_Number}>/tcp \\
\text{sapgw<Instance\_Number>} &= 33<\text{Instance\_Number}>/tcp \\
\text{sapgw<Instance\_Number>}s &= 48<\text{Instance\_Number}>/tcp
\end{align*}
\]

**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<\text{Instance\_Number}>/tcp` the following range of entries is created:

\[
\begin{align*}
\text{sapgw00} &= 3300/tcp \\
\text{sapgw01} &= 3301/tcp \\
\text{sapgw02} &= 3302/tcp \\
&\vdots \\
\text{sapgw98} &= 3398/tcp
\end{align*}
\]
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:
   - Try to solve the problem:
     - 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 113].
     - 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 114].
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 the SAP Support requests you to do so, for example to resolve a customer incident.

**Prerequisites**

- SAP Support requests you to use the Step State Editor.
- Make sure that the host where you run the installer meets the requirements listed in Prerequisites for Running the Installer [page 104].

**Procedure**

1. Start the installer from the command line as described in Running the Installer [page 107] 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

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

Standard, Distributed, or High-Availability System

1. If required, you perform a full installation backup [page 143] immediately after the installation has finished.
2. You check and if necessary modify the settings for the operating system users for your SAP system if they were created by the installer.
   For more information, see Creating Operating System Users and Groups [page 66].
3. You check whether you can log on to the Application Server Java [page 122].
4. You install the SAP license [page 126].
5. If you have installed a high-availability system, you set up the licenses for high availability [page 127].
6. You configure the remote connection to SAP support [page 129].
7. For production systems it is highly recommended that you connect the system to SAP Solution Manager [page 129].
8. You apply the latest kernel and Support Packages [page 131].
9. You configure the Process Integration system after installation [page 132].

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

10. You ensure user security [page 137].
11. You run automated configuration [page 140].
12. If you have installed a non-central Advanced Adapter Engine as an optional standalone unit, you clear the SLD Data Cache [page 141].
13. You enable the database [page 142].
14. You perform a full installation backup [page 143].
15. If you chose to install an integrated SAP Web Dispatcher within the SCS instance, you log on to the SAP Web Dispatcher Management Console [page 145].

16. If you chose to install an integrated SAP Web Dispatcher within the SCS instance, you configure the SAP Web Dispatcher [page 146].

17. You check the Master Guide for your SAP Business Suite application or SAP NetWeaver application (section Configuration of Systems and Follow-Up Activities) for additional implementation and configuration steps, such as language installation, monitoring, work processes, transports, SAP license, printers, system logs, and connectivity to system landscape directory (SLD).

**Additional Application Server Instance**

1. If required, you perform an installation backup [page 143] immediately after the installation has finished.

2. You check and if necessary modify the settings for the operating system users for your SAP system if they were created by the installer. For more information, see Creating Operating System Users and Groups [page 66].

3. You check whether you can log on to the Application Server Java [page 122].

4. You ensure user security [page 137].

5. You perform a full installation backup [page 143].

**6.2 Logging On to the Application Server Java**

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

**Prerequisites**

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

**Context**

**i Note**

In a distributed or high-availability system, you check whether you can log on to every instance of the SAP system that you installed.
Java User in a Dual-Stack System (SAP Process Integration (PI) 7.5 system or SAP Solution Manager 7.2 system only)

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: ABAP System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>J2EE_ADMIN (default) or the name you gave this user during the installation process.</td>
</tr>
</tbody>
</table>

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

Java Standalone User

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: Database</th>
<th>User Name Storage: External ABAP System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>Administrator</td>
<td>The user that you created manually in the external ABAP system. The recommended name is J2EE_ADMIN_&lt;SAPSID_Java_System&gt;</td>
</tr>
</tbody>
</table>

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

**Procedure**

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

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

   <i>Note</i>

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

   <i>Example</i>

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

   <http://saphost06:50400>

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

2. Log on by pressing the link of any of the provided applications, for example *SAP NetWeaver Administrator* or *System Information*.

**Related Information**

Preparing an External ABAP System as Source for User Data [page 80]
6.3 Logging On to the SAP Enterprise Portal

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

Prerequisites

The SAP system is up and running.

Context

Java Standalone User

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: Database</th>
<th>User Name Storage: External ABAP System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>Administrator</td>
<td>The user that you created manually in the external ABAP system. The recommended name is J2EE_ADM_&lt;SAPSID_Java_System&gt;</td>
</tr>
</tbody>
</table>

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

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

Procedure

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

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

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

http://saphost06:50400/irj

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

6.4 Logging On to the Development Infrastructure

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

Procedure

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

   Note

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

   Example

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

   http://saphost06:50400

2. Log on with the NWDI_ADM user.

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

   The following links appear:
   ○ Design Time Repository
   ○ Component Build Service
   ○ Change Management Service
   ○ System Landscape Directory

3. Log on to these services one after another by clicking the appropriate link:
   a. When you click Design Time Repository, the Design Time Repository page with the Repository Browser overview appears.
   b. When you click Component Build Service, the Component Build Service page with the CBS Buildspace Information appears.
c. When you click Change Management Service, the Change Management Service page with the CBS Buildspace Information appears.

d. When you click System Landscape Directory, you should see the System Landscape Directory start page.

**i Note**

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

### 6.5 Providing Access to the SAP NetWeaver Administrator

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

**Context**

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

**Procedure**

Allow access to administration requests for the required network segments as described in SAP Note 1451753.

### 6.6 Installing the SAP License

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

**Context**

⚠️ **Caution**

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

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

Procedure

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

\[\text{Note}\]

If you have installed a high-availability system, proceed as described in **High Availability: Setting Up Licenses** [page 127].

<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 Licenses</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>○ SAP NetWeaver 7.4</td>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></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>
</tbody>
</table>

6.7 **High Availability: Setting Up Licenses**

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

Prerequisites

The SAP system is up and running.
Context

SAP has implemented a license mechanism for switchover solutions and clustered environments. Your customer key is calculated on the basis of local information on the message server host. This is the host machine where the central services instance (SCS instance) runs.

To be able to perform a switchover, the temporary license that is installed automatically with the SCS instance is not sufficient. You first need to install a permanent license, which is determined by the hardware environment of the message server. Since SAP’s high-availability (HA) solution stipulates two or more cluster nodes (host machines) where the message server is enabled to run, you have to order as many license keys [page 126] as you have cluster nodes.

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

Procedure

1. To find the hardware key of the primary host, run the SAP NetWeaver Administrator (NWA) on any application server instance and choose Configuration Management > Infrastructure Management > Licenses.
   
   The hardware key is displayed in the NWA.
2. Perform a switchover of the central services instance (SCS) to another node in the cluster and repeat the previous step.
   
   Repeat this for all remaining nodes in the cluster.
3. To obtain the two license keys, enter the hardware IDs for each cluster node, where message server is enabled to run: http://support.sap.com/licensekey
4. To import the files containing the two licenses to the primary cluster node, run the NWA on any application server instance and choose:
   
   Configuration Management > Infrastructure Management > Licenses
5. Perform a switchover of the central services instance (SCS) to another node in the cluster and repeat the previous step.
   
   Repeat this for all remaining nodes in the cluster.

Results

The license is no longer a problem during switchover. This means you do not need to call saplicense in your switchover scripts.
6.8 Configuring the Remote Connection to SAP Support

SAP offers its customers access to support and a number of remote services such as the Early Watch Service or the GoingLive Service. Therefore, you have to set up a remote network connection to SAP. For more information, see SAP Support Portal at https://support.sap.com/remote-support.html.

6.9 Connecting the System to SAP Solution Manager

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

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise
If your SAP Solution Manager release is 7.2:

http://help.sap.com/solutionmanager Version 7.2 SPS <No> Application Help (English)

Technical Infrastructures Landscape Management Database (LMDB) Setting 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:

http://help.sap.com/solutionmanager Version 7.1 SPS <No> Application Help (English)

SAP Solution Manager Operations Managing System Landscape Information Setting Up the Landscape Management Infrastructure Connecting LMDB to System Landscape Directory (SLD)

○ If your SAP Solution Manager release is 7.2:

http://help.sap.com/solutionmanager Version 7.2 SPS <No> Application Help (English)

Technical Infrastructures Landscape Management Database (LMDB) Setting Up the Landscape Management Infrastructure 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:

Managing Technical System Information and Managing Product System Information at http://help.sap.com/solutionmanager Version 7.1 SPS <No> Application Help (English)

SAP Solution Manager Operations Managing System Landscape Information

○ 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

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

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise

Post-Installation
6.10 Applying the Latest Kernel and Support Package Stacks

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

**i Note**

If you are using a stack configuration file (see Installation Using a Stack Configuration File (Optional) [page 31]), 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**

**i Note**

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

**Procedure**

- If you want to update the kernel manually, proceed as described below:
  a. Log on as user <sapsid>adm to the hosts of the SAP system instances to be updated.
  b. Download the latest kernel for your operating system and database platform as described in SAP Note 19466.
  c. Back up the kernel directory that is specified by the profile parameter DIR_CT_RUN.
  d. Extract the SAR files of the kernel Support Packages of the target SP level to a temporary directory using the SAPCAR tool.
  e. Copy or move the extracted programs from the temporary directory to the local kernel directory.
  f. Adjust the ownership and permissions of the kernel binaries by entering the following command sequence (Execute the saproot.sh script that is located in the kernel directory):

```
su - root

cd <Kernel_Directory>

./saproot.sh <SAPSID>
```
6.11  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.

Procedure

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

**i Note**

The CTC Wizard automatically executes all required technical configuration steps.

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

<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><img src="https://help.sap.com/nw75" alt="Application Help" /></td>
</tr>
<tr>
<td></td>
<td><img src="https://help.sap.com/nw75" alt="English" /></td>
</tr>
<tr>
<td></td>
<td><img src="https://help.sap.com/nw75" alt="Process Integration" /></td>
</tr>
<tr>
<td></td>
<td><img src="https://help.sap.com/nw75" alt="Configuring" /></td>
</tr>
<tr>
<td></td>
<td><img src="https://help.sap.com/nw75" alt="Process Integration After Installation" /></td>
</tr>
<tr>
<td></td>
<td><img src="https://help.sap.com/nw75" alt="Configuring Process Integration (PI) Dual Usage" /></td>
</tr>
<tr>
<td></td>
<td><img src="https://help.sap.com/nw75" alt="Type" /></td>
</tr>
<tr>
<td></td>
<td><img src="https://help.sap.com/nw75" alt="Basic Configuration for SAP Process Integration (PI)" /></td>
</tr>
</tbody>
</table>
6.12 PI-PCK, PI-AF, PI-AEX, PI-CP Only: System Configuration After the Installation

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

CTC Wizards or Functional Unit Configurations

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

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

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

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

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

http://help.sap.com/nw73

Configuring Process Integration (PI) After Installation > Basic Configuration (CTC Wizard-Assisted and Manual) > Configuring the Partner Connectivity Kit > Wizard-Based Configuration for the PCK

Configuring the Adapter Engine (PI-AF)

To configure your PI-AF system after the installation execute “PI-AF initial setup” CTC Wizard described in SAP Note 1314855.
For more information about all single configuration steps executed by the CTC Wizard and how to apply them manually, see the SAP Library at:

<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 Process Integration 7.1 Including Enhancement Package 1 <a href="http://help.sap.com/nwpi71">http://help.sap.com/nwpi71</a></td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 <a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></td>
<td>If you want to connect PI-AF to a PI system:</td>
</tr>
<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>If you want to connect PI-AF to a PI-AEX system:</td>
</tr>
</tbody>
</table>

If you want to connect PI-AF to a PI system:

<table>
<thead>
<tr>
<th>SAP NetWeaver 7.3 including Enhancement Package 1 <a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></th>
<th>If you want to connect PI-AF to a PI-AEX or PI-CP system:</th>
</tr>
</thead>
</table>

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise
SAP NetWeaver 7.4

If you want to connect PI-AF to a PI system:


SAP NetWeaver 7.5

If you want to connect PI-AF to a PI system:


If you want to connect PI-AF to a PI-AEX or PI-CP system:

- Application Help ➤ Function-Oriented View: English ➤ Process Integration ➤ Configuring Process Integration After Installation ➤ Configuring Advanced Adapter Engine Extended (PI-AEX) ➤ Basic Configuration for SAP PI Advanced Adapter Engine Extended ➤ Configuring the Non-Central Advanced Adapter Engine (PI-AF) for AEX

SAP NetWeaver 7.30 or Higher: Configuring the Advanced Adapter Engine Extended (PI-AEX)

To configure your PI-AEX system after the installation, execute the “PI-AEX initial setup” CTC Wizard described in SAP Note 1414465.
For more information about all single configuration steps executed by the CTC Wizard and how to apply them manually, see the SAP Library at:

<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 ➤ Process Integration ➤ Configuring Process Integration (PI) After Installation ➤ Basic Configuration (CTC Wizard-Assisted and Manual) ➤ Basic Configuration for SAP NetWeaver PI Advanced Adapter Engine Extended</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Application Help ➤ Function-Oriented View: English ➤ Process Integration ➤ Configuring Process Integration After Installation ➤ Configuring Advanced Adapter Engine Extended (PI-AEX)</td>
</tr>
</tbody>
</table>

**SAP NetWeaver 7.30 Including Enhancement Package 1 and Higher: Configuring the Process Orchestration (PI-CP)**

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

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

<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 including Enhancement Package 1</td>
<td>Application Help ➤ Function-Oriented View: English ➤ Process Integration ➤ Configuring Process Integration After Installation ➤ Configuring Process Orchestration (PI-CP)</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td>➤</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td>➤</td>
</tr>
</tbody>
</table>
6.13 Configuring the User Management

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

Procedure

During the installation of your SAP system, you specified one of the following initial data sources of the User Management Engine (UME) (for more information, see SAP System Parameters [page 48]):

- Database of the Application Server Java
- External ABAP system

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

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

⚠️ Caution

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

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

<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  
  https://help.sap.com/nw73 |  Application Help  
  Function-Oriented View: English  |
| - SAP NetWeaver 7.3 including Enhancement Package 1  
  https://help.sap.com/nw731 |  Security  
  Identity Management  
  User Management of the Application Server Java  
  Configuring User Management  |
| - SAP NetWeaver 7.4  
  https://help.sap.com/nw74 |  UME Data Sources |
| - SAP NetWeaver 7.5  
  https://help.sap.com/nw75 |

6.14 Ensuring User Security

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

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

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

→ Recommendation
In all cases, the user ID and password are encoded only when transported across the network. Therefore, we recommend using encryption at the network layer, either by using the Secure Sockets Layer (SSL) protocol for HTTP connections, or Secure Network Communications (SNC) for the SAP protocols dialog and RFC.

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

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

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

Operating System and Database Users

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

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

You do not have to do this if you specified this “cleanup” already during the Define Parameters phase on the Cleanup Operating System Users screen. Then the removal had already been done automatically when the processing of the installer had completed. For more information, see Operating System Users in SAP System Parameters [page 48].

Operating System Users

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIX superuser root</td>
<td>No primary group assigned by the installer (group sapinst is assigned as secondary group)</td>
</tr>
<tr>
<td>SAP system administrator sapsid&gt;adm</td>
<td>sapsys (sapinst as secondary group)</td>
</tr>
<tr>
<td>syb&lt;dbsid&gt;</td>
<td>sapsys</td>
</tr>
</tbody>
</table>
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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You do not need to change the password of this user after the installation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This user is for administration purposes only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You are not able to log on as sapadm as this user is locked.</td>
</tr>
</tbody>
</table>

SAP System Users

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

- If you have chosen option *Use Java Database*, UME users are stored in the database (Java UME) – see table *Users Stored in the Java Database* below. You can manage users and groups with the UME Web admin tool and the SAP NetWeaver Administrator only.
- If you have chosen option *Use ABAP*, UME users are stored in an external ABAP system (ABAP UME) – see table *Users Stored in an External ABAP System* below. For more information, see Preparing an External ABAP System as Source for User Data [page 80].

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

SAP System Users Stored in an External ABAP System

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: External ABAP System</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server Java Administrator</td>
<td>The name that you gave this user when you created it manually in the external ABAP system (see Preparing an External ABAP System as Source for User Data [page 80])</td>
<td>This user’s password is stored in secure storage. Therefore, whenever you change the administrator’s password, you must also change the password in secure storage with the Config Tool.</td>
</tr>
</tbody>
</table>

→ Recommendation

We recommend that you use strong password and auditing policies for this user.
### User Name Storage: External ABAP System

<table>
<thead>
<tr>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server Java Guest</td>
<td>The name that you gave this user when you created it manually in the external ABAP system (see Preparing an External ABAP System as Source for User Data [page 80])</td>
</tr>
<tr>
<td>Communication user for Application Server Java</td>
<td>The name that you gave this user when you created it manually in the external ABAP system (see Preparing an External ABAP System as Source for User Data [page 80])</td>
</tr>
</tbody>
</table>

### User Name Storage: Database

<table>
<thead>
<tr>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>This user’s password is stored in secure storage. Therefore, whenever you change the administrator’s password, you must also change the password in secure storage with the AS Java Config Tool.</td>
</tr>
<tr>
<td></td>
<td><strong>Recommendation</strong></td>
</tr>
<tr>
<td></td>
<td>We recommend that you use strong password and auditing policies for this user.</td>
</tr>
<tr>
<td>Guest</td>
<td>This user is used for anonymous access.</td>
</tr>
<tr>
<td></td>
<td>Lock this user for interactive logon.</td>
</tr>
</tbody>
</table>

### SAP System Users Stored in the Database

<table>
<thead>
<tr>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>The name that you gave this user during the installation or the default name Administrator</td>
</tr>
<tr>
<td>Guest</td>
<td>The name that you gave this user during the installation or the default name Guest</td>
</tr>
</tbody>
</table>

### 6.15 Performing Automated Configuration

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

**Caution**

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

- Upgrade
- Update

---

**Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise**

---

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

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

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

### SAP Release and SAP Library Quick Link

- SAP NetWeaver 7.3
  - [https://help.sap.com/nw73](https://help.sap.com/nw73)
- SAP NetWeaver 7.3 including Enhancement Package 1
  - [https://help.sap.com/nw731](https://help.sap.com/nw731)
- SAP NetWeaver 7.4
  - [https://help.sap.com/nw74](https://help.sap.com/nw74)
- SAP NetWeaver 7.5

### 6.16 Clearing the SLD Data Cache after Installing a Non-central Advanced Adapter Engine (Optional Standalone Unit)

When you have installed a **non-central** Advanced Adapter Engine, you need to manually clear the SLD Data Cache in the Integration Builder to make it visible and selectable in the communication channels.

#### Procedure

1. **After SAPinst has finished**, open the Integration Builder of your PI system at [http://<host>:<port>/dir/start/index.jsp](http://<host>:<port>/dir/start/index.jsp) and logon as a user with the ABAP role **SAP_XI_CONFIGURATOR** assigned.
2. In the Integration Builder, choose **Environment**.
3. From the drop-down list, choose **Clear SLD Data Cache**.
6.17 Enabling the Database

Use

After the SAP system installation, you must enable the database.

Procedure

⚠️ Caution

The DBA Cockpit is not available in a Java-only system. To monitor the ASE database of your Java stack, connect it to a DBA Cockpit of an ABAP system in your system landscape.

1. Make sure that the version of your database is still supported, and check if there are newer versions available. For more information, see SAP Notes 1554717 and 1590719.
2. You must enable the database for monitoring by setting up a DBA Cockpit Framework (DCF) after the SAP system installation. The DCF provides a time-based collection and evaluation of performance, configuration, and space-related data. In your SAP system, call transaction DBACOCKPIT to start the DBA Cockpit. Calling the DBA Cockpit automatically checks the existence of the DCF.

→ Recommendation

To make sure that the DCF was set up correctly, we recommend that you go to Configuration > Data Collectors and Admin Procedures in the DBA Cockpit.

For further details, refer to the SAP ASE database administration guide https://help.sap.com/viewer/ase_admin.

3. Apply the latest patches for the DBA Cockpit. For more information, see SAP Note 1558958.
4. Set up Automatic Table Maintenance in the DBA Cockpit. Read the article DBA Cockpit: Automatic Table Maintenance for SAP ASE (http://scn.sap.com/docs/DOC-15162).
5. Check SAP Note 1539124 to make sure that the database configuration for your SAP installation complies with SAP’s requirements and recommendations.
6. For systems with high load, refer to SAP Note 1722359.
6.18 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 <sapid>adm

- All database-specific directories

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

ℹ️ Note
This list is only valid for a standard installation.

Prerequisites

You have logged on as user <sapid>adm and stopped the SAP system and database [page 176].

Use the backup tool of your choice and refer to the backup software documentation. You can also use the standard UNIX commands as described below.

Backing Up the Installation

1. Log on as user root.
2. Manually create a compressed tar archive that contains all installed files:
   - Saving to tape:
     `tar -cf - <file_system> | compress -c > <tape_device>`
   - Saving to the file system:
     `tar -cf - <file_system> | compress -c > ARCHIVENAME.tar.Z`
If required, you can restore the data that you previously backed up.

⚠️ Caution

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

1. Log on as user `root`.
2. Go to the location in your file system where you want to restore the backup image.
3. Restore the data with the following commands:
   - From tape:
     ```
     cat <tape_device> | compress -cd | tar -xf -
     ```
   - From the file system:
     ```
     cat ARCHIVENAME.tar.Z | compress -cd | tar -xf -
     ```

Only valid for `Platform`: Linux

Linux only: If you want to restore the data from a GNU `tar` archive, you have to execute the following command:

```
ls -zxzf <ARCHIVENAME>.tgz
```
6.19 Logging on to the SAP Web Dispatcher Management Console

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

Context

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

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

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

Procedure

1. Open a web browser.
2. Enter the following URL, depending on whether you use HTTP or HTTPS:
   
   \texttt{http(s)://Webdispatcher\_Host>:<HTTP(S\_PORT>)/sap/wdisp/admin/public/default.html}

   \textbf{Example}

   \begin{verbatim}
   \end{verbatim}

3. Log on as user webadm with the password that you entered during the input phase of the installation.
   
   The \textit{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 \texttt{Admin Handler}, see the SAP Library at:

Related Information

SCS Instance with Integrated SAP Web Dispatcher [page 25]
6.20 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 SCS instance.

You can find the configuration information 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 &gt; Function-Oriented View &gt; Application Server Infrastructure &gt; Components of SAP NetWeaver Application Server &gt; SAP Web Dispatcher</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>
</tbody>
</table>

**Related Information**

SCS Instance with Integrated SAP Web Dispatcher [page 25]
7 SAP ASE 15.7: Disaster Recovery Setup with SAP Replication Server

7.1 Disaster Recovery Setup with SAP Replication Server

In the following chapters you will learn how to set up a disaster recovery solution using SAP ASE 15.7, the SAP Replication Server and the Disaster Recovery Agent Management utility.

⚠️ Caution

Carefully follow the instructions outlined in the following chapters. This is the only supported installation method to set up a disaster recovery solution with the SAP Replication Server!

This solution is not designed to support high availability, reporting, or other solutions that might be supported by replication tools.

In a typical replication scenario, the SAP system updates data on the primary database. Transactions are replicated automatically to the standby database by the replication software. In a failover scenario, the SAP application connections are switched to the standby database. Transactions generated on the standby database continue to be saved by the replication server until the primary database comes back online. Once the primary database returns to service, the saved standby database transactions are released and applied to the primary host. Both databases are resynchronized.

The figure below illustrates the replication architecture. It consists of the primary and the standby environments. The database and replication servers need to be run on the same hardware platform and operating system at both sites. The hosts can be virtual or physical machines, or a mix of both.
All components of a primary or standby environment can run on the same host (co-located environment). It is also possible to separate the database and the Replication Server (dis-located environment). The Replication Server and Disaster Recovery Agent must run on the same host.

⚠️ Caution

The installation and uninstallation processes require having the SAP system mount directory (/sapmnt/<SID>) available on that host.

For more information, refer to chapter Required File Systems and Directories [page 71] and to the figures below.

Replication is set up to support a replication in both directions between the primary and the standby site, although only one direction is available at any one point in time. Two databases are replicated between the primary and the standby site:

- SAP application database
- SAP ASE master database

Initially, the SAP Business Suite product must be installed with the SAP ASE database on the primary site. The SAP Netweaver Application Server can be installed on the database host or a separate host. The standby database must be a copy of the database instance of the primary site. In case of a failover, the work processes of the SAP Netweaver Application Server will automatically reconnect to the standby database.

⚠️ Caution

Do not enable a replication environment if you are not familiar with the SAP Replication Server product. Particularly in outage situations, the database log of the primary database can run out of space and the SAP system could face downtime as a result. Stopping the replication in an inappropriate manner may require rematerialization of the standby database.

Read SAP Note 1891560 before you start the installation. This SAP Note contains the most recent information on the installation, as well as corrections to the installation documentation.

For more information, see the following guides:

- Rolling Database Update in an SAP ASE and SAP Replication Server Environment:
  http://scn.sap.com/docs/DOC-66707
- HADR Users Guide:
  http://scn.sap.com/docs/DOC-65921

7.2 Implementation Considerations

The standby database requires the same levels of protection and scheduled maintenance as the primary database. Periodic reorganizations, generation of statistics, and other housekeeping tasks are also required on the standby site. The standby site requires its own backup and recovery process. This includes disk-based file backup and recovery, as well as dump creation and archiving at database level.

As a result of the logical replication method, the standby database might need more device space than the primary site. Dump files from the primary host cannot be used for recovery of the standby site. Once
replication begins, the physical attributes of the primary and standby databases are no longer equivalent and they cannot share the same dump and load files for recovery.

During replication, additional information is written to the database transaction log for each database. The transaction log volume will increase by 40 to 50%.

The master database will always be replicated. It is not possible to exclude it.

### 7.3 Prerequisites

The following prerequisites must be fulfilled before you set up a disaster recovery solution:

<table>
<thead>
<tr>
<th>Area</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software</td>
<td>SAP recommends to install the latest versions of SAP ASE and of the SAP Replication Server:</td>
</tr>
<tr>
<td></td>
<td>For more information on the latest versions and the certified combinations of SAP ASE and SAP Replication Server, see SAP Note <a href="https://support.sap.com/kb1891560">1891560</a>.</td>
</tr>
<tr>
<td>Note</td>
<td><strong>Only valid for 'Platform': AIX</strong></td>
</tr>
<tr>
<td></td>
<td><strong>AIX only:</strong></td>
</tr>
<tr>
<td></td>
<td>Update the OS libraries on the host that will run the replication server.</td>
</tr>
<tr>
<td></td>
<td>Install <code>fileset xlsmp.rte</code>.</td>
</tr>
<tr>
<td></td>
<td><strong>End of 'Platform': AIX</strong></td>
</tr>
<tr>
<td>Hardware</td>
<td>Database and replication server must use the same hardware platform. SAP recommends installing the replication server on a separate host to keep the impact on the database as low as possible.</td>
</tr>
<tr>
<td>ASE Server Names</td>
<td>The SAP ASE server name is based on the <code>&lt;SID&gt;</code> value and is the same on both primary and standby sites.</td>
</tr>
<tr>
<td></td>
<td>The SAP database name is the same on both sites.</td>
</tr>
</tbody>
</table>
### Requirements:

#### Directories

For an SAP installation, the replication environment must be installed in the following directory:

```
/sybase/<SID>_REP
```

Reserve at least 6 GB free space for software and configuration files.

The initial replication server partition file is placed in a folder at:

```
/sybase/<SID>_REP/repdata_1
```

You can specify another folder for placing replication server partition files during installation. This allows distribution of disk I/O to several disks.

The initial size of the partition file should be at least factor 1.5 of the log size of the SAP application database. Reserve additional 2 GB for replication server usage in this folder.

#### TCP/IP ports

In addition to the ASE TCP/IP ports, the following ports are required for the replication environment:

- Replication server: 4905
- Replication server system database: 4906
- Replication server system database replication agent: 4907
- DR agent RMI: 4908
- DR agent: 4909

The values for the TCP/IP ports are default values. It is possible to customize the port numbers.

The primary and the standby site can use the same port numbers.

#### Database Time Synchronization

Both primary and standby databases must have the same UTC time. Otherwise the SAP application will not work properly, if the SAP system is using the standby database.

#### Database User

The following users are required on both sites:

- `sapsa`
- `sapso`
- Replication user (`<SID>_maint`)
- DR agent administrator (`DR_admin`)

The `sapsa` and `sapso` logins and their passwords must be identical across both databases. The replication user and the DR agent administrator are created by the SAP installer.

Be aware that the database user `DR_admin` is included in the secure storage of the SAP system, should you want to change the password.

#### Operating system user

The replication server and the DR agent are started with OS user `syb<dbsid>`. All operating system users and groups need to have the same user and group ID on all servers.
7.4 Installing the Replication Environment

Choose one of the following topologies and perform the appropriate installation steps to enable replication of an SAP system:

- Co-Located Replication Topology: PAS at the Primary Site [page 151]
- Co-Located Replication Topology: PAS on a Separate Server [page 153]
- Dis-Located Replication Topology: PAS on a Separate Server [page 155]

⚠️ Caution

- SRS is installed silently as part of the installation of the respective SAP product. Do not install the SRS separately.
- If you use virtual host names, choose parameter mode Custom during the installation. The installer will ask for the server names of SAP ASE and SRS. Enter the virtual host names not the physical host names. If the databases are located in different networks, specify the fully qualified DNS Domain Name (FQDN).
- The DR agent will tune the SRS memory parameters based on the Physical Memory value of the SRS. If the values need to be changed after the installation, run the DR_agent command sap_tune_rs again on both sites.

7.4.1 Co-Located Replication Topology: Central Instance at the Primary Site

The following replication topology shows a co-located scenario. The database and the SAP Replication Server are installed on the same server. In this scenario the Primary Application Server (PAS) is also installed on one of the database servers.
Co-Located Replication Topology: Primary Application Server at the Primary Site

**Prerequisites**

You have installed an SAP application on SAP ASE. The Primary Application Server (PAS) and ASE 1 are installed on host 1 according to the SAP Installation Guide.

**Installation Steps**

Proceed as follows to install an additional replication environment to ensure high availability:

---

**Note**

The following procedure describes the installation steps for a replication environment. Standard inquiries for the software location and the password need to be filled out as well.

- Step 1: Install the SAP Replication Server software on host 1.
- Step 2: Install the secondary ASE database and SAP Replication Server on host 2. Configure the replication environment on host 2.

**Step 1: Install the SAP Replication Server software on host 1.**

1. Run the installer with the following option: ```SAP NetWeaver <Version> SAP ASE Database Replication Setup of Replication Environment```.
2. Follow the instructions in the installation dialog. Select the following options:
   1. Select `Install the replication server software`.
   2. Finish the installation process.
Step 2: Install the secondary ASE database and SAP Replication Server on host 2. Configure the replication environment on host 2.

1. Run the installer with the following option: [SAP NetWeaver <Release>] SAP ASE Database Replication Setup of Replication Environment.
2. Follow the instructions in the installation dialog. Select the following options:
   - Set up a secondary database instance
   - Install the replication server software
   - Configure the replication system
   - Materialize the secondary databases
     Select the desired materialization method.
     The materialization step performs the initial copy of database content from one site to the other. Once completed, the replication software will maintain the data integrity of the target site by continuously applying changes that occur after completion of the materialization process. The procedure for materialization is dependent on the type and size of the database being materialized (see section Materializing Databases). The installer provides user interaction points that are used to synchronize the replication environment with the end user’s manual dump and load activities.
3. Finish the installation process.

7.4.2 Co-Located Replication Topology: PAS on a Separate Server

The following replication topology shows a co-located scenario. The database and the SAP Replication Server are installed on one server. The Primary Application Server (PAS) is installed on a separate server.
Prerequisites

You have installed an SAP application on SAP ASE. The Primary Application Server (PAS) and ASE 1 are installed on host 1 according to the SAP Installation Guide.

SAP system folder (/sapmnt/<SID>) of host 3 is mounted on host 1.

The SAP central instance and the application server are installed on host 3.

ASE 1 is installed as a distributed database instance on host 1.

Installation Steps

The following procedure describes the installation steps for a replication environment to ensure high availability. Standard inquiries for the software location and the password need to be filled out as well.

- Step 1: Install the SAP Replication Server software on host 1.
- Step 2: Install the secondary ASE database and SAP Replication Server on host 2. Configure the replication environment on host 2.

Step 1: Install the SAP Replication Server software on host 1.

1. Run the installer with the following option: \texttt{SAP NetWeaver <Release> \ SAP ASE \ Database Replication \ Setup of Replication Environment).
2. Follow the instructions in the installation dialog. Select the following options:
   1. Select \texttt{Install the Replication Server software}.
   2. Finish the installation process.

Step 2: Install the secondary ASE database and SAP Replication Server on host 2. Configure the replication environment on host 2.

1. Run the installer with the following option: \texttt{SAP NetWeaver <Release> \ SAP ASE \ Database Replication \ Setup of Replication Environment}.
2. Follow the instructions in the installation dialog. Select the following options:
   - \texttt{Set up a secondary database instance}
   - \texttt{Install the replication server software}
   - \texttt{Configure the replication system}
   - \texttt{Materialize the secondary databases}
     Select the desired materialization method.
The materialization step performs the initial copy of database content from one site to the other. Once completed, the replication software will maintain the data integrity of the target site by continuously applying changes that occur after completion of the materialization process. The procedure for materialization is dependent on the type and size of the database being materialized (see section Materializing Databases). The installer provides user interaction points that are used to synchronize the replication environment with the end user’s manual dump and load activities.

3. Finish the installation process.

7.4.3 Dislocated Replication Topology: Central Instance on a Separate Server

The following replication topology shows a dislocated scenario. The database, the SAP Replication Server, and the Primary Application Server (PAS) are installed on separate hosts.

**Prerequisites:**
- You have installed an SAP application on SAP ASE. You want to install an additional replication environment to ensure high availability.
- SAP system folder (/sapmnt/<SID>) of host 3 is mounted on host 1.
- The SAP central instance and the application server are installed on host 5.
- ASE 1 is installed as a distributed database instance on host 1.
Installation Steps

The following procedure describes the installation steps for a replication environment to ensure high availability. Standard inquiries for the software location and the password need to be filled out as well.

- Step 1: Install the SAP Replication Server software on host 3.
- Step 2: Install the secondary ASE database on host 2.
- Step 3: Install the SAP Replication Server and configure the replication environment on host 4.

Step 1: Install the SAP Replication Server software on host 3.

Procedure:

1. Run the installer with the following option: SAP NetWeaver <Release> > SAP ASE > Database Replication Setup of Replication Environment.
2. Follow the instructions in the installation dialog.
   Select the following option:
   Install the replication server software
   Finish the installation process.

Step 2: Install the secondary ASE database on host 2.

Procedure:

1. Run the installer with the following option: SAP NetWeaver <Release> > SAP ASE > Database Replication Setup of Replication Environment.
2. Follow the instructions in the installation dialog using the installation option Custom.
   Select the following option:
   Set up a secondary database instance
   Finish the installation process.

Step 3: Install the SAP Replication Server. Configure the replication environment on host 4.

1. Run the installer with the following option: SAP NetWeaver <Release> > SAP ASE > Database Replication Setup of Replication Environment.
2. Follow the instructions in the installation dialog. Select the following options:
   ○ Install the replication server software
   ○ Configure the replication system
   ○ Materialize the secondary databases
     Select the desired materialization method.
The materialization step performs the initial copy of database content from one site to the other. Once completed, the replication software will maintain the data integrity of the target site by continuously applying changes that occur after completion of the materialization process. The procedure for materialization is dependent on the type and size of the database being materialized (see section Materializing Databases). The installer provides user interaction points that are used to synchronize the replication environment with the end user’s manual dump and load activities.

3. Finish the installation process.

7.4.4 Materializing Databases

This section describes how to materialize the following databases:

- Master database
- SAP database

**Materialize the Master Database**

Some information in the master database is site-specific. The only master database changes that are replicated are logins and roles for synchronizing users and credentials between the two sites. The DR agent facilitates materialization of the master database providing an automated materialization function. The SAP installer materializes the master database automatically.

**Materialize the SAP Database**

The SAP installer, by default, offers automatic database materialization through database dump and load. This is the easiest method to materialize the SAP application database on the standby site. In this case, the installer will execute the `dump database` and `load database` commands without the interaction of a database administrator. Large databases may not fit for automatic materialization. Their size requires timing and control that is best left to the attention of the administrator. Therefore it is also possible to perform a customized database materialization. The SAP installer provides user interaction points that are used to synchronize the replication environment with the end user’s manual database actions.

To guarantee recoverability, read SAP Note [1585981](https://support.sap.com/).

7.4.4.1 Manual Materialization

The following methods are available:

- Using Single Database Dump and Load
Using Single Database Dump and Load

If the database is small enough to support materialization using a single database dump file, the sequence for performing this process is as follows:

1. The installer stops for manual loading of the standby database. The primary database contains the necessary replication markers at this time.
2. Dump the database using the command `dump database` in the primary database server.
3. Copy the dump file to the standby site. You can use shared storage or FTP to make a copy of the dump file available at the standby site.
4. Load the SAP database using the ASE command `load database` in the standby database server.
5. Bring the standby database online using the command `online database` to make the database available for use in the standby system.
6. Confirm the installer dialog. The database will be checked for the dump marker.

Using Database and Transaction Dump and Load

For large databases, it may be impractical to create a new dump of the entire database. Or the time required to dump the database might create a backlog of hours or days that replication would need to apply in order to get back in sync. To facilitate materialization for large databases, the dump can be done in advance and transferred to the target side before the replication is started. Using this method, which includes transaction dumps, means that the replication delay and backlog are kept to a minimum.

The key difference in this technique is that the SAP installer is not involved until just before the last transaction dump is to be created. This allows the replication products to only address activity that occurs after the last transaction dump.

The sequence for performing materialization using transaction dump and load is as follows:

1. Dump the database on the primary database server. This can be a new dump or an existing dump if your system is already configured to perform periodic dumps of the entire database. If you are creating a new dump, use the ASE command `dump database` in the primary database server to create a dump of the entire database. Transfer the database dump to the standby site.
2. Install the SAP Replication Server software and perform the configuration on the primary site just before you intend to do the last transaction dump/load.
3. The installer stops for manual loading of the standby database. The primary database now contains the necessary replication markers.

---

**Note**

Make sure that there is no automatic `dump database` or `dump transaction` enabled at that time. Once you start the installer on the primary site to install and configure the replication server no automatic/manual dump should occur.
4. Load the database on the standby database server. Use the ASE command `load database` in the standby database server to load the dump.

5. Apply the necessary transaction log dumps to the standby database with the ASE command `load transaction`.

6. Dump the final transaction log of the SAP database which contains the replication marker. Use the ASE command `dump transaction` in the primary database server to create the last dump of the ASE transaction log.

7. Load the last transaction log dump.

8. Bring the standby database online using the ASE command `online database` to make the database available for use.

9. Confirm the installer dialog. The database will be checked for the dump marker.

### Using Snapshot Materialization

It is possible to materialize the standby database by using a snapshot of the primary database files with the help of a hardware mirroring product.

The sequence for performing materialization using database device files is as follows:

1. The installer stops for manual materialization of the standby database. The primary database contains the necessary replication markers at this time.
2. Quiesce the primary database.
   Use the ASE command `quiesce database` to freeze the database by suspending all disk write activities.
3. Generate a snapshot of the database files. The action to be performed depends on the hardware mirror product you are using. You could also just copy the files, use shared storage or FTP to make a copy of the dump file available at the standby site.
4. Unquiesce the primary database.
   Use the ASE command `quiesce database ... release` to enable disk write activities on the primary database again.
5. Load the standby database with the snapshot files.
   Use the ASE command `mount database` in the standby database to mount the database content.
6. Bring the database online using the ASE command `online database` in the standby database server to make the database available for use.
7. Confirm the installer dialog. The database will be checked for the dump marker.

### 7.5 Starting and Stopping the DR Agent and the Replication Server

To be able to stop and start the DR agent and the replication server, you must have the credentials of OS user `syb<dbsid>`.
ASE, the DR agent and the replication server can also be started and stopped using `startdb`, `stopbd`, `sapdbctrl`, or `saphostctrl`. For more information, see SAP Note 1899185: SAP ASE and SAP Replication Server: startdb & stopdb.

Connecting to the DR Agent

Although there are two DR agents (one in primary and another in the standby environment), you will only need to enter commands at one of the DR agents. The DR agents can connect to each other in order to share configuration information or to execute any activity that requires local access to the host. To set up and monitor replication, log on to the DR agent on the primary environment.

Use the DR agent’s host and port and the DR agent administrator’s security credentials to establish a connection to the DR agent. The following example illustrates the use of ISQL to connect to the DR agent. Open a command shell for OS user `syb<dbsid>`:

```
isql -X -U DR_admin -S <hostname>:<DR agent port>
```

The DR agent does not store its own security credentials, but rather, enforces authentication by pass-through authentication to the database server, or replication server.

Starting the DR Agent

When the replication server instance is created, a Bourne shell script is defined that can be used to start the DR agent.

Example of a Bourne shell script which should be started as OS user `syb<dbsid>`:

```
. /sybase/<SID>_REP/.sh
/sybase/<SID>_REP/SCC-3_2/bin/scc.sh
```

Stopping the DR Agent

A Bourne shell script can be used to stop the DR agent.

Example of a Bourne shell script which should be started as OS user `syb<dbsid>`:

```
isql –X –U DR_admin –S <hostname>:<DR agent port> <<EOF
```

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise SAP ASE 15.7: Disaster Recovery Setup with SAP Replication Server
### Starting the Replication Server

When the replication server instance is created, a Bourne shell script is defined that can be used to start the replication server.

Example of a Bourne shell script that should be started as OS user syb<dbsid>:

```
# Example
/sybase/<SID>_REP/<SID>_REP_<sitename>/RUN_<SID>_REP_<sitename>.sh
```

### Stopping the Replication Server

Log on to the replication server and execute a `shutdown` command.

Example of a Bourne shell script that should be started as OS user syb<dbsid>:

```
# Example
isql -X -U DR_admin -S <hostname>:<replication server port> << EOF
<DR_admin password>
shutdown
go
EOF
```

### 7.6 Removing the Replication Environment

The installer provides installation options for teardown and removal of a replication environment.

Start with the uninstallation of the current primary environment. Otherwise database connects will be redirected and the installer will not be able to execute the necessary cleanup in the database.

As soon as the primary replication environment is removed, it is possible to uninstall the standby replication environment.
Choose the following installer options to disable replication and remove the replication software on the hosts running the replication servers.

![<SAP product>] > Software Lifecycle Options > Database Tools > SAP ASE > Database Replication > Removal of Replication Environment

Specify the kind of removal. Choose one of the following options:

- **Tear down replication system**
  - This option
    - disables replication in the ASE servers
    - stops the replication servers
    - deletes all directories and files created during setup, including the replication server instances
  
  Data that was replicated to the standby databases will not be modified. The databases on the primary and standby hosts will not be “unmarked” for replication. The state of the environment after teardown will allow the immediate recreation of the replication environment. Materialization will again be required after setup.

  **Note**
  
  You can only tear down the replication environment if the DR Agent is up and running.

- **Unmark databases for replication and remove replication software**
  - This option
    - unmarks the databases
    - drops the database users for replication
    - removes the replication software

  If the replication server was running on a separate host, it is possible to clean up remaining SAP standalone units using the installer option *Deleting an SAP System or Single Instances*. 
7.7 Integration of the SAP Replication Server into an OS Cluster Environment

Installing the SAP Replication Server on the same host as the SAP ASE database is not supported in an OS cluster environment. The only supported option is to install the SAP Replication Server on its own host as shown below:

![Diagram of OS Cluster Server Failover]

7.8 Defining Dependencies

Both resources for replication – the replication server and the DR agent resource – will have the same dependencies. Each will be dependent on:

- The shared disk resource(s)
- The IP Address handling resource

Use the appropriate commands for your cluster software to add these dependencies to both the replication server and DR agent resources.

**Note**

There is no dependency between the replication server and DR agent. They can execute independently of each other.
7.9 Defining Node Failure Criteria

Most cluster software allows the state of the different cluster resources to trigger an automatic fail-over from one node in the cluster to another. The replication server and DR agent resource availability should not be used to trigger cluster fail-over.

Since the replication server processing is considered part of the SAP ASE database solution, no separate fault monitoring is required. If your existing hardware server or ASE monitoring determines that fail-over should occur, this is sufficient for replication to participate. It is not suggested that you add replication availability as a monitor for cluster node or ASE availability.

A failure by either of the replication resources will not affect the availability of your SAP application. However, a failure of your ASE resources does affect your SAP application availability. It is recommended that node failure continue to be triggered by ASE, but not include replication availability.
8 SAP ASE 16.0: Disaster Recovery Setup with SAP Replication Server

8.1 Disaster Recovery Setup with SAP Business Suite on SAP ASE 16.0

The Disaster Recovery setup for SAP ASE 16.0 offers the following replication modes:

- Synchronous Replication (Hot Standby)
- Near-Synchronous Replication (Hot Standby)
- Asynchronous Replication (Warm Standby)

SAP recommends to always install the latest versions of SAP ASE and of the SAP Replication Server. For more information on the latest versions and the certified combinations of SAP ASE and SAP Replication Server, see SAP Note 1891560.

The DR setup with SAP ASE 16.0 provides additional features for monitoring the SAP Replication Server using the Replication Management Agent (RMA).

You can install the SAP Replication Server on the same host as SAP ASE 16.0 (co-located scenario).

For more information, see the HADR Users Guide for SAP ASE 16.0, Chapter 4, Installing HADR for SAP Business Suite and SAP Note 1891560, section Additional Information.
9 Additional Information

9.1 Additional Information

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

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

Preparation

- Integration of LDAP Directory Services [page 167]
- Preparing an External ABAP System as Source for User Data [page 80]

Installation

- Installing the Host Agent Separately [page 174]

Post-Installation

- Starting and stopping SAP System Instances [page 176]
- If you decided to use a generic LDAP directory, you have to create a user for LDAP directory access [page 181]
- Heterogeneous SAP System Installation [page 182]

Deleting an SAP System or SAP Instance

- Deleting an SAP System [page 183]
9.2 Integration of LDAP Directory Services

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

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**.

**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.

- 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>
</tbody>
</table>
### Operating System

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Required Software</th>
</tr>
</thead>
<tbody>
<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](https://archive.sap.com/documents/docs/DOC-14384) at:

- 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`.  

---

**Additional Information**

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.3 to 7.5 on UNIX: SAP Adaptive Server Enterprise
• 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:

**SAP Release and SAP Library Quick Link**

<table>
<thead>
<tr>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAP NetWeaver 7.3</strong>&lt;br&gt;<a href="http://help.sap.com/nw73">http://help.sap.com/nw73</a></td>
</tr>
<tr>
<td><strong>SAP NetWeaver 7.3 including Enhancement Package 1</strong>&lt;br&gt;<a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
</tr>
<tr>
<td><strong>SAP NetWeaver 7.4</strong>&lt;br&gt;<a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
</tr>
<tr>
<td><strong>SAP NetWeaver 7.5</strong>&lt;br&gt;<a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></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**<br>**Preparations**<br>**LDAP Registration**<br>**Active Directory Configuration**<br>For more information about running the installer on Windows, see the documentation **Installation of SAP Systems Based on the Application Server**<br>**Stack**<br>**Release** on Windows:<br>**Database** at https://support.sap.com/sitoolset<br>**System Provisioning**<br>**Installation Option of Software Provisioning Manager 1.0**

**Note**

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

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

- **Configuration Tasks for Generic LDAP Directories on Windows**
  To configure other LDAP directories, refer to the documentation of your directory vendor. The installer software contains schema extensions for directory servers Netscape/iPlanet (ldregexns4.txt, ldregexns5.txt) and OpenLDAP slapd (ldregslapd.schema). Both files are located in the directory <Unpack_Directory>COMMON\ADS. After you have applied the schema extension, you need to create a root container to store the SAP-related information and create a directory user that the SAP application server can use to write information to the directory.
For more information about how to set up a Netscape/iPlanet directory server, see the documentation SAP System Information in Directory Services at: https://archive.sap.com/documents/docs/DOC-14384

- **Enabling the SAP System LDAP Registration**
  Once you have correctly configured your directory server, you can enable the LDAP registration of the SAP system by setting some profile parameters in the default profile.
  To do this, run the installer [page 107] 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.

9.3 **Preparing an External ABAP System as Source for User Data**

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

**Prerequisites**

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

**Context**

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

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

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

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

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

→ Recommendation
For security reasons, we recommend the first approach.

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

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

SAP Release and SAP Library Quick Link

- SAP 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 AS for ABAP 7.51 innovation package
  https://help.sap.com/nw751abap
- SAP NetWeaver AS for ABAP 7.52
  https://help.sap.com/nw752abap

SAP Library Path (Continued)

- Application Help
- SAP NetWeaver Library: Function-Oriented View
- Security
- Identity Management
- User Management of SAP NetWeaver AS for Java
- Configuring User Management
- UME Data Sources
- User Management of Application Server ABAP as Data Source
Procedure

- The following procedures describe the activities you have to perform in the existing ABAP system and for the Java system to be installed.

- Perform the following steps in the existing ABAP system:
  a. Call transaction PFCG to do the following:
     ○ Check that the roles SAP_BC_JSF_COMMUNICATION and SAP_BC_JSF_COMMUNICATION_RO exist and make sure that their profiles are generated.
     ○ Check that the roles SAP_J2EE_ADMIN, SAP_J2EE_GUEST, and SAP_BC_FP_ICF exist. Neither role contains any ABAP permissions, so you do not need to generate any profiles.
  b. Call transaction SU01 to do the following:
     ○ Create a new communication user and assign it to the role SAP_BC_JSF_COMMUNICATION_RO. We recommend that you do the following:
       ○ Name this user SAPJSF. You can use any password.
       ○ Assign this user the role SAP_BC_JSF_COMMUNICATION_RO for read-only (display) access to user data with Java tools. If you intend to maintain user data (that is, to change, create, or delete users) with Java tools, you need to assign the role SAP_BC_JSF_COMMUNICATION instead.
       ○ Assign this user the type Communications under Logon data to make sure that it can only be used for communication connections between systems and not as a dialog user.
     ○ Create a new administrator user for the J2EE engine and assign it to role SAP_J2EE_ADMIN. We recommend that you name this user J2EE_ADMIN_<SAPSID Java_System>. You can use any password.
     ○ Create a new guest user for the J2EE engine and assign it to role SAP_J2EE_GUEST. We recommend that you name this user J2EE_GUEST_<SAPSID Java_System>. You can use any password.
     Since this user is only used for anonymous access to the system, we recommend you to deactivate the password and, if required, lock it after installation to prevent anyone from using it for explicit named logons.
  c. Make sure that you change the initial passwords of these users and take the precautions described in the relevant SAP security guide before you start the installation of the Java system. You can find the security guide in the Security section of the product page for your SAP product at https://help.sap.com/.

- Perform the following steps in the Java System:
  a. Before the installation of the Java system, make sure that you have the correct user names and passwords of the users listed above for the separate ABAP system.
  b. During the installation of the Java system, make sure that you enter the correct users and passwords in the corresponding installer dialogs.
9.4 Installing the SAP Host Agent Separately

This procedure tells you how to install an SAP Host Agent separately.

Context

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

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

SAP Host Agent has the following executable programs and services:

- The SAPHostExec service
- The sapstartsrv service SAPHostControl
- The operating system collector saposcol

Note

The installed programs are automatically started when the host is booted.
The automatic start is ensured by the startup script sapinit, which starts the required executables.

The following procedure describes the steps you have to perform on the host where you install the SAP Host Agent separately.

Procedure

1. Check the hardware and software requirements on the installation host.
   The minimum requirements are as follows:
   - Hard Disk Space: 1 GB
   - RAM: 0.5 GB
   - Swap Space: 2 x RAM
2. Make sure that the sapadm user is created.
   During the installation, the 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>

**i Note**

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

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

*Only valid for 'Platform': AIX*

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

*End of 'Platform': AIX*

Groups and Members of the SAP Host Agent User

<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 and make sure that the required disk space is available for the directories to be created during the installation.

For more information, see Required File Systems and Directories [page 71].

4. Download and unpack the Software Provisioning Manager 1.0 archive on the host where you want to install the SAP Host Agent as described in Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 86].

5. Make the latest patch level of the `SAPHOSTAGENT <Version>.SAR` available on the host where you want to install the SAP Host Agent.

Download it from the following path: https://launchpad.support.sap.com/#/softwarecenter SUPPORT PACKAGES & PATCHES By Category SAP Technology Components SAP HOST AGENT SAP HOST AGENT 7.21 <Operating System>

**i Note**

The signature of installation archives is checked automatically by the installer [page 107] 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.

→ 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 107] and choose Generic 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.
   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>Application Help Function-Oriented View: English</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td></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>
<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>
</tbody>
</table>

9.5 Starting and Stopping SAP System Instances

Start or stop SAP system instances in one of the following ways:

• Using the SAP Management Console (SAP MC) [page 177]
• Using commands [page 180].
9.5.1 Starting and Stopping SAP System Instances Using the SAP Management Console

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

Prerequisites

- Make sure that the host names defined in the DNS server match the names of the SAP system instance hosts. In particular, keep in mind that host names are case-sensitive. For example, if the names of the SAP system instance hosts are in upper case, but the same host names are defined in the DNS server in lower case, starting and stopping the system does not work.
- If you want to start or restart remote systems or instances, make sure that you have registered them in the SAP Management Console (SAP MC). You do not need to register SAP systems or instances installed on the local host, because the SAP MC displays them automatically.
- The SAP Host Agent is installed on the host where the application server of the SAP system or instance runs.
- You have installed Java Runtime Environment (JRE) 5.0 or higher.
- Your Web browser supports Java.
- Your Web browser’s Java plug-in is installed and enabled to run scripting of Java applets.

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>
</table>
| ○ SAP NetWeaver 7.3  
  [http://help.sap.com/nw73](http://help.sap.com/nw73) | [Application Help] [Function-Oriented View: English] |
| ○ SAP NetWeaver 7.3 including Enhancement Package 1  
| ○ SAP NetWeaver 7.4  
| ○ SAP NetWeaver 7.5  
| ○ SAP NetWeaver AS for ABAP 7.52  
  [https://help.sap.com/nw752abap](https://help.sap.com/nw752abap) |
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 SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ SAP NetWeaver 7.3</td>
<td><img src="#" alt="Application Help" /> <img src="#" alt="Function-Oriented View: English" /></td>
</tr>
<tr>
<td><img src="#" alt="http://help.sap.com/nw73" /></td>
<td><img src="#" alt="Solution Life Cycle Management" /> <img src="#" alt="SAP Microsoft Management Console: Windows" /></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td><img src="#" alt="http://help.sap.com/nw731" /></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.4</td>
<td><img src="#" alt="http://help.sap.com/nw74" /></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.5</td>
<td><img src="#" alt="http://help.sap.com/nw75" /></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](#)

   **Example**

   If the instance number is 53 and the host name is saphost06, you enter the following URL:

   ![http://saphost06:55313](#)

   This starts the SAP MC Java applet.

   **Note**

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

2. Choose **Start**.

   The SAP Management Console (SAP MC) appears.

   By default, the instances installed on the host you have connected to are already added in the SAP MC.

   **Note**

   If the instances have not been added or if you want to change the configuration to display systems and instances on other hosts, you have to register your system manually. This is described in Registering Systems and Instances in the SAP Management Console below.

**Starting SAP Systems or Instances**

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

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

**i Note**

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user `<sapsid>adm`.

**Starting SAP System Instances Successively**

If you need to start the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Start the database instance.
2. Start the central services instance `SCS<Instance_Number>`.
3. Start the primary application server instance `J<Instance_Number>`.
4. Start additional application server instances `J<Instance_Number>`, if there are any.

**Stopping SAP Systems or Instances**

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

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

**i Note**

The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions.

Log in as user `<sapsid>adm`.

**Stopping SAP System Instances Successively**

If you need to stop the instances of an SAP system successively – for example when you want to start a distributed or a high-availability system – proceed as follows:

1. Stop additional application server instances `J<Instance_Number>`, if there are any.
2. Stop the primary application server instance `J<Instance_Number>`.
3. Stop the central services instance `SCS<Instance_Number>`.
4. Stop the database instance.
9.5.2 Starting and Stopping SAP System Instances Using Commands

Prerequisites

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

Context

**iNote**
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.

### 9.6 Creating a User for LDAP Directory Access

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

#### Prerequisites

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

#### Context

For more information, see Integration of LDAP Directory Services [page 167].
Procedure

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

   ![Example](image)

   The following is an example of an entry to create an LDAP Directory User:
   ```
   CN=sapldap,CN=Users,DC=nt5,DC=sap-ag,DC=de
   ```

9.7 Heterogeneous SAP System Installation

This section provides information on the installation of an SAP system in a heterogeneous system landscape. "Heterogeneous system landscape" means that application servers run on different operating systems.

See SAP Note [1067221](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

9.8 Enabling SSL Encrypted Data Transfer

Secure Sockets Layer (SSL) encrypted data transfer is available for SAP ASE 16.0 SP02 starting with PL6.

For general limitations and prerequisites refer to SAP Note [2481596](https://support.sap.com) - SYB: Encrypted data transfer between SAP System and SAP ASE database.

The SAP installer offers the possibility to enable the SSL encrypted data transfer via a checkbox. The SSL certificates are generated by the SAP installer and enabled for the database server and the SAP application server.

There are no manual steps necessary to configure the usage of SSL for the purpose of encrypted data transfer.

![Note](image)

The SAP installer adds the profile parameter `dbs/syb.ssl = 1` to the SAP System DEFAULT profile and configures the environment variable `dbs_syb_ssl = 1` for the OS user `<sid>adm`.

The SAP ASE interface file contains the keyword `ssl` in the TCP/IP connection string.
9.9 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.
- 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 107].
2. On the Welcome screen, choose:
   - Generic Installation Options
   - 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 reside on the same host) in one installer run.</td>
</tr>
<tr>
<td>Distributed or high-availability system</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>1. Additional application server instances, if there are any</td>
<td></td>
</tr>
<tr>
<td>2. Primary application server instance</td>
<td></td>
</tr>
<tr>
<td>3. Database instance</td>
<td>Since the installer only stops local instances automatically, make sure that before deleting the database instance of a distributed system, you stop all remaining instances. You must stop the instance with the message server only after having entered all installer parameters for the deletion of the database instance.</td>
</tr>
<tr>
<td>4. Central services instance (SCS)</td>
<td></td>
</tr>
<tr>
<td><strong>Caution</strong></td>
<td>Do not select checkbox <strong>Uninstall all instances of the SAP system from this host</strong> if you do not want to uninstall the complete SAP system or standalone engine. For example, do not select this checkbox if you only want to uninstall an additional application server instance of an existing SAP system distributed over several hosts. Otherwise the contents of mounted global directories under <code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/</code>, such as instance profiles and kernel executables, are also deleted.</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>
### Deletion of Additional Application Server

If you want to delete additional application server instances of an existing SAP system, you have to run the installer to delete them **locally** on each additional application server instance host.

### Standalone SAP Host Agent

The SAP Host Agent is automatically uninstalled from a host together with the last remaining SAP system instance.

If you want to uninstall a **standalone** SAP Host Agent, deselect **Profiles Available** and select **Uninstall Standalone SAP Host Agent** on the **General SAP System Parameters** screen.

---

<table>
<thead>
<tr>
<th>Deletion of</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional application server</td>
<td>If you want to delete additional application server instances of an existing SAP system, you have to run the installer to delete them <strong>locally</strong> on each additional application server instance host.</td>
</tr>
<tr>
<td>Standalone SAP Host Agent</td>
<td>The SAP Host Agent is automatically uninstalled from a host together with the last remaining SAP system instance.</td>
</tr>
<tr>
<td></td>
<td>If you want to uninstall a <strong>standalone</strong> SAP Host Agent, deselect <strong>Profiles Available</strong> and select <strong>Uninstall Standalone SAP Host Agent</strong> on the <strong>General SAP System Parameters</strong> screen.</td>
</tr>
</tbody>
</table>

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.

A  Appendix

A.1  Online Information from SAP

More information is available online as follows:

<table>
<thead>
<tr>
<th>Title</th>
<th>Internet Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Adaptive Server Enterprise</td>
<td></td>
</tr>
<tr>
<td>Server Enterprise</td>
<td></td>
</tr>
</tbody>
</table>
Important Disclaimers and Legal Information

Hyperlinks

Some links are classified by an icon and/or a mouseover text. These links provide additional information.

About the icons:

- Links with the icon 🌐: You are entering a Web site that is not hosted by SAP. By using such links, you agree (unless expressly stated otherwise in your agreements with SAP) to this:
  - The content of the linked-to site is not SAP documentation. You may not infer any product claims against SAP based on this information.
  - SAP does not agree or disagree with the content on the linked-to site, nor does SAP warrant the availability and correctness. SAP shall not be liable for any damages caused by the use of such content unless damages have been caused by SAP’s gross negligence or willful misconduct.

- Links with the icon 🔐: You are leaving the documentation for that particular SAP product or service and are entering a SAP-hosted Web site. By using such links, you agree that (unless expressly stated otherwise in your agreements with SAP) you may not infer any product claims against SAP based on this information.

Beta and Other Experimental Features

Experimental features are not part of the officially delivered scope that SAP guarantees for future releases. This means that experimental features may be changed by SAP at any time for any reason without notice. Experimental features are not for productive use. You may not demonstrate, test, examine, evaluate or otherwise use the experimental features in a live operating environment or with data that has not been sufficiently backed up.

The purpose of experimental features is to get feedback early on, allowing customers and partners to influence the future product accordingly. By providing your feedback (e.g. in the SAP Community), you accept that intellectual property rights of the contributions or derivative works shall remain the exclusive property of SAP.

Example Code

Any software coding and/or code snippets are examples. They are not for productive use. The example code is only intended to better explain and visualize the syntax and phrasing rules. SAP does not warrant the correctness and completeness of the example code. SAP shall not be liable for errors or damages caused by the use of example code unless damages have been caused by SAP’s gross negligence or willful misconduct.

Gender-Related Language

We try not to use gender-specific word forms and formulations. As appropriate for context and readability, SAP may use masculine word forms to refer to all genders.