Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.02 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
   - New Features - Software Provisioning Manager 1.0 SP22 ............ 13
   - New Features - Software Provisioning Manager 1.0 SP21 and Lower 13

## 2 Installation Options Covered by this Guide
2.1 Central System ..................................................................... 15
2.2 Distributed System ............................................................ 16
2.3 High-Availability System ...................................................... 17
2.4 Dialog Instance .................................................................... 18
2.5 SAP Host Agent as a Separate Installation ............................. 21

## 3 Planning
3.1 Planning Checklist ............................................................ 22
3.2 Hardware and Software Requirements ................................. 23
3.3 Planning User and Access Management ............................... 36
3.4 Basic Installation Parameters .............................................. 37
3.5 SAP System Parameters ..................................................... 38
3.6 SAP System Database Parameters ....................................... 47
3.7 SAP System Transport Host ............................................... 47
3.8 Planning the Switchover Cluster for High Availability .......... 48

## 4 Preparation
4.1 Preparation Checklist ....................................................... 51
4.2 Creating Operating System Users and Groups ..................... 52
4.3 Required File Systems and Directories ................................. 56
4.4 Using Virtual Host Names .................................................. 65
4.5 Performing Switchover Preparations for High Availability .... 65
4.6 Preparing the Installation Media .......................................... 66
4.7 Downloading and Extracting the Software Provisioning Manager 1.0 Archive .................................................. 66
Using the Physical Media from the Installation Package............................... 68
Downloading Installation Media................................................................. 70

5 Installation ......................................................................................... 72
5.1 Installation Checklist ................................................................. 72
5.2 Exporting and Mounting the Transport Directory ......... 76
5.3 Exporting and Mounting Global Directories ......................... 77
5.4 Specifying the Initial Data Source of the User Management Engine.... 79
5.5 Prerequisites for Running the Installer ......................................... 80
5.6 Running the Installer .................................................................... 83
5.7 Additional Information About the Installer ................................. 87
   Useful Information About the Installer .................................................. 87
   Interrupted Processing of the Installer ................................................ 89
   Entries in the Services File Created by the Installer ............................. 91
   Troubleshooting with the Installer ...................................................... 92
   Using the Step State Editor (SAP Support Experts Only) ..................... 93

6 Post-installation ................................................................................. 95
6.1 Post-Installation Checklist ......................................................... 95
6.2 Logging On to the Application Server Java .................................. 96
6.3 Logging On to SAP NetWeaver Portal ......................................... 98
6.4 Logging On to the SAP NetWeaver Development Infrastructure (NWDI) .... 99
6.5 Providing Access to the SAP NetWeaver Administrator ............... 100
6.6 Installing the SAP License ........................................................... 101
6.7 High Availability: Setting Up Licenses ........................................ 101
6.8 Configuring Remote Connection to SAP Support ....................... 103
6.9 Connecting the System to SAP Solution Manager ....................... 103
6.10 Applying the Latest Kernel and Support Package Stacks .................. 105
6.11 Dialog Instances in a Heterogeneous UNIX Environment only: Updating the Kernel .... 106
6.12 Configuring User Management .................................................... 106
6.13 Ensuring User Security ............................................................... 107
6.14 Running the Configuration Wizard ............................................. 112
6.15 Post-Installation Steps for the J2EE Adapter Engine (Optional Standalone Unit) ...... 113
   Configuring the SLD Data Supplier Service in the Visual Administrator .... 113
   Configuring the Gateway Service of the Central Integration Server .......... 114
   Adding Connection Parameters to Central Exchange Profile ......... 115
6.16 Post-Installation Steps for the PCK (Optional Standalone Unit) .......... 116
   Configuring the PCK .................................................................... 116
   Starting the PCK .................................................................... 117
   Changing Passwords for User Management (UME) ............................ 117
6.17 Enabling the Database ............................................................... 118
6.18 Performing a Full Installation Backup ....................................... 119
7  SAP ASE 15.7: Disaster Recovery Setup with SAP Replication Server ......................... 121
  7.1  Disaster Recovery Setup with SAP Replication Server ..................................... 121
  7.2  Implementation Considerations ................................................................. 123
  7.3  Prerequisites ............................................................................................... 123
  7.4  Installing the Replication Environment ......................................................... 125
      Co-Located Replication Topology: Central Instance at the Primary Site ............ 125
      Co-Located Replication Topology: Central Instance on a Separate Server ....... 127
      Dis-Located Replication Topology: Central Instance on a Separate Server ....... 129
      Materializing Databases ............................................................................. 132
  7.5  Starting and Stopping the DR Agent and the Replication Server ..................... 134
  7.6  Removing the Replication Environment ......................................................... 136
  7.7  Integration of the SAP Replication Server into an OS Cluster Environment ....... 137
  7.8  Defining Dependencies .................................................................................. 138
  7.9  Defining Node Failure Criteria ...................................................................... 138

8  SAP ASE 16.0: Disaster Recovery Setup with SAP Replication Server .................. 139
  8.1  Disaster Recovery Setup with SAP Replication Server ..................................... 139

9  Additional Information ....................................................................................... 140
  9.1  Integration of LDAP Directory Services ......................................................... 140
  9.2  Preparing an External ABAP System as Source for User Data ...................... 144
  9.3  Exporting and Mounting Directories via NFS ................................................. 147
      Exporting and Mounting Directories via NFS for AIX .................................... 148
      Exporting and Mounting Directories via NFS for HP-UX .............................. 149
      Exporting and Mounting Directories via NFS for Linux ............................... 149
      Exporting and Mounting Directories via NFS for Oracle Solaris .................. 151
  9.4  Dialog Instance Installation for an Upgraded System only: Updating Profiles ... 153
  9.5  Installation of Additional Usage Types or Software Units in an Existing SAP System ................................................................. 154
  9.6  Installing the SAP Host Agent Separately ..................................................... 155
  9.7  Starting and Stopping SAP System Instances ................................................ 158
      Starting and Stopping SAP System Instances Using the SAP Management Console ................................................................. 158
      Starting and Stopping SAP System Instances Using Commands ................. 162
  9.8  Creating a User for LDAP Directory Access .................................................. 163
  9.9  Usage Type-Specific Initial Technical Configuration Done by the Installer ....... 164
      Initial Technical Configuration for SAP NetWeaver Application Server for Java (AS Java) ................................................................. 164
      Initial Technical Configuration for Development Infrastructure (DI) .......... 167
      Initial Technical Configuration for the Portal (Usage Types EPC and EP) .... 169
      Initial Technical Configuration for BI Java .................................................. 170
  9.10 Heterogeneous SAP System Installation ....................................................... 172
  9.11 Verifying and Adjusting the instanceID of an AS Java Instance ..................... 172
  9.12 Troubleshooting for Portal Installation ........................................................ 175
  9.13 Deleting an SAP System or Single Instances ............................................... 176
A

Appendix. ................................................................. 179
A.1 Online Information for SAP Applications on SAP Adaptive Server Enterprise. .................. 179
**Document History**

*i* **Note**

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

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 Replication Server][139]. |
| 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: [Downloading the Software Provisioning Manager Archive][1]. |
<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 user graphical interface (GUI) “SL Common GUI”, documented in: Prerequisites for Running the Installer, Running the Installer, Useful Information About the Installer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Cleanup of operating system users, documented in: SAP System Parameters, Creating Operating 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 Installation Media</td>
</tr>
</tbody>
</table>
Updated version for software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)

- **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*

- **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.

- **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) added to section Additional Information About the Installer.**
1 About this Document

This installation guide describes how to install an SAP system based on the application server **Java** of SAP NetWeaver 7.0 EHP2 using the installation tool Software Provisioning Manager 1.0 SP22 ("installer" for short), which is part of SL Toolset 1.0 SP22.

**Note**

SAP NetWeaver 7.0x Java Application Server reached end of maintenance by the end of 2017. SAP recommends upgrading to a more recent version. For more information, see SAP Note 1648480.

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 [https://support.sap.com/pam](https://support.sap.com/pam).

**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 Virtualization Management. For more information, see SAP Note 1709155 and [https://help.sap.com/lama](https://help.sap.com/lama).

**Note**

Note that for some products - such as SAP NetWeaver 7.0 - a complete system installation is only available for the highest support release. As for the lower support releases, only options for system copy and additional application server instances are provided.

**Caution**

Make sure you have read the *Before You Start* section before you continue with this installation guide.

**Related Information**

- Naming Conventions [page 10]
- Constraints [page 10]
- Before You Start [page 11]
- SAP Notes for the Installation [page 11]
- New Features [page 12]
1.1 Naming Conventions

- Software Provisioning Manager 1.0 is the successor of the product- and release-specific delivery of provisioning tools, such as “SAPinst”.
  Before you perform an installation from scratch or a target system installation in the context of a system copy, we strongly recommend that you always download the latest version of the Software Provisioning Manager 1.0 which is part of the Software Logistics Toolset 1.0 (“SL Toolset” for short). For more information, see Preparing the Installation Media [page 66].
  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 http://scn.sap.com/docs/DOC-30236.
  “SAPinst” has been renamed to “Software Provisioning Manager” (“installer” for short) in this documentation, but the terms “SAPinst” and “sapinst” are still used in:
  ○ The name of the technical framework of Software Provisioning Manager. For more information about the SAPinst Framework, see SAP Note 2393060.
  ○ Texts and screen elements in the Software Provisioning Manager GUI
  ○ Names of executables, for example sapinst
  ○ Names of command line parameters, for example SAPINST_USE_HOSTNAME
  ○ Names of operating system user groups, such as the additional group sapinst
- “installer” refers to Software Provisioning Manager.
- “SAP system” refers to SAP system based on the application server of SAP NetWeaver 7.0 / 7.0 including Enhancement Package 1 / 7.0 including Enhancement Package 2 / 7.0 including Enhancement Package 3.
- “Java system” refers to SAP system based on the application server Java of SAP NetWeaver 7.0 / 7.0 including Enhancement Package 1 / 7.0 including Enhancement Package 2.
- “Diagnostics” refers to diagnostics in SAP Solution Manager.
- “Diagnostics Agent” refers to the agent of diagnostics in SAP Solution Manager.

1.2 Constraints

You need to consider the following constraints before you start your installation:

- Your operating system platform must be 64-bit.
- The SAP Adaptive Server Enterprise Cluster Edition is not supported.
- Raw devices are not supported.
- Multiple SAP systems on one host 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 162].
1.3 Before You Start

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

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

You can find a printed version of the Master Guide in your installation package or you can download the latest version from http://help.sap.com.

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

Table 2:

<table>
<thead>
<tr>
<th>Title</th>
<th>Internet Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Including Enhancement Package&gt; Installation and Upgrade</td>
<td></td>
</tr>
</tbody>
</table>

1.4 SAP Notes for the Installation

You must read the following SAP Notes before you start the installation. These SAP Notes contain the most recent information on the installation, as well as corrections to the installation documentation. Make sure that you have the up-to-date version of each SAP Note, which you can find at https://support.sap.com/notes

Table 3: 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>1554717</td>
<td>Planning Information for SAP Applications on SAP ASE</td>
<td>SAP release information for customers deploying SAP applications on SAP ASE</td>
</tr>
<tr>
<td>1558958</td>
<td>SYB: DBA Cockpit Correction Collection SAP Basis 7.02/7.03</td>
<td>The implementation of SAP Note 1558958 directly after the installation is strongly recommended.</td>
</tr>
<tr>
<td>SAP Note Number</td>
<td>Title</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1585981</td>
<td>SYB: Backup Instructions for SAP on SAP ASE</td>
<td>Information about backup and recovery</td>
</tr>
<tr>
<td>1650511</td>
<td>SYB: High Availability Offerings with SAP ASE</td>
<td>Information about high availability cluster solutions for SAP ASE</td>
</tr>
<tr>
<td>73606</td>
<td>Supported Languages and Code Pages</td>
<td>Information on possible languages and language combinations in SAP systems</td>
</tr>
<tr>
<td>737368</td>
<td>Hardware requirements of Java Development Infra­</td>
<td>Information on the hardware requirements for usage type Development Infra­</td>
</tr>
<tr>
<td></td>
<td>structure (DI), which depends on the size of your</td>
<td>structure (DI), which depends on the size of your development</td>
</tr>
<tr>
<td></td>
<td>development team.</td>
<td>team.</td>
</tr>
<tr>
<td>1972803</td>
<td>SAP on AIX: Recommendations</td>
<td>This SAP Note contains recommendations and clarifications for many topics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>relevant for SAP on AIX.</td>
</tr>
<tr>
<td>2369910</td>
<td>SAP Software on Linux: General information</td>
<td>This SAP Note contains Linux-specific information about the SAP system in­</td>
</tr>
<tr>
<td></td>
<td></td>
<td>stallation.</td>
</tr>
<tr>
<td>1669684</td>
<td>SAP on Oracle Solaris 11</td>
<td>This SAP Note contains information and references to SAP Notes relevant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for Solaris 11.</td>
</tr>
<tr>
<td>1067221</td>
<td>Composite SAP Note for heterogeneous installation</td>
<td>This SAP Note and its related SAP Notes describe the released operating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>system and database combinations for heterogeneous SAP systems landscapes.</td>
</tr>
</tbody>
</table>

1.5 New Features

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


New Features - Software Provisioning Manager 1.0 SP22 [page 13]

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

New Features - Software Provisioning Manager 1.0 SP21 and Lower [page 13]

The table in this section provides an overview of the new features in Software Provisioning Manager 1.0 available as of SP21 (SL Toolset 1.0 SP21) and lower.
1.5.1 New Features - Software Provisioning Manager 1.0 SP22

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


Table 4:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installer Log Files Improvements</td>
<td>Installer log files are now available immediately after the installer has been started, that is before a product has been selected on the Welcome screen. For more information, see Useful Information About the Installer [page 87] and Troubleshooting with the Installer [page 92].</td>
</tr>
</tbody>
</table>

1.5.2 New Features - Software Provisioning Manager 1.0 SP21 and Lower

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


Table 5:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Signature Check</td>
<td>The signature of media is checked automatically by the installer during the Define Parameters phase while processing the Media Browser screens. As of now the installer only accepts media whose signature has been checked. See also the description of this new security feature in SAP Note 2393060. For more information, see Preparing the Installation Media [page 66] and Running the Installer [page 83].</td>
</tr>
<tr>
<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) &quot;SL Common GUI&quot;. For more information, see Useful Information About the Installer [page 87], Running the Installer [page 83].</td>
</tr>
<tr>
<td></td>
<td></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 38].</td>
</tr>
</tbody>
</table>

Software Provisioning Manager 1.0 SP21 (SL Toolset 1.0 SP21)

Software Provisioning Manager 1.0 SP20 (SL Toolset 1.0 SP20)
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<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 66). 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>Diagnostics Agent</td>
<td>The Diagnostics Agent is no longer installed automatically with the SAP system. The <strong>Install Diagnostics Agent</strong> check box on the <strong>Install Diagnostics Agent</strong> 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>Feedback Evaluation Form available in the Software Provisioning Manager:</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 the Prerequisites section in [Running the Installer](page 83).</td>
<td>Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
</tbody>
</table>
2 Installation Options Covered by this Guide

This section shows the installation options covered by this 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.

Related Information

Central System [page 15]
Distributed System [page 16]
High-Availability System [page 17]
Dialog Instance [page 18]
SAP Host Agent as a Separate Installation [page 21]

2.1 Central System

You can install a central system on a single host.

Note

You can install the following optional standalone units only as a central system, but not as a distributed or high-availability system:

- Application Sharing Server
- J2EE Adapter Engine
- Partner Connectivity Kit

These are the following instances:

- Central services instance (SCS instance)
- Database instance (DB instance)
- Central instance

Additionally, you can install one or more dialog instances. For more information, see Dialog Instance [page 18].

The following figure shows an example of SAP instances in a central system.
2.2 Distributed System

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

These are the following instances:

- Central services instance (SCS instance)
- Database instance (DB instance)
- Central instance

**Note**

You can also use the SAP transport host or the SAP global host as your central instance host.

Optionally, you can install one or more dialog instances. For more information, see *Installation of a Dialog Instance [page 18]*.

**Note**

You can install the following **optional standalone units** only as a central system [page 15], but not as a distributed or high-availability system:

- Application Sharing Server
- J2EE Adapter Engine
- Partner Connectivity Kit

The following figure assumes the following:

- The SCS instance runs on the SAP global host. The SAP global host is the host where the global file system `/<sapmnt>` resides. For more information, see *SAP Directories [page 56]*.
- The global transport directory resides on a separate SAP transport host. For more information, see *SAP Transport Host [page 47]*.
2.3 High-Availability System

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

These are the following instances:

- Central services instance for Java (SCS instance)
- Enqueue replication server instance (ERS instance) for the SCS instance
- Database instance
- Central 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 dialog instances on hosts different from the central instance host. For more information, see Installation of a Dialog Instance [page 18].

**Note**

You can install the following optional standalone units only as a central system [page 15], but not as a distributed or high-availability system:

- Application Sharing Server
- J2EE Adapter Engine
- Partner Connectivity Kit

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

- The SCS instance and its related ERS instance run on the switchover cluster infrastructure. For more information, see Setting Up File Systems for a High-Availability System [page 61].
- The global transport directory resides on a separate SAP transport host. For more information, see SAP Transport Host [page 47].

2.4 Dialog Instance

You can install one or more dialog instances for an existing SAP system. Dialog instances are optional and can be installed on separate hosts.

A dialog instance can run on:

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

**Note**

If you install a dialog instance in an existing non-Unicode system (that has been upgraded to the current release), the dialog instance is automatically installed as a non-Unicode instance. The installer determines if a non-Unicode system exists and chooses the correct executables for the system type.

**Note**

If you want to install dialog instances running on an operating system other than the central instance, see Heterogeneous SAP System Installation [page 172]. For example, you need to do this if your central instance runs on Linux for z System but the dialog instance is to run on Windows.
Dialog Instance for a Central System

The following figure shows a central system with dialog instances that run:

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

For more information, see Central System [page 15].
Dialog Instance for a Distributed System

For more information, see Distributed System [page 16].

Dialog Instance for a High-Availability System

The following figure shows a high-availability system with dialog instances that run on:

- The host of the central instance
- Dedicated hosts

This figure assumes the following:

- The SCS instance and its related ERS instance run on the switchover cluster infrastructure. For more information, see Setting Up File Systems for a High-Availability System [page 61].
- The global transport directory resides on a separate SAP transport host. For more information, see SAP Transport Host [page 47].
2.5 SAP Host Agent as a Separate Installation

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

SAP Host Agent is an agent that can accomplish several life-cycle management tasks, such as operating system monitoring, database monitoring, system instance control and provisioning. When you install a new SAP system or instance, the SAP Host Agent is in most cases installed automatically on the SAP system or instance host.

It is only required to install the SAP Host Agent separately if one of the following is true:

- There is no SAP system or instance on the host.
- The SAP system or instance running on the host has a kernel release lower than SAP kernel 7.20 and the host does not yet have an SAP Host Agent. During the installation of new SAP instances with SAP kernel 7.20 or higher, the SAP Host Agent is installed automatically (integrated installation).
- You have upgraded your SAP system to a release with a kernel release lower than SAP kernel 7.20 and the host of the upgraded system or instance does not yet have an SAP Host Agent.

The section Installing the SAP Host Agent Separately [page 155] describes how to perform the installation.
3  Planning

3.1  Planning Checklist

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

- Central, distributed, or high-availability system
- Dialog 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 15]).

Central, Distributed, or High-Availability System

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

You can install the optional standalone units J2EE Adapter Engine, Partner Connectivity Kit, Application Sharing Server only as a central system.

1. You check the hardware and software requirements for each installation host.
2. You plan how to set up user and access management [page 36].
3. You identify Basic SAP System Installation Parameters [page 37].
4. You plan the setup of your database layout.
5. You decide on the transport host to use [page 47].
6. To install a high-availability system, you read Planning the Switchover Cluster for High Availability [page 48].
7. Continue with Preparation [page 51].
Dialog Instance

1. You check the hardware and software requirements for the installation host on which you want to install one or more dialog instances.
2. You identify Basic SAP System Installation Parameters [page 37].
3. Continue with Preparation [page 51].

3.2 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 central 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 in one of two modes:
     - Standalone mode (optional) before the installation process
       For more information, see Running the Prerequisite Checker Standalone [page 24].
     - Integrated in the installer (mandatory) during the installation process
       For more information, see Running the Installer [page 83].

3. If you want to install a production system, the values provided by the Prerequisite Checker and the hardware and software requirements checklists are not sufficient. In addition, do the following:
   - You contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing depending on:
     - The set of applications to be deployed
     - How intensively the applications are to be used
     - The number of users

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.02 on UNIX: SAP Adaptive Server Enterprise

Planning
3.2.1 Running the Prerequisites Check in Standalone Mode (Optional)

When you install an SAP system, the installer automatically starts the prerequisites check, which 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 (OS) and the SAP instances before the actual installation.

Context

We recommend that you use both the Prerequisites Check and the requirements tables for reference.

Procedure

1. Download and unpack the Software Provisioning Manager 1.0 archive to a local directory and make the SAP kernel media available as described in Preparing the Installation Media [page 66].
2. Start the installer as described in Running the Installer [page 83].
3. On the Welcome screen, choose <Product> ➤ Software Life-Cycle Options ➤ Additional Preparation Options ➤ Prerequisites Check.
4. Follow the instructions in the installer dialogs and enter the required parameters.

   Note

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

5. To start the prerequisites check, choose Next.

Results

The Prerequisite Checker Results screen displays the results found. If required, you can also check the results in file prerequisite_checker_results.html, which you can find in the installation directory.
3.2.2 Requirements for the SAP System Hosts

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

**Note**

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

### Related Information

- General Installation Information for Your Operating System [page 25]
- Hardware Requirements [page 27]
- Software Requirements [page 31]
- Other Requirements [page 35]

### General Installation Information for Your Operating System

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

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIX</td>
<td>Before you start the installation, make sure that you have read SAP Note 1972803. In addition, we also recommend that you check the information available in the SAP on AIX space on the SAP Community Network at <a href="https://www.sap.com/community/topic/aix.html">https://www.sap.com/community/topic/aix.html</a>.</td>
</tr>
</tbody>
</table>
**Operating System** | **Information**
--- | ---
**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](#).

**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).
3.2.2.2 Hardware Requirements

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

Table 7: Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing units</td>
<td><strong>For application server instances and database instances:</strong> The number or physical or virtual processing units usable by the operating system image must be equal to or greater than 2.</td>
</tr>
<tr>
<td></td>
<td>Database Instance: All 64-bit processors that are capable of running the supported operating system versions for SAP ASE.</td>
</tr>
<tr>
<td></td>
<td>All other instances: 2 dual core CPUs or 4 single core CPUs.</td>
</tr>
<tr>
<td></td>
<td><strong>For an SCS instance running on a separate host:</strong> One physical or virtual processing unit usable by the operating system image might be sufficient.</td>
</tr>
<tr>
<td></td>
<td>Examples of processing units are processor cores or hardware threads (multithreading).</td>
</tr>
<tr>
<td></td>
<td>In a virtualized environment, ensure that adequate processor resources are available to support the workloads of the running SAP systems.</td>
</tr>
<tr>
<td>Requirement</td>
<td>Values and Activities</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hard disk space</td>
<td>- <strong>General requirements:</strong></td>
</tr>
<tr>
<td></td>
<td>○ 4.3 GB of temporary disk space for every required installation medium that you have to copy to a local hard disk. For more information, see Preparing the Installation Media [page 66].</td>
</tr>
<tr>
<td></td>
<td>○ 1.2 GB of temporary disk space for the installation.</td>
</tr>
<tr>
<td></td>
<td>○ 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.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Instance-specific requirements:</strong> If you install several instances on one host, you have to add up the requirements accordingly.</td>
</tr>
</tbody>
</table>
|                        |  ○ Central services instance (SCS instance)  
2 GB                                                                                                                                                                                                                       |
|                        |  ○ Enqueue replication server instance for the SCS instance (high-availability only)  
2 GB                                                                                                                                                                                                                       |
|                        |  ○ Database instance:  
  ○ Minimum 12 GB  
    Database Software: 4 GB  
    4.5 GB of temporary disk space for every required installation medium you have to copy to a local hard disk.                                                                                     |
|                        |    1.2 GB of temporary disk space for the installation.                                                                                                                                                               |
|                        |  ○ Note  
For safety reasons (system failure), the file systems must be physically distributed over several disks or RAID-technology must be used.                                                                        |
|                        |  ○ Central instance:  
    2 GB for the AS Java + up to 2 GB for each additional usage type or software unit you want to install.                                                                                                    |
|                        |  ○ Dialog instance:  
    2 GB for the AS Java + up to 2 GB for each additional usage type or software unit you want to install.                                                                                                    |
|                        |  ○ SAP Host Agent:  
    0.5 GB                                                                                                                                                                                                           |
### RAM

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

The following lists the RAM requirements for each 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
- Enqueue replication server instance for the SCS instance (high-availability only)
  - Minimum 1 GB
- Database instance:
  - 6 GB
- Central instance:
  - Minimum 8 GB (BW server: See also SAP Note [927530](#))
    - For more information about RAM required for usage type BI Java, see SAP Note [927530](#).
    - For more information about RAM required for usage type Development Infrastructure (DI), see SAP Note [737368](#).
- Dialog instance:
  - Minimum 8 GB (SAP NetWeaver BW server: See also SAP Note [927530](#))
- SAP Host Agent:
  - 1 GB

See SAP Note [1112627](#) for the commands to display the RAM size on HP-UX.

See SAP Note [1382721](#) for the commands to display the RAM size on Linux.

### AIX: Paging space

You need hard disk drives with sufficient paging space. Calculate the required paging space as follows:

- Optimistic strategy:
  - You need at least 20 GB for the **central instance** and at least another 10 GB for every **dialog instance**.
  - In addition, you need at least 20 GB for the **central instance** and at least another 10 GB for the **SCS instance** and also for every **dialog 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](#).
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| **HP-UX: Swap Space** | You need hard disk drives with sufficient space for swap. Calculate the required swap space as follows: 2 * RAM, at least 20 GB  
For more information about HP-UX swap space recommendations and about how to set up swap space, see SAP Note [1112627](https://support.sap.com). |
| **Linux: Swap Space** | You need hard disk drives with sufficient space for swap. Calculate the required swap space as follows: 2 * RAM, at least 20 GB  
We recommend that you use the amount of swap space as described in SAP Note [1597355](https://support.sap.com). 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. |
| **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://support.sap.com). |

**Verifying paging space size and kernel settings using memlimits**  
You can execute `memlimits` to verify paging space size and kernel settings 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/](https://launchpad.support.sap.com/).  
2. Make the `SAPEXE.SAR` archive available on the installation host. This archive is contained in the folder `K_<Kernel_Version>_ <U/N>_ <OS>/DBINDEP` of the installation media.  
3. To unpack the file `memlimits`, enter the following commands:  
   ```bash  
   SAPCAR -xvfg SAPEXE.SAR memlimits  
   ```  
4. Start `memlimits` using the following command:  
   ```bash  
   ./memlimits -l 20000  
   ```  
If you see error messages, increase the paging space and rerun `memlimits` until there are no more errors.
3.2.2.3 Software Requirements

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

Table 8: Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Database Software            | 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.) For more information about supported database platforms, check the Product Availability Matrix (PAM) at http://support.sap.com/pam.
| AIX: Operating System Version| Check the Product Availability Matrix (PAM) at http://support.sap.com/pam for supported operating system versions. Contact your OS vendor for the latest OS patches. Minimal OS requirements for the specific SAP Kernel releases are listed in SAP Note 1780629. You require at least AIX 6.1 TL7 SP10 to be able to run the installer. |
| ● SAP ASE 16.0 for Bus.Suite | AIX 7.2 AIX 7.1 TL 0 and higher To check the operating system version, enter the following command: oslevel -s |
| ● Sybase ASE 15.7 for Bus.Suite | AIX 7.1 requires a patch that fixes APARIV10828. Contact IBM directly to obtain the patch. |

Table 9: Required SPs

<table>
<thead>
<tr>
<th>AIX Level:</th>
<th>Required SP:</th>
<th>oslevel -s</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIX 7.1 TL0</td>
<td>SP8</td>
<td>7100-00-08-1241</td>
</tr>
<tr>
<td>AIX 7.1 TL 1</td>
<td>SP6</td>
<td>7100-01-06-1241</td>
</tr>
<tr>
<td>AIX 7.1 TL 2</td>
<td>SP2</td>
<td>7100-02-02-1316</td>
</tr>
</tbody>
</table>

AIX 7.1 requires a patch that fixes APARIV10828. Contact IBM directly to obtain the patch.
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| **HP-UX**: Operating System Version | 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:  
`uname -r`  
For information about support time frames of HP-UX, see SAP Note [939891](http://support.sap.com/939891).  
The following patches are required for HP-UX 11.31: PHSS_37493, PHSS_36352, PHKL_37802, PHKL_42687. |
| **Linux**: Operating System Version | 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:  
`cat /etc/*-release` |
| **Solaris**: Operating System Version | 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:  
`/bin/uname -r` |
| **HP-UX**: OS Patches | Contact your OS vendor for the latest OS patches.  
To check the minimum required OS patches, see SAP Note [837670](http://support.sap.com/837670).  
SAP only supports the use of native binaries. Always use the appropriate SAP binaries for your processor. |
| **Solaris**: OS Patches | Contact your OS vendor for the latest OS patches.  
Check the relevant SAP Note for required Solaris patches:  
- Oracle Solaris 10 on x64: SAP Note [908334](http://support.sap.com/908334)  
- Oracle Solaris 11: SAP Note [1797712](http://support.sap.com/1797712) |
| **AIX**: Kernel Parameters | To adjust the settings for asynchronous I/O (AIO) if the database is installed using file systems, see SAP Note [1972803](http://support.sap.com/1972803).  
To adjust AIX Virtual Memory Management settings, see SAP Note [973227](http://support.sap.com/973227). |
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| **HP-UX**: Kernel Parameters | To run an SAP system, make sure that you check and, if necessary, modify the HP-UX kernel.  

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

Proceed as follows:  

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

   ⚠️ Caution  
   If a kernel value is already larger than the one suggested in the SAP Note, do not automatically reduce it to match the SAP requirement.  
   
   You have to analyze the exact meaning of such a parameter and, if required, to reduce the parameter value. In some cases this might improve the performance of your SAP applications.  

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

| **Linux**: Kernel Parameters | Check SAP Note [2369910](https://www.sap.com) for Linux kernel versions certified by SAP.  

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

- RHEL6: SAP Note [1496410](https://www.sap.com)  
- RHEL7: SAP Note [2002167](https://www.sap.com)  
- SLES 11: SAP Note [1310037](https://www.sap.com)  
- SLES 12: SAP Note [1984787](https://www.sap.com) |

| **Solaris**: Kernel Parameters | To run an SAP system, you must check and, if necessary, modify the Solaris kernel parameters or resource controls.  

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

For more information about current Solaris kernel parameters and about how to modify them, see the relevant SAP Note:  

- Oracle Solaris 10: SAP Note [724713](https://www.sap.com)  
- Oracle Solaris 11: SAP Note [1797712](https://www.sap.com) |
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<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></td>
<td>You can check this as follows:</td>
</tr>
<tr>
<td></td>
<td>- Enter the following commands to check whether National Language Support (NLS) is installed:</td>
</tr>
<tr>
<td></td>
<td>swlist -v</td>
</tr>
<tr>
<td></td>
<td>The output should contain the string NLS-AUX ...</td>
</tr>
<tr>
<td></td>
<td>- Enter the following commands to check which locales are available:</td>
</tr>
<tr>
<td></td>
<td>locale -a</td>
</tr>
<tr>
<td></td>
<td>The following files must be available: de_DE.iso88591, en_US.iso88591.</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:</td>
</tr>
<tr>
<td></td>
<td>- Enter the following commands to check whether National Language Support (NLS) is installed:</td>
</tr>
<tr>
<td></td>
<td>swlist -v</td>
</tr>
<tr>
<td></td>
<td>The output should contain the string NLS-AUX ...</td>
</tr>
<tr>
<td></td>
<td>- Enter the following commands to check which locales are available:</td>
</tr>
<tr>
<td></td>
<td>locale -a</td>
</tr>
<tr>
<td></td>
<td>The following files must be available: de_DE.iso88591, en_US.iso88591.</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:</td>
</tr>
<tr>
<td></td>
<td>- Ensure that the required locales such as the following are available:</td>
</tr>
<tr>
<td></td>
<td>de_DE, en_US</td>
</tr>
<tr>
<td></td>
<td>- Check SAP Note 187864 for information about corrected operating system locales and SAP blended Code Pages.</td>
</tr>
<tr>
<td><strong>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:</td>
</tr>
<tr>
<td></td>
<td>locale -a</td>
</tr>
<tr>
<td></td>
<td>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>
<tr>
<td><strong>Linux</strong>: Activated Hardware Drivers</td>
<td>To check the activated hardware drivers, enter the following command:</td>
</tr>
<tr>
<td></td>
<td>lsmod</td>
</tr>
</tbody>
</table>
3.2.2.4 Other Requirements

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

Table 10: Other Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Web Browser</td>
<td>Make sure that you have at least one of the following web browsers installed on the host where you run the installer GUI:</td>
</tr>
<tr>
<td></td>
<td>• Microsoft Internet Explorer 11 or higher</td>
</tr>
<tr>
<td></td>
<td>• Microsoft Edge</td>
</tr>
<tr>
<td></td>
<td>• Mozilla Firefox</td>
</tr>
<tr>
<td></td>
<td>• Google Chrome</td>
</tr>
<tr>
<td></td>
<td>Always use the latest version of these web browsers</td>
</tr>
<tr>
<td></td>
<td>You need a web browser to be able to run the SL Common GUI, and to display the Evaluation Form and send it to SAP</td>
</tr>
<tr>
<td>AIX: Additional Software</td>
<td>Make sure that the following additional file sets are installed:</td>
</tr>
<tr>
<td></td>
<td>• bos.adt − Base Application Development</td>
</tr>
<tr>
<td></td>
<td>• bos.perf − performance and diagnostics tools</td>
</tr>
<tr>
<td></td>
<td>• perfagent.tools − performance monitoring tools</td>
</tr>
<tr>
<td></td>
<td>• bos.perf.libperfstat − Performance Statistics Library</td>
</tr>
<tr>
<td>Host Name</td>
<td>To find out physical host names, open a command prompt and enter <code>hostname</code>.</td>
</tr>
<tr>
<td></td>
<td>For more information about the allowed host name length and characters allowed for SAP system instance hosts, see SAP Note 611361.</td>
</tr>
<tr>
<td></td>
<td>If you want to use virtual host names, see SAP Note 962955.</td>
</tr>
<tr>
<td></td>
<td>For HP-UX, see SAP Note 1503149.</td>
</tr>
<tr>
<td></td>
<td>For HP-UX, see SAP Note 1038842.</td>
</tr>
<tr>
<td>Login Shell</td>
<td>The installer only prompts you for this parameter if you use a login shell other than the recommended C shell (csh).</td>
</tr>
<tr>
<td></td>
<td>For more information, see SAP Note 202227.</td>
</tr>
<tr>
<td></td>
<td>For HP-UX, see SAP Note 1077887.</td>
</tr>
<tr>
<td></td>
<td>SAP Host Agent installation:</td>
</tr>
<tr>
<td></td>
<td>• Make sure that <code>/bin/false</code> can be used as a login shell.</td>
</tr>
<tr>
<td></td>
<td>• AIX only: Add <code>/bin/false</code> to the list of valid login shells (attribute shells) in <code>/etc/security/login.cfg</code>.</td>
</tr>
<tr>
<td>HP-UX: Mount and file system configuration</td>
<td>For recommendations about block size and mount option configuration, see SAP Note 1077887.</td>
</tr>
</tbody>
</table>
### Requirement Values and Activities

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared file systems for decentralized systems</td>
<td>If application servers are installed decentralized, then a “shared” file system must be installed, for example Network File System (NFS).</td>
</tr>
<tr>
<td><strong>AIX:</strong> C++ Runtime Environment</td>
<td>Minimal C++ runtime requirements for the specific SAP Kernel releases are listed in SAP Note 1780629.</td>
</tr>
<tr>
<td><strong>Linux:</strong> C compiler</td>
<td>Make sure that the C compiler gcc is installed.</td>
</tr>
</tbody>
</table>

### 3.3 Planning User and Access Management

You have to plan how you want to configure user and access management for your 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

**Note**

If you want to install the J2EE Adapter Engine as an optional standalone unit, you have to configure the User Management Engine (UME) for the ABAP UME of the SAP NetWeaver Process Integration (PI) system.

- Use an LDAP directory as the data source for user data.
  You cannot configure the AS Java to access an LDAP directory and an AS ABAP as the data source simultaneously. 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 79]

### More Information

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


---

[1]: http://help.sap.com/nw/
3.4 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, you perform the installation with default settings. This means that the installer prompts you only for a small selection of input parameters. These parameters include at least the following:
    - SAP System ID and Database Connectivity Parameters
    - SAP system profile directory – only for systems with instances on separate hosts
    - Master password
    - System Landscape Directory (SLD) destination
  - For more information about the 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.

**Recommendation**

If you want to configure the user management of your SAP system for an external ABAP system, as described in Preparing an External ABAP System as Source for User Data [page 144], we recommend that you select the Custom parameter mode. When you do this, you are prompted to select the appropriate option and to enter the required parameters.

If you do not choose the Custom parameter mode, you have to change the required parameters on the Parameter Summary screen.

**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 system 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 38]
SAP System Database Parameters [page 47]
3.4.1 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.

Table 11: General Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unicode System</td>
<td>A Java standalone system is always a Unicode system.</td>
</tr>
<tr>
<td>SAP System ID &lt;SAPSID&gt;</td>
<td>The SAP System ID &lt;SAPSID&gt; identifies the whole SAP system.</td>
</tr>
</tbody>
</table>

⚠️ 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 by equal to the <SAPSID> of an ABAP stack if they form a dual-stack system.

- Consists of exactly three alphanumeric characters
- Contains only uppercase letters
- Has a letter for the first character
- Does not include any of the reserved IDs listed in SAP Note [1979280](#).
- If you want to install a dialog 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>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP System Instance Numbers</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. If you do not enter a specific value, the instance number is set automatically to the next free and valid instance number that has not yet been assigned to the SAP system to be installed or to SAP systems that already exist on the installation host. To find out instance numbers of SAP systems that already exist on the installation host, look for subdirectories ending with <code>&lt;Instance_Number&gt;</code> of local (not mounted) <code>/usr/sap/&lt;SAPSID&gt;</code> directories. For more information about the naming of SAP system instances, see SAP Directories [page 56].</td>
</tr>
<tr>
<td>Caution</td>
<td><strong>AIX only:</strong> 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>Caution</td>
<td><strong>HP-UX only:</strong> 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>SAP System Profile Directory</td>
<td><code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/profile</code> or <code>/usr/sap/&lt;SAPSID&gt;/SYS/profile</code></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 <code>profile</code> directory when the installation option that you execute is not the first one belonging to your SAP system installation, for example if you are installing a distributed system or a dialog instance to an existing SAP system. See also the description of the parameters <code>SAP System ID</code> and <code>Database ID</code>.</td>
</tr>
<tr>
<td></td>
<td><code>/usr/sap/&lt;SAPSID&gt;/SYS/profile</code> is the soft link referring to <code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/profile</code>.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Master Password</td>
<td>Common password for all users created during the installation:</td>
</tr>
<tr>
<td></td>
<td><strong>Basic Password policy</strong></td>
</tr>
<tr>
<td></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></td>
<td><strong>Additional restrictions depending on SAP Adaptive Server Enterprise:</strong></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-z, A-Z, 0-9, &lt;space&gt;,</td>
</tr>
<tr>
<td></td>
<td>!#$%&amp;'() * +,-,:&lt;==&gt;?@[{}~</td>
</tr>
<tr>
<td></td>
<td>Depending on the installation option, additional restrictions may apply.</td>
</tr>
<tr>
<td></td>
<td><strong>Example</strong></td>
</tr>
<tr>
<td></td>
<td>The master password must not contain the name of a Java user created</td>
</tr>
<tr>
<td></td>
<td>during the installation).</td>
</tr>
<tr>
<td>Key Phrase for Secure Store</td>
<td>This is a random word or phrase that is used to encrypt the secure store.</td>
</tr>
<tr>
<td>Settings</td>
<td>The J2EE engine uses this phrase to generate the key that is used to</td>
</tr>
<tr>
<td></td>
<td>encrypt the data.</td>
</tr>
<tr>
<td></td>
<td>The uniqueness of the phrase you use contributes to the uniqueness of</td>
</tr>
<tr>
<td></td>
<td>the resulting key.</td>
</tr>
<tr>
<td></td>
<td><strong>Recommendation</strong></td>
</tr>
<tr>
<td></td>
<td>Use a long key phrase that cannot be guessed easily. Use both</td>
</tr>
<tr>
<td></td>
<td>uppercase and lowercase letters in the phrase and include special</td>
</tr>
<tr>
<td></td>
<td>characters.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>If you choose <em>Typical</em> mode, the installer sets the master password for</td>
</tr>
<tr>
<td></td>
<td>the key phrase. In this case, make sure that you replace the master</td>
</tr>
<tr>
<td></td>
<td>password with the required unique key phrase either on the</td>
</tr>
<tr>
<td></td>
<td>Parameter Summary screen or after the installation has finished.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>DNS Domain Name for SAP System</td>
<td>If you want to use HTTP-based URL frameworks such as Web Dynpro applications, you have to specify the DNS domain name for the SAP system. The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter <code>SAPLOCALHOSTFULL</code>. FQDN is the fully qualified domain name for an IP address. It consists of the host name and the domain name:&lt;br&gt;[&lt;Host_Name&gt;.&lt;Domain_Name&gt;]&lt;br&gt;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 <a href="https://support.sap.com">654982</a>.</td>
</tr>
</tbody>
</table>

**Example**

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

| Path to SAPCRYPTO.SAR | The SAP Cryptographic Library is required to enable Secure Sockets Layer (SSL) encryption of HTTP connections. In most cases it is installed automatically from the kernel medium. In case it is not installed automatically and you are prompted for it during the installation, you can download it as described in SAP Note [455033](https://support.sap.com). This software product is subject to export control regulations in Germany as the country of origin and import regulations of your own country. SAP may not yet have a corresponding export license for your user or company. Contact the contract department in your local SAP company. To download the SAP Cryptographic Software from the SAP Service Marketplace, you need a customer user ID. Before any transfer of these software products to persons, companies or other organizations outside your company, in particular in the case of any re-export of the software products, authorization is required from the German export control authorities. This might also be required from your responsible national export control authorities. This also applies to transfers to affiliated companies. Corresponding laws and regulations in the recipient country may also exist which restrict the import or the use of these software products. |

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.02 on UNIX: SAP Adaptive Server Enterprise

Planning

PUBLIC 41
### Table 12: Ports

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java Message Server Port</td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>The SCS instance profile contains the configuration for the Java message server.</td>
</tr>
<tr>
<td></td>
<td>The Java message server port uses the parameter <code>rdisp/msserv_internal</code> with default value <code>&lt;Instance_Number_Of_SCS_Message_Server_Instance&gt;</code>.</td>
</tr>
<tr>
<td></td>
<td>For more information about the parameters used for message server ports, see SAP Note 821875.</td>
</tr>
</tbody>
</table>

### Table 13: 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 <code>Custom</code> or by changing them on the parameter summary screen.</td>
</tr>
<tr>
<td></td>
<td>• If the operating system users already exist, the installer prompts you for the existing password, except if the password of these users is the same as the master password.</td>
</tr>
<tr>
<td></td>
<td>• Make sure that the user ID and group ID of these operating system users are unique and the same on each relevant application server instance host.</td>
</tr>
<tr>
<td></td>
<td>The <code>sapinst_instdir</code> directory belongs to a group named <code>sapinst</code>. If this group is not available, it is created automatically as a local group. For security reasons, we recommend removing the operating system users from the group <code>sapinst</code> after the execution of the installer has completed.</td>
</tr>
<tr>
<td></td>
<td>During the <strong>Define Parameters</strong> phase of the installer, you can specify that the operating system users are to be removed <strong>automatically</strong> from the group <code>sapinst</code> after the execution of the installer has completed.</td>
</tr>
<tr>
<td></td>
<td>For more information about the group <code>sapinst</code>, see Creating Operating System Users and Groups [page 52].</td>
</tr>
<tr>
<td></td>
<td>For more information about the <code>sapinst_instdir</code> directory, see Useful Information About the Installer [page 87].</td>
</tr>
</tbody>
</table>
Table 14: User Management Engine Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>UME Configuration</td>
<td>You are prompted for how to configure the UME during the input phase of the installation. You can choose between the following options:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Use Java database (default)</strong></td>
</tr>
<tr>
<td></td>
<td>○ If you choose this option, administrators can manage users and groups with the <strong>UME Web admin tool</strong> and <strong>SAP NetWeaver Administrator</strong> only.</td>
</tr>
<tr>
<td></td>
<td>○ For LDAP, use this configuration for the installation and change the configuration to LDAP after the installation (see [Configuring User Management to Use an LDAP Directory](page 106)).</td>
</tr>
<tr>
<td></td>
<td>• <strong>Use ABAP</strong></td>
</tr>
<tr>
<td></td>
<td>○ If you choose this option, administrators can manage users with the transaction SU01 on the external ABAP system, and, depending on the permissions of the communication user, also with the <strong>UME Web admin tool</strong> and <strong>SAP NetWeaver Administrator</strong>.</td>
</tr>
<tr>
<td></td>
<td>○ Make sure that you have created the required users manually on the external ABAP system before you choose this option (see [Preparing an External ABAP System as Source for User Data](page 144)).</td>
</tr>
</tbody>
</table>

**Recommendation**

Select the **Custom** parameter mode. When you do this, you are prompted to select the appropriate option and to enter the required parameters.

If you do **not** choose the **Custom** parameter mode, you have to change the required parameters on the **Parameter Summary** screen.

**Note**

If you want to install the **J2EE Adapter Engine** as an optional standalone unit, we recommend that you configure the User Management Engine (UME) for the ABAP UME of the SAP NetWeaver Process Integration (PI) system.

For more information about supported UME data sources and change options, see SAP Note 718383.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java Administrator User and Password</td>
<td>The installer sets the user name <strong>Administrator</strong> and the master password by default. This user has administrative permissions for user management.</td>
</tr>
<tr>
<td>Java Guest User and Password</td>
<td>The installer sets the user name <strong>Guest</strong> and the master password by default. This user is used for anonymous access.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server Number</td>
<td>This is the instance number on the application server of the central ABAP system to which you want to connect the Application Server Java. To find out the number on the host of the central instance, look under the SAP directory <code>usr/sap/&lt;SAPSID&gt;/DVEBMS&lt;Instance_Number&gt;</code>. The value <code>&lt;Instance_Number&gt;</code> is the number assigned to the SAP system.</td>
</tr>
<tr>
<td>Application Server Host</td>
<td>This is the host name of the relevant application server instance. To find out the host name, enter <code>hostname</code> at the command prompt of the host running the central instance.</td>
</tr>
<tr>
<td>Communication User and Password</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>SDM Password</td>
<td>This user is used for the Software Deployment Manager (SDM). The installer sets the master password by default.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator User and Password</td>
<td>This is the name and password of the administrator user that you must have created on the external ABAP system. This user has administrative permissions for user management.</td>
</tr>
<tr>
<td>Administrator Role</td>
<td>The role <code>SAP_J2EE_ADMIN</code> must exist on the external ABAP system.</td>
</tr>
</tbody>
</table>
### Parameter Definition

**Guest User and Password**
This is the name and password of the guest user that you must have created on the external ABAP system. This user is used for anonymous access.

**Guest Role**
The role `SAP_J2EE_GUEST` must exist on the external ABAP system.

**Communication User and Password**
This is the name and password of the existing ABAP communication user. You must have created this user manually on the external ABAP system.

**SDM Password**
This user is used for the Software Deployment Manager (SDM).
The installer sets the master password by default.

### Table 15: System Landscape Directory

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SLD Destination</strong></td>
<td>The System Landscape Directory (SLD) is designed for registering the systems (along with the installed software) of your whole system landscape. The usual case is to configure one SLD for your complete system landscape. You can choose between the following options:</td>
</tr>
<tr>
<td></td>
<td><strong>Register in existing central SLD</strong>&lt;br&gt;Choose this option to register the SAP system you are installing in an existing SAP System Landscape Directory (SLD) by specifying the SLD connection parameters listed below in this table.</td>
</tr>
<tr>
<td></td>
<td><strong>No SLD destination</strong>&lt;br&gt;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.</td>
</tr>
<tr>
<td></td>
<td><strong>Configure a local SLD</strong>&lt;br&gt;Choose this option if you want to have a local SLD on the SAP Java system that you are installing. Then the SAP system you are installing is the SLD server.</td>
</tr>
</tbody>
</table>

**Register in existing central SLD**

<p>| SLD HTTP Host      | The host name of the existing central SLD. |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLD HTTP Port</td>
<td>HTTP port of the SAP system based on AS Java on which the System Landscape Directory (SLD) resides. The following naming convention applies: 5&lt;Central_Instance_Number&gt;00.</td>
</tr>
<tr>
<td>Example</td>
<td>If the central instance number of the AS Java on which the System Landscape Directory (SLD) resides is 01, the SLD HTTP Port is 50100.</td>
</tr>
<tr>
<td>SLD Data Supplier User and password</td>
<td>The existing SLD Data Supplier user and password of the existing central SLD</td>
</tr>
<tr>
<td>SLD ABAP API User and password</td>
<td>The existing SLD ABAP API user and password of the existing central SLD</td>
</tr>
<tr>
<td>Configure a local SLD</td>
<td></td>
</tr>
<tr>
<td>SLD Data Supplier User and password</td>
<td>Specify the name of the SLD Data Supplier user to be created. This user is used to send the self-registration data of your system to the SLD.</td>
</tr>
<tr>
<td>Recommendation</td>
<td>We recommend that you name this user SLDDSUSER.</td>
</tr>
<tr>
<td>Object Server Name</td>
<td>The Object Server Name together with the CIM namespace identifies the absolute location of your System Landscape Directory. If you do not have a prefix reserved on SAP Market Place for Object Server Name, or if you just want to install a test or development system, enter the central instance host of your system. For more information about the Object Server Name parameter, see SAP Note 935245.</td>
</tr>
</tbody>
</table>

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.02 on UNIX: SAP Adaptive Server Enterprise

PUBLIC

Planning
### 3.4.2 SAP System Database Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database ID <code>&lt;DBSID&gt;</code></td>
<td>The <code>&lt;DBSID&gt;</code> identifies the database instance. The installer prompts you for the <code>&lt;DBSID&gt;</code> when you are installing the database instance. The <code>&lt;DBSID&gt;</code> can be the same as the <code>&lt;SAPSID&gt;</code></td>
</tr>
</tbody>
</table>

**Caution**

Choose your database ID carefully. Renaming is difficult and requires that you reinstall the SAP system.

- If you want to install a new database, make sure that your database ID:
  - Is unique throughout your organization
  - Consists of exactly three alphanumeric characters
  - Contains only uppercase letters
  - Has a letter for the first character
  - Does not include any of the reserved IDs listed in SAP Note 1979280.

| Java Database User (SAPSR3DB) | The user name corresponds to the owner of the database tables. |
| Database user for database system administration (sapsa) | This is the default user for database monitoring and administration. |
| Database user for database system security tasks (sapsso) | This is the default user for security relevant tasks such as user creation and password setup. |

### 3.5 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 in `/usr/sap/trans`.
- Use a transport directory located on a host other than the global host (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 76].

More Information

- Required File Systems and Directories [page 56]
- See the SAP Library:

3.6 Planning the Switchover Cluster for High Availability

You can reduce unplanned downtime for your high-availability (HA) SAP system by setting up a switchover cluster. This setup replicates 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 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.

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 dialog instances. This complements the switchover solution and is an essential part of building HA into your SAP system.

Recommendation

We recommend switchover clusters to ensure HA for 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 must choose a proprietary switchover product that works with your operating system.

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

- Check the information and the installation guides available at: https://wiki.scn.sap.com/wiki/display/SI/SAP+High+Availability
- The enqueue replication server (ERS) is essential for a high-availability system. You need one ERS for the SCS installed in your system.

Features

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

![Switchover Setup Diagram](image)

**Note**

This figure and the figures in this section are only examples. Only the instances relevant to the switchover are shown – for example, the primary application server instance is not shown.
These graphics summarize the overall setup and do not show the exact constellation for an installation based on one of the available technologies (ABAP, dual-stack, or Java).

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

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

**Constraints**

This documentation concentrates on the switchover solution for the central services instance. For more information about how to protect the NFS file system 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 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:

- Central, distributed, or high-availability system
- Dialog instance

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

Central, Distributed, or High-Availability System

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

You can install optional standalone units J2EE Adapter Engine, Partner Connectivity Kit, Application Sharing Server only as a central system.

1. You check that the required operating system users and groups [page 52] are created.
2. You set up the required file systems [page 56] and make sure that the required disk space is available for the directories to be created during the installation.
3. If required, you set up virtual host names [page 65].
4. If you want to install a high-availability system, you perform switchover preparations [page 65].
5. If you want to share the transport directory trans from another system, you export [page 76] this directory to your installation hosts.
6. You check that the required installation media [page 66] are available on each host.
7. Continue with Installation [page 72].

The following preparation is optional: Preparing an External ABAP System as Source for User Data [page 144]

Dialog Instance

You have to perform the following preparations on the host where you install the dialog instance:

1. You check that the required operating system users and groups [page 52] are created.
2. You set up file systems [page 56] and make sure that the required disk space is available for the directories to be created during the installation.
3. If required, you set up virtual host names [page 65].

4. If you want to share the transport directory trans from another system, you export [page 76] this directory to your installation hosts.

5. You check that the required installation media [page 66] are available on the dialog instance host.

6. If you upgraded the SAP system to which you want to install a new dialog instance, you might have to update instance profiles of the existing system [page 153].

7. Continue with Installation [page 72].

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 systems users, groups, and services automatically, you can optionally create them before the installation. This might be the case if you use central user management such as Network Information System (NIS).

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

⚠️ Caution

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

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

The installer checks whether 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 <Product> Software Life-Cycle Options Additional Preparation Options Operating System Users and Groups.

For more information, see Running the Installer [page 83].
You create operating system users and groups manually. Check the settings for these operating system users.

**User Settings**

- **Oracle Solaris**: If your operating system is Oracle Solaris 10 or higher, follow the parameter recommendations for SAP applications in SAP Note 724713.
- **AIX**: Make sure that you have set the limits for operating system users as described in SAP Note 323816.
- **HP-UX, Linux, Oracle Solaris**: Make sure that you have set the limits for operating system users root, `<sapsid>adm`, and your database-specific operating system users (see also section “Creating Operating System Users and Groups” and “Running the Installer” in the installation guide).

**Caution**

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

○ Using *csh* shell, the output of command `limit` needs to be at least as follows:

**Example**

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

<table>
<thead>
<tr>
<th>Output</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>cputime</td>
<td>unlimited</td>
</tr>
<tr>
<td>filesize</td>
<td>unlimited</td>
</tr>
<tr>
<td>datasize</td>
<td>unlimited</td>
</tr>
<tr>
<td>stacksize</td>
<td>8192 KB</td>
</tr>
<tr>
<td>coredumpsize</td>
<td>unlimited</td>
</tr>
<tr>
<td>descriptors</td>
<td>8192</td>
</tr>
<tr>
<td>memoryuse</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 18:

<table>
<thead>
<tr>
<th>Properties</th>
<th>Output sh</th>
<th>Output ksh</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. You make any change to the environment – such as variables, or paths – at your own responsibility.
- Do not delete any shell initialization scripts in the home directory of the OS 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.
  - 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.
  - If you use local operating system user accounts instead of central user management (for example, NIS), user <sapsid>adm, sapadm, and the database operating system user must have the same password on all hosts.
  - If you use local operating system user accounts, make sure that you install your SAP system in Custom mode and specify suitable IDs for user <sapsid>adm and group sapsys on all hosts. The IDs have to be the same on all hosts. If you choose Typical mode, you are not asked to specify the user and group IDs.
- If operating system users already exist, make sure that they are assigned to group sapinst.
- If you create operating system users manually or use already existing operating system users, make sure that the home directory for each of these users is not the root directory (/).
- Make sure that the home directory of user <sapsid>adm is not critical for recursive changes on permissions:
  - When operating system users are created by the installer, the permissions on the home directories of these users are changed recursively. This can cause unpredictable errors if you define a critical home directory.
  - For example, the home directory must not be / or /usr/sap.
- 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.
Operating System Users and Groups

The installer chooses available operating system user IDs and group IDs unless you are installing a dialog instance. On a dialog instance host you have to enter the same IDs as on the host of the central instance.

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

**Recommendation**

For security reasons, we recommend that you remove the operating system users from the group sapinst after the installer has completed. For more information, see Ensuring User Security [page 107].

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 38].

### Table 19: Users and Groups

<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>SAP system administrator &lt;sapsid&gt;adm</td>
<td>sapsys (sapinst as secondary group)</td>
</tr>
<tr>
<td>syb&lt;dbsid&gt;</td>
<td>sapsys (sapinst as secondary group)</td>
</tr>
</tbody>
</table>

**Note**

Only used on the database host.

SAP Host Agent:
Table 20: User and Groups of the SAP Host Agent

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

**Note**

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

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

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

Table 21: 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 directories that are required for the instances of an SAP system, how to set up file systems and – if required – raw devices on operating system level:

- SAP Directories [page 56]
- Setting Up File Systems for High-Availability [page 61]

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 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 (\/).

You are prompted only for the \(<\texttt{sapmnt}\rangle\) directory during the installation.

The following types of directories are created automatically:

- Physically shared directories
- Logically shared directories
- Local directories

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

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

![Figure 11: Directory Structure for a Java System (Unicode)](image)

A Java standalone system is always a Unicode system.
Physically Shared Directories

Physically shared directories reside on the SAP 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. The first installation host is usually the host where 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 an HA system or a system with dialog instance – 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 77]):
  - `global`
    Contains globally shared data
  - `profile`
    Contains the profiles of all instances
  - `exe`
    Contains executable kernel programs
- The directory `/<sapmnt>/trans`, which is the global transport directory.
  If you want to use an existing transport directory, you have to mount it before you install the application server instance in question. Otherwise, the installer creates `/usr/sap/trans` locally.
  For more information, see Exporting and Mounting the Global Transport Directory [page 76].

Table 22: Physically Shared SAP Directories

<table>
<thead>
<tr>
<th>Directory</th>
<th>Description</th>
<th>Required Minimum Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;sapmnt&gt;/&lt;SAPSID&gt;</code></td>
<td>SAP system directory</td>
<td>Minimum 2 GB</td>
</tr>
<tr>
<td><code>/usr/sap/trans</code></td>
<td>SAP transport directory</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

Logically shared directories reside on the local hosts with symbolic links to the physically shared directories that reside on the SAP global host. The installer creates the directory `/usr/sap/<SAPSID>/SYS` on each host. The subdirectories contain symbolic links to the corresponding subdirectories of `/<sapmnt>/<SAPSID>` on the first installation host, as shown in the figure above.
The installer uses sapcpe to replicate the kernel automatically from /usr/sap/<SAPSID>/SYS/exe/run
(DIR_CT_RUN) to /usr/sap/<SAPSID>/<Instance_Name>/exe (DIR_EXECUTABLE parameter in START
profile) for each SAP system instance, where <Instance_Name> is either JC<Instance_Number> (central
instance) or J<Instance_Number> (dialog instance).

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 following entry in the start profile is responsible for this:

Execute_00 = immediate $(DIR_CT_RUN)/sapcpe$(FT_EXE) pf=$(_PF)

where $(_PF) points to the instance profile.

Caution

Do not delete DIR_CT_RUN from the instance profile. Otherwise, you cannot restart the system after
patches have been applied.

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 the central instance is called JC<Instance_Number>.
    The SDM subfolder contains the Software Deployment Manager (SDM). The SDM is only available on
    the central instance. It is a tool with which you can manage and deploy software packages (Software
    Deployment Archives and Software Component Archives) that you receive from SAP.
  - The directory of a dialog instance is called J<Instance_Number>.
  - The directory of the central services instance (SCS instance) is called SCS<Instance_Number>.
    For a high-availability system, you must install an ERS instance for the SCS instance.
  - The directory of an enqueue replication server instance (ERS instance) is called ERS<Instance_Number>
    (high availability only).
<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;/JC&lt;Instance_Number&gt;</code></td>
<td>Central instance directory</td>
<td>4 GB for the AS Java for the AS Java + up to 2 GB for each additional usage type or software unit you want to install</td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/J&lt;Instance_Number&gt;</code></td>
<td>Dialog instance directory</td>
<td>4 GB for the AS Java + up to 2 GB for each additional usage type or software unit you want to install</td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/SCS&lt;Instance_Number&gt;</code></td>
<td>Central services instance (SCS instance) directory</td>
<td>2 GB</td>
</tr>
<tr>
<td><code>/usr/sap/&lt;SAPSID&gt;/ERS&lt;Instance_Number&gt;</code></td>
<td>Enqueue replication server instance (ERS) directory for the SCS (high availability only)</td>
<td>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:

Figure 12: Directory Structure for the SAP Host Agent

Local Directories (SAP Host Agent)

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

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

### 4.3.2 Setting Up File Systems for a High-Availability System

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

Prerequisites

You have already installed the hardware – that is, hosts, disks, and network – and decided how to distribute the database, SAP instances, and – if required – Network File System (NFS) server over the cluster nodes (that is, over the host machines). For more information, see Planning the Switchover Cluster for High Availability [page 48].

Context

From the perspective of an SAP application, there are the following types of SAP Directories [page 56]:

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

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

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 must be part of the switchover cluster.

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

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

   Caution

   To start or stop an SAP instance, you have to do one of the following:
   - Make the physically shared SAP directories under /<sapmnt>/<SAPSID> available to the server beforehand.
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 56]):

- SYS – which contains links to the central directory /<sapmnt>/<SAPSID>
- <Instance_Type><Instance_Number> – where the name is defined by the type of services and the application server number:
  - JC<Instance_Number> – which contains data for the central instance
  - J<Instance_Number> – which contains data for a dialog instance
  - SCS<Instance_Number> – which contains data for the Java central services instance

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

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

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

Note

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

3. You assign the local (non-switching) file systems to permanent mount points.

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

Example

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

Note that this is only an example. For more information on a setup that meets your needs, consult your HA partner.
Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.02 on UNIX: SAP Adaptive Server Enterprise

Preparation

Figure 13: File Systems and Disks in an HA Setup
4.4 Using Virtual Host Names

You can use one or more virtual TCP/IP host names for SAP servers within an SAP server landscape to hide their physical network identities from each other. This can be useful when quickly moving SAP servers or complete server landscapes to alternative hardware without having to reinstall or reconfigure.

Prerequisites

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

Procedure

Proceed as described in SAP Note 962955

4.5 Performing Switchover Preparations for High Availability

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

For more information, see SAP System Parameters [page 38].

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 the Installation Media

This section describes how to prepare the installation media.

Installation media are available as follows:

- The Software Provisioning Manager 1.0 archive containing the installer. You always have to download the latest version of the Software Provisioning Manager 1.0 archive.
- The media containing the software to be installed, which are available as follows:
  - You normally obtain the physical installation media as part of the installation package.
  - You can also download the installation media apart from the Software Provisioning Manager 1.0 archive from https://launchpad.support.sap.com/#/softwarecenter, as described at the end of this section.

Note

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.

Related Information

- Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 66]
- Using the Physical Media from the Installation Package [page 68]
- Downloading Installation Media [page 70]

4.6.1 Downloading and Extracting the Software Provisioning Manager 1.0 Archive

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

Context

You require the SAPCAR tool to be able to unpack and verify software component archives (*.SAR files). *.SAR is the format of software lifecycle media and tools that you can download from the SAP Software Download Center. For more information about how to get this tool, see the Procedure section below.
**Procedure**

1. Download the latest version of the Software Provisioning Manager 1.0 archive
   70SWPM10SP<Support_Package_Number>_<Version_Number>.SAR from:
   [https://support.sap.com/sitoolset](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.

   ![Note]
   An older SAPCAR version might extract archive files in a wrong way and this could prevent the installer from working consistently.

   Proceed as follows to get the latest version of SAPCAR:

   a. Go to [https://launchpad.support.sap.com/#/softwarecenter](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](https://launchpad.support.sap.com/#/softwarecenter).

3. Using the latest version of SAPCAR, you can verify the signature of the downloaded 70SWPM10SP<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](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](https://tcs.mysap.com/crl/crlbag.p7s) and move it to the same directory.

   b. Verify the signature of the downloaded 70SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive by executing the following command:

   ![Note]
   Check SAP Notes [2178665](https://launchpad.support.sap.com/#/softwarecenter) and [1680045](https://launchpad.support.sap.com/#/softwarecenter) whether additional information is available.

   ```
   /<Path to SAPCAR>/sapcar -tvVf `<Path to Download Directory>`/70SWPM10SP<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:

   ```
   sapcar -tvf `<Path to Download Directory>`/70SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -crl `<file name of revocation list>`
   ```

   ```
   ```
### 4.6.2 Using the Physical Media from the Installation Package

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

**Context**

The signature of media is checked **automatically** by the installer during the Define Parameters phase while the Media Browser screens are processed (see also Running the Installer [page 83]). The installer only accepts media whose signature has been checked. For more information, see SAP Note 2393060.

**Procedure**

1. Identify the required media for your installation as listed below.

   The following table shows the required media for the installation of an SAP system based on SAP NetWeaver application server Java:

   Note

   For a central system, where all mandatory instances reside on one host, you need the installation media that are required for the central instance, central services instance, and database instance.

   Note

   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).
### Table 24: SAP Instance Installation Required Media

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central instance</td>
<td>✦ Software Provisioning Manager 1.0 archive</td>
</tr>
<tr>
<td></td>
<td>✦ UC Kernel (folder K_&lt;Version&gt;<em>U</em>&lt;OS&gt;) where U means Unicode.</td>
</tr>
<tr>
<td></td>
<td>✦ Java Components</td>
</tr>
<tr>
<td>Database instance</td>
<td>✦ Software Provisioning Manager 1.0 archive</td>
</tr>
<tr>
<td></td>
<td>✦ UC or NUC Kernel (folder K_&lt;Version&gt;<em>N or U</em>&lt;OS&gt;) where U means Unicode and N means non-Unicode.</td>
</tr>
<tr>
<td></td>
<td>✦ Java Components</td>
</tr>
<tr>
<td></td>
<td>✦ RDBMS</td>
</tr>
<tr>
<td>Dialog instance</td>
<td>✦ Software Provisioning Manager 1.0 archive</td>
</tr>
<tr>
<td></td>
<td>✦ UC Kernel (folder K_&lt;Version&gt;<em>U</em>&lt;OS&gt;) where U means Unicode.</td>
</tr>
<tr>
<td></td>
<td>✦ Java Components</td>
</tr>
</tbody>
</table>

**Note**

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

2. **Make the installation media available on each installation host as follows:**

   a. Download and unpack the latest version of Software Provisioning Manager as described in *Downloading and Extracting the Software Provisioning Manager 1.0 Archive* [page 66].

   b. Make the installation media containing the software to be installed available.

   You can do this in one of the following ways:

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

   **Note**

   Depending on your installation type, one or more instances can reside on the same host. You need to keep this in mind when you make the required installation media available on each installation host.

   For a central system, you need to make all required installation media available on the single installation host.

   **Caution**

   - Mount the media locally. We do not recommend you to use Network File System (NFS), because reading from media mounted with NFS might fail.
   - 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 and commas.
   - If you perform a local installation and there is only one media drive available on your installation host, you must copy at least the Installation Master medium to the local file system.
4.6.3 Downloading Installation Media

This section describes how you download installation 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 66].
2. Create a download directory on the host on which you want to run the installer.
3. Identify all download objects that belong to one installation medium according to the following criteria:

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

   - Download path or location:
     You can download installation media from the SAP Software Download Center using one of the following paths:
     - To download the kernel media, go to [support.sap.com/sitoolset][1] > System Provisioning > Software Provisioning Manager 1.0 SP<Current Version> > Download Kernel releases delivered for SL Toolset > SL TOOLSET 1.0 (INSTALLATIONS AND UPGRADES) > KERNEL FOR INSTALLATION/SWPM.
     - To download all media required for your SAP product, you can use one of the following navigation paths:

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

4. Download the objects to the download directory.
5. To correctly recombine 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 were you unpack the Software Provisioning Manager archive.

**Related Information**

Downloading Installation Media [page 70]
5 Installation

5.1 Installation Checklist

This section includes the installation steps for the following:

- Central system
- Distributed system
- High-availability system
- Dialog 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.

### Central System

1. You **check the prerequisites** [page 80] and **run the installer** [page 83] on the central system host with option **Central System** to install the SAP system.

2. You continue with **Post-Installation** [page 95].

### Distributed System

1. If you want to share the transport directory `trans` from another system, you have to **mount** [page 76] it from this system. Otherwise, we recommend that you share the `trans` directory that is created during the installation of the central instance (`/usr/sap/trans`).

2. On the **SCS instance host**, proceed as follows:
   1. You **check the prerequisites** [page 80] and **run the installer** [page 83] to install the central services instance (SCS instance).
   2. You **export the global directories** [page 77] to the database instance host, to the central instance host, and – if required – to the hosts where you want to install one or more dialog instances.

3. On the **database instance host**, proceed as follows:
   1. You **mount the exported global directories** [page 77] from the SAP global host (`<sapmnt>/<SAPSID>/exe`, `<sapmnt>/<SAPSID>/profile`, `<sapmnt>/<SAPSID>/global`) and SAP transport host (`/usr/sap/trans`).
   2. You **check the prerequisites** [page 80] and **run the installer** [page 83] to install the database instance.
4. On the **central instance host**, proceed as follows:

   **i Note**
   
   You can use the SAP transport host or the SAP global host as your central instance host.

1. You mount the exported global directories [page 77] from the SAP global host (<sapmnt>/<SAPSID>/exe, <sapmnt>/<SAPSID>/profile, <sapmnt>/<SAPSID>/global) and SAP transport host (/usr/sap/trans).
2. You check the prerequisites [page 80] and run the installer [page 83] to install the central instance.
5. If required, you install one or more dialog instances on the chosen hosts as described in subsection **Dialog Instance** of this section.
   1. You mount the exported global directories [page 77] from the SAP global host (<sapmnt>/<SAPSID>/exe, <sapmnt>/<SAPSID>/profile, <sapmnt>/<SAPSID>/global) and SAP transport host (/usr/sap/trans).
   2. You check the prerequisites [page 80] and run the installer [page 83] to install the dialog instance.
6. You continue with **Post-Installation** [page 95].

**Graphical Overview**

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

![Graphical Overview](image)

**High-Availability System**

This section describes how you install a high-availability (HA) system consisting of two nodes (host A and host B). For more information, consult your HA partner.
This procedure describes the steps that are required for a hardware cluster consisting of two nodes (host A and host B):

1. If you want to share the transport directory `trans` from another system, you have to mount [page 76] it from this system. Otherwise, we recommend that you share the `trans` directory that is created during the installation of the central instance (see below).

2. You set up the **switchover cluster infrastructure** as follows:
   1. You check the prerequisites [page 80] and run the installer [page 83] to install the central services instance (SCS instance) using the virtual host name [page 65] on the primary cluster node, **host A**.
   2. You export global directories [page 77] in `<sapmnt>/<SAPSID>` to the database host and to the central instance host.
   3. You prepare the standby cluster node, **host B**, and make sure that it has all the necessary file systems [page 61], mount points, and (if required) Network File System (NFS).
   4. You set up the user environment on the standby node, host B as follows:
      1. You use the same user and group IDs as on the primary node.
      2. 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 52].
   5. You configure the switchover software and test that switchover functions correctly to all standby nodes in the cluster.
   6. You repeat the following steps until you have finished installing the enqueue replication server (ERS instance) on all nodes in the cluster:
      1. You perform the switchover to a node where you want to install the enqueue replication server instance (ERS instance) for the central services instance (SCS instance).

3. On the **database instance host**, proceed as follows:

   - **Note**

   In a high-availability installation, the central 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 prepare the database instance host and make sure that it has all the necessary file systems [page 61], mount points, and (if required) Network File System (NFS).
   2. You check the prerequisites [page 80] and run the installer [page 83] to install the database instance.

4. On the **central instance host**, proceed as follows:

   1. You prepare the central instance host and make sure that it has all the necessary file systems [page 61], mount points, and (if required) Network File System (NFS).
   2. You check the prerequisites [page 80] and run the installer [page 83] to install the central instance.
   3. If you want to use the shared transport directory `trans` from another system, you also mount [page 76] this directory (see above).

5. We recommend that you install dialog instances with the installer to create redundancy. The application server instances are not a SPOF. Therefore, do **not** include these instances in the cluster.
1. You mount the global directories [page 77] in `<sapmnt>/<SAPSID>`.
2. You check the prerequisites [page 80] and run the installer [page 83] to install the dialog instance.
3. If you want to use the shared transport directory `trans` from another system, you also mount [page 76] this directory (see above).
4. You continue with Post-Installation [page 95].

### Graphical Overview

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

![Distribution of Instances in a High-Availability Java System](image)

**Figure 15: Distribution of Instances in a High-Availability Java System**

**Dialog Instance**

You perform the following steps on the host where you install the dialog instance.

1. You make sure that the global directories of the SAP system for which you want to install the dialog instance are mounted [page 77] on the host where you want to install the dialog instance.
2. You check the prerequisites [page 80] and run the installer [page 83] to install the dialog instance.
3. You continue with Post-Installation [page 95].
5.2 Exporting and Mounting the Transport Directory

Make sure that the transport directory exists, that it is exported on the transport directory host, and that it is mounted on each SAP instance installation host.

Context

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

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

For more information, see http://help.sap.com/nw70/SAP NetWeaver 7.0 <including Enhancement_Package> Application Help Function-Oriented View: English Solution Life Cycle Management by Key Capability Software Life-Cycle Management Software Logistics Change and Transport System Change and Transport System - Overview (BC-CTS) Basics of the Change and Transport System Transport Management System - Concept

- If this 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 this transport directory does not exist, proceed as follows:
  ○ Create the transport directory (either on the central instance host 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

Note

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

1. Create the mount point /usr/sap/trans.
5.3 Exporting and Mounting Global Directories

If you install an SAP system distributed over several hosts, you have to nominate one host as the SAP global host. This is the host on which the global directories are to reside. You have to make sure that the global directories are also available on the hosts on which you intend to install the remaining instances of the SAP system. You do this by exporting the global directories on the SAP global host and mounting them on the installation hosts of the remaining SAP system instances to be installed.

Example

You install an Application Sharing Server or a J2EE Adapter Engine or an SAP Partner Connectivity Kit distributed over several hosts. You decide that the host with the main instances (Java central services instance (SCS instance), central instance, database instance) is the SAP global host. Before you install dialog 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

  With a homogeneous installation, all SAP system instances are installed on hosts with the same UNIX operating system.

  Proceed as follows:

  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 on which you want to install the new instance:

  ```
  <sapmnt>/<SAPSID>/exe
  <sapmnt>/<SAPSID>/profile
  ```
b. Log on to the host of the new instance as user root.

c. Create the following mount points and mount them from the SAP global host:

\[
\text{<sapmnt>}/<\text{SAPSID}>/\text{exe}
\]

\[
\text{<sapmnt>}/<\text{SAPSID}>/\text{profile}
\]

\[
\text{<sapmnt>}/<\text{SAPSID}>/\text{global}
\]

**Caution**

Make sure that these mount points are permanent. Otherwise, automatic start of the instance services does not work when you reboot the system.

---

**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 172].

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:

\[
\text{<sapmnt>}/<\text{SAPSID}>/\text{profile}
\]

\[
\text{<sapmnt>}/<\text{SAPSID}>/\text{global}
\]

**Caution**

**Do not** export \(<\text{sapmnt}>/<\text{SAPSID}>/\text{exe}\).

b. Log on to the host of the new instance as user root.

c. Create the following mount points and mount them from the SAP global host:

\[
\text{<sapmnt>}/<\text{SAPSID}>/\text{profile}
\]

\[
\text{<sapmnt>}/<\text{SAPSID}>/\text{global}
\]

**Caution**

Make sure that these mount points are permanent. Otherwise automatic start of the instance services does not work when you reboot the system.

**Caution**

**Do not** mount \(<\text{sapmnt}>/<\text{SAPSID}>/\text{exe}\) and do not create it locally. It is created automatically during the installation.
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 36].

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 38]).

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 106].

Using an External SAP ABAP System as Source for User Data

1. You prepare the external SAP ABAP system as described in Preparing an External ABAP System as Source for User Data [page 144].
2. You install your SAP system as described in this installation guide. During the installation, you specify an external ABAP system as data source for the User Management Engine (UME) (see SAP System Parameters [page 38]).
3. After the installation has finished, you can no longer change this configuration of the UME. For more information, see Configuring User Management [page 106].
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 106].

5.5 Prerequisites for Running the Installer

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

- For the SL Common GUI, make sure that the following web browser requirements are met:
  - You have one of the following supported browsers on the device where you want to run the SL Common GUI: Google Chrome, Mozilla Firefox, Microsoft Edge, or Microsoft Internet Explorer 11. Always use the latest version of these web browsers.

  Recommendation
  We recommend using Google Chrome.

  - If you copy the SL Common GUI URL manually in the browser window, make sure that you open a new Web browser window in private browsing mode (Internet Explorer), incognito mode (Chrome) or private browsing mode (Firefox). This is to prevent Web browser plugins and settings from interfering with the SL Common GUI.

  For more information about the SL Common GUI, see Useful Information About the Installer [page 87].

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

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

- Make sure that you have specified the most important SAP system parameters as described in Basic SAP System Installation Parameters [page 37] before you start the installation.

- Check that your installation hosts meet the requirements for the installation options that you want to install. For more information, see Running the Prerequisite Checker [page 24].

- If you want to install a dialog instance into an existing system, make sure that you have exported and mounted global directories [page 77].

- Check the value of the environment variable `TEMP`, `TMP`, or `TMPDIR`:

  Table 26:

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

- 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 variable `TEMP`, `TMP`, or `TMPDIR` points – for example, by using a crontab entry.
- Make sure that you have at least 60 MB of free space in the installer directory for each installer option. In addition, you need 200 MB free space for the installer executables. If you cannot provide 200 MB free space in the temporary directory, you can set one of the environment variables `TEMP`, `TMP`, or `TMPDIR` to another directory with 200 MB free space for the installer executables.
- Make sure that the temporary directory has the permissions 777.

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

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

- **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 27:

<table>
<thead>
<tr>
<th>Output</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>cputime</td>
<td>unlimited</td>
</tr>
<tr>
<td>filesize</td>
<td>unlimited</td>
</tr>
<tr>
<td>datasize</td>
<td>unlimited</td>
</tr>
<tr>
<td>stacksize</td>
<td>8192 KB</td>
</tr>
<tr>
<td>coredumpsize</td>
<td>unlimited</td>
</tr>
</tbody>
</table>
○ Using `sh` or `ksh` shell, the output of command `ulimit -a` needs to be at least as follows:

![Example](image)

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>descriptors</td>
<td>8192</td>
</tr>
<tr>
<td>memoryuse</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

Table 28:

<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>

● If you want to install a dialog instance to 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. Make sure that you 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](image)

Rename `/usr/sap/S14/SYS/profile/S14_JC20_zsi-aix693p2_D20081204`

● Make sure that the following ports are not used by other processes:
  ○ Port 4237 is used by default as HTTPS port for communication between the installer and the SL Common GUI.
  If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:
  ```
  SAPINST_HTTPS_PORT=<Free Port Number>
  ```
  ○ Port 4239 is used by default for displaying the feedback evaluation form at the end of the installer processing.
  The filled-out evaluation form is then sent to SAP using HTTPS.
If this port cannot be used, you can assign a free port number by executing `sapinst` with the following command line parameter:

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

## 5.6 Running the Installer

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

### Prerequisites

For more information, see Prerequisites for Running the Installer [page 80].

### Context

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

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

For more information about the SL Common GUI, see Useful Information About the Installer [page 87].

### Procedure

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

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

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

2. Make the installation media available.

   For more information, see Preparing the Installation Media [page 66].
Recommendation

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

Note

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

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

```
/<Path_To_Unpack_Directory>/sapinst
```

Note

If you want to use a virtual host name, start the installer with the installer property `SAPINST_USE_HOSTNAME` as follows:

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

For more information, see Using Virtual Host Names [page 65].

Caution

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

4. The installer is starting up.

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

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

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

If you have a supported web browser (see Prerequisites for Running the Installer [page 80]) installed on the host where you run the installer, you can open this URL directly in the shell. Otherwise open the URL in a supported web browser that runs on another device.

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

Note

Before you reach the Welcome screen, your browser might warn you that the certificate of the sapinst process on this computer could not be verified. Accept this warning to inform your browser that it can trust this site, even if the certificate could not be verified.
5. On the Welcome screen, choose the required option:
   ○ Install an SAP system
     Install an SAP system or an optional standalone unit:
     ○ To install an SAP system based on SAP NetWeaver Application Server for Java, choose
       ✂️ <Product> ➔ SAP Application Server Java ➔ <Database> ➔ <System Variant> ➔
     ○ To install an optional standalone unit – that is an Application Sharing Server, J2EE Adapter Engine, or an SAP Partner Connectivity Kit – choose one of the following:
       ○ Application Sharing Server
         ✂️ SAP NetWeaver 7.0 <Support Release or Enhancement Package> ➔ Optional
            Standalone Units ➔ Application Sharing Server ➔ <Database> ➔ Application Sharing Server Installation
         ○ J2EE Adapter Engine
           ✂️ SAP NetWeaver 7.0 <Support Release or Enhancement Package> ➔ Optional
              Standalone Units ➔ J2EE Adapter Engine ➔ <Database> ➔ J2EE Adapter Engine Installation
         ○ SAP Partner Connectivity Kit
           ✂️ SAP NetWeaver 7.0 <Support Release or Enhancement Package> ➔ Optional
              Standalone Units ➔ Partner Connectivity Kit ➔ <Database> ➔ Partner Connectivity Kit Installation
     ○ Perform other tasks or install additional components
       Go to ✂️ <Product> ➔ Software Life-Cycle Options ➔ and choose the required task.

6. Choose Next.

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

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

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

   [Note]
   J2EE Adapter Engine only
   ○ Make sure you use the Custom parameter mode.
   ○ On the UME Configuration screen, we recommend that you choose Use ABAP.

   [Caution]
   The signature of media is checked automatically during the Define Parameters phase while processing the Media Browser screens.

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

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

8. 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.

9. To start the installation, choose Next.

The installer starts the installation and displays the progress of the installation.

When the installation option has finished successfully, the installer displays the message Execution of <Option Name> has completed.

i Note

Enterprise Portal only: 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.

8. 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.

9. To start the installation, choose Next.

The installer starts the installation and displays the progress of the installation.

When the installation option has finished successfully, the installer displays the message Execution of <Option Name> has completed.

8. 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.

9. To start the installation, choose Next.

The installer starts the installation and displays the progress of the installation.

When the installation option has finished successfully, the installer displays the message Execution of <Option Name> has completed.

i Note

Enterprise Portal only: 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.

10. If required, install a dialog instance for a central system or distributed system.

11. If required, delete directories with the name sapinst_exe.xxxxx.xxxx after the installer has finished. Sometimes these 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. Save the copy to a physically separate medium, such as a medium or a USB drive that is 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.

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

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

i Note

This step is only required, if you did not specify during the Define Parameters phase that the operating system users are to be removed from the group sapinst after the execution of the installer has completed.
5.7 Additional Information About the Installer

The following sections provide additional information about the installer.

Useful Information About the Installer [page 87]
This section contains some useful technical background information about the installer and the installer GUI.

Interrupted Processing of the Installer [page 89]
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 91]

Troubleshooting with the Installer [page 92]
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 93]
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 80].

  If you need to run the SL Common GUI in accessibility mode, apply the standard accessibility functions of your web browser.

- **As soon as you have started the sapinst executable, the installer creates a .sapinst directory underneath the /home/<User> directory where it keeps its log files. <User> is the user with which you have started the installer.**

  After you have reached the Welcome screen and selected the relevant installer option for the SAP system or instance to be installed, the installer creates a directory sapinst_instdir where it keeps its log files, and which is located directly below the temporary directory. The installer finds the temporary directory by checking the value of the TEMP, TMP, or TMPDIR environment variable. If no value is set for these variables, the installer uses /tmp by default.
All log files which have been stored so far in the .sapinst folder are moved to the sapinst_instdir directory as soon as the latter has been created.

If you want the sapinst_instdir directory to be created in another directory than /tmp, set the environment variable TEMP, TMP, or TMPDIR to this directory before you start the installer.

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

⚠️ **Caution**

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

👉 **Recommendation**

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

- The installer extracts itself to a temporary directory called sapinst_exe.xxxxxx.xxxx, which is located in the environment variables TEMP, TMP, or TMPDIR. These files are deleted after the installer has stopped running.
- The temporary directory sapinst_exe.xxxxxx.xxxx sometimes remains undeleted. You can safely delete it.
- 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 command line parameter -p:
  
  `./sapinst -p`

- If you want to install an SAP system 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>
</table>
| **Retry** | 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. |
| **Stop** | 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. |
| **Continue** | The installer continues the installation from the current point. |
| **View Log** | Access installation log files. |
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 83].
2. Make sure that the installation media are still available.

   For more information, see Preparing the Installation Media [page 66].

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

4. The installer is restarting.

   The installer now starts and waits for the connection with the SL Common GUI. You can find the URL you require to access the SL Common GUI at the bottom of the shell from which you are running the installer.

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

   If you have a supported web browser (see Prerequisites for Running the Installer [page 80]) installed on the host where you run the installer, you can open this URL directly in the shell. Otherwise open the URL in a supported web browser that runs on another device.

   The SL Common GUI opens in the browser by displaying the **Welcome** screen.
Before you reach the Welcome screen, your browser might warn you that the certificate of the sapinst process on this computer could not be verified. Accept this warning to inform your browser that it can trust this site, even if the certificate could not be verified.

5. 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.

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

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform a new run</td>
<td>The installer does not continue the interrupted installation option. Instead, it moves the content of the old installer directory and all installer-specific files to a backup directory. Afterwards, you can no longer continue the old option. The following naming convention is used for the backup directory: ( \text{log}_&lt;\text{Day}&gt;_&lt;\text{Month}&gt;_&lt;\text{Year}&gt;_&lt;\text{Hours}&gt;_&lt;\text{Minutes}&gt;_&lt;\text{Seconds}&gt; )</td>
</tr>
</tbody>
</table>

Example

\( \text{log}\_01\_Oct\_2016\_13\_47\_56 \)

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:

\[ \text{sapdp}\_<\text{Instance}\_\text{Number}> = 32<\text{Instance}\_\text{Number}>/\text{tcp} \]

\[ \text{sapdp}\_<\text{Instance}\_\text{Number}>s = 47<\text{Instance}\_\text{Number}>/\text{tcp} \]
\[\text{sapgw}<\text{Instance\_Number}> = 33<\text{Instance\_Number}>/tcp\]
\[\text{sapgw}<\text{Instance\_Number}> = 48<\text{Instance\_Number}>/tcp\]

### Note
- There is a port created for every possible instance number, regardless of which instance number you specified during the installation. For example, for \(\text{sapgw}<\text{Instance\_Number}> = 33<\text{Instance\_Number}>/tcp\) the following range of entries is created:
  - \(\text{sapgw00} = 3300/tcp\)
  - \(\text{sapgw01} = 3301/tcp\)
  - \(\text{sapgw02} = 3302/tcp\)
  - \(\ldots\)
  - \(\text{sapgw98} = 3398/tcp\)
  - \(\text{sapgw99} = 3399/tcp\)
- If there is more than one entry for the same port number, this is **not** an error.

### 5.7.4 Troubleshooting with the Installer

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

#### Context

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

#### Procedure

1. Check SAP Note [1548438](#) for known installer issues.
2. If an error occurs during the **Define Parameters** or the **Execute Service** phase, do one of the following:
   - 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.
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 89].

3. If you cannot resolve the problem, report an incident using the appropriate subcomponent of BC-INS*.

For more information about using subcomponents of BC-INS*, see SAP Note 1669327.

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

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

**Note**

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

**Prerequisites**

- SAP Support requests you to use the Step State Editor.
- Make sure that the host where you run the installer meets the requirements listed in Prerequisites for Running the Installer [page 80].

**Procedure**

1. Start the installer from the command line as described in Running the Installer [page 83] 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 installation options:

- Central, distributed, or high-availability system
- Dialog instance

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

Central, Distributed, or High-Availability System

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

You can install optional standalone units J2EE Adapter Engine, Partner Connectivity Kit, Application Sharing Server only as a central system.

You have to complete the following post-installation steps, which are described in more detail in the linked chapters:

1. If required, you perform a full installation backup [page 119] 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 52].
3. You check whether you can log on to the Application Server Java [page 96].
4. If you have installed SAP NetWeaver Portal or SAP NetWeaver Portal Core Component, you check whether you can log on to the SAP NetWeaver Portal [page 98].
5. If you have installed Development Infrastructure, you check whether you can log on to the Development Infrastructure [page 99].
6. You provide access to the SAP NetWeaver Administrator [page 100].
7. You install the SAP license [page 101].
8. If you installed a high-availability system, you set up the licenses for high availability [page 101].
9. You configure the remote connection to SAP support [page 103].
10. For production systems it is highly recommended that you connect the system to SAP Solution Manager [page 103].
11. You apply the latest kernel and Support Package stacks [page 105].
12. You configure the user management [page 106].
13. You ensure user security [page 107].
14. To perform basic configuration steps, you run the Configuration Wizard [page 112].
15. If you have installed J2EE Adapter Engine as an optional standalone unit, you perform Post-Installation Steps for the J2EE Adapter Engine (Optional Standalone Unit) [page 113].
16. If you have installed Partner Connectivity Kit (PCK) as an optional standalone unit, you perform Post-Installation Steps for the PCK (Optional Standalone Unit) [page 116].
17. You enable the database [page 118].
18. You perform a full backup of the installation [page 119].
19. You check the Master Guide for your SAP Business Suite application or SAP NetWeaver application (chapter Configuration of Systems and Follow-Up Activities) for further implementation and configuration steps, such as language installation, monitoring, work processes, transports, SAP license, printers, system logs, and connectivity to system landscape directory (SLD).

**Dialog Instance**

You have to complete the following post-installation steps, which are described in more detail in the linked chapters:

1. If required, you perform an installation backup [page 119] 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 52].
3. You check whether you can log on to the Application Server Java [page 96].
4. If you have installed SAP NetWeaver Portal or SAP NetWeaver Portal Core Component on the central instance, you check whether you can log on to the portal [page 98] from the dialog instance host.
5. If you have installed Development Infrastructure on the central instance, you check whether you can log on to the Development Infrastructure [page 99] from the dialog instance host.
6. If you installed a dialog instance in a heterogeneous UNIX environment, that is on a host with a UNIX operating system different from the UNIX operating system of the central instance, you have to update the kernel of the dialog instance [page 106].
7. You ensure user security [page 107].
8. You perform an installation backup [page 119] for the dialog instance.

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

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.

<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>The user name that you specified during the installation. The default name is 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 AS Java with a URL using a web browser from your client machines. To log on to the application server Java, proceed as follows:

1. Start a web browser and enter the following URL:
   
   ```
   http://<Hostname_of_AS_Java_Server>:5<Instance_Number>00
   ```
   
   **Note**
   
   You must always enter a two-digit number for `<Instance_Number>`. For example, do **not** enter 1 but instead enter **01**.

   **Example**
   
   If you installed SAP NetWeaver Application Server for Java on host `saphost06` and the instance number of your SAP NetWeaver Application Server for Java is 04, enter the following URL:
   
   ```
   http://saphost06:50400
   ```
   
   The start page of the SAP NetWeaver Application Server for Java appears in the web browser.

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

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

### Prerequisites

The SAP system is up and running.

### Context

This procedure applies when you install usage type NetWeaver Enterprise Portal Core Components (EPC) only and when you install it together with usage type SAP NetWeaver Enterprise Portal (EP):

#### Note

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

<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>The user name that you specified during the installation. The default name is 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 NetWeaver 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: \texttt{http://<Hostname_Of_J2EE_Server>:5<Instance_Number>00/irj}

\begin{itemize}
  \item Note
  \begin{itemize}
    \item You must always enter a two digit number for \texttt{<Instance_Number>}. For example, do \textbf{not} enter 1 but instead enter 01.
  \end{itemize}
\end{itemize}

\begin{itemize}
  \item Example
  \begin{itemize}
    \item If you installed the SAP NetWeaver Portal on host saphost06 and the instance number of your Application Server Java is 04, enter the following URL:
    \begin{verbatim}
    http://saphost06:50400/irj
    \end{verbatim}
  \end{itemize}
\end{itemize}

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

6.4 Logging On to the SAP NetWeaver Development Infrastructure (NWDI)

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

Procedure

1. Start a web browser and enter the following URL: \texttt{http://<hostname_of_J2EE_Engine_Server>:5<Instance_Number>00/devinf}

\begin{itemize}
  \item Note
  \begin{itemize}
    \item You must always enter a 2-digit number for \texttt{<Instance_Number>}. For example, do \textbf{not} enter 1 but instead enter 01.
  \end{itemize}
\end{itemize}

\begin{itemize}
  \item Example
  \begin{itemize}
    \item 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:
    \begin{verbatim}
    http://saphost06:50400
    \end{verbatim}
  \end{itemize}
\end{itemize}

2. Log on with the \texttt{NWDI_ADM} user.

The start page \textit{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

Due to security restrictions, the SAP NetWeaver Administrator can only be accessed **locally** via http://<Hostname_Of_J2EE_Engine_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.

**Context**

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

⚠️ **Caution**

Before the temporary license expires, you must apply for a permanent license key from SAP.

We recommend that you apply for a permanent license key as soon as possible after installing your system.

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

**Procedure**

Install the SAP license as described in SAP Library at [http://help.sap.com/nw](http://help.sap.com/nw) → **SAP NetWeaver Platform** → **SAP NetWeaver 7.0 <Including Enhancement Package>** → **Application Help** → **Key Areas of SAP NetWeaver** → **Solution Life Cycle Management by Key Capability** → **SAP Licenses** → **SAP License Key / SAP Licensing Procedure**

If you have installed a high-availability system, proceed as described in High Availability: Setting Up Licenses [page 101].

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

Every SAP system needs a central license, which is determined by the environment of the message server. Since SAP’s high-availability (HA) solution stipulates 2 or more cluster nodes (host machines) where the message server is enabled to run, you have to order as many license keys [page 101] 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, 1 key for each machine.

SAP has implemented a license mechanism for transparent and easy use with switchover solutions and clustered environments. Your customer key is calculated on the basis of local information on the message server host. This is the host machine where the Java central services instance (SCS instance) runs. There is no license problem when only the database is switched over.

Procedure

1. Make sure that the Java central services instance (SCS instance) on the primary host, node A, is running.
2. To find the hardware ID of the primary host, run the Visual Administrator on node A and choose CI Host License Adapter.
   The hardware ID is displayed in the Visual Administrator.
3. Perform a switchover of the Java central services instance (SCS instance) to another node in the cluster and repeat the previous step.
   Repeat this for all remaining nodes in the cluster.
4. To obtain the two license keys, enter the hardware IDs for the primary and backup hosts at:
   [http://support.sap.com/licensekey](http://support.sap.com/licensekey)
5. To import the files containing the two licenses, run the Visual Administrator on the node where the SCS instance is running and choose CI Host License Adapter.
6. Perform a switchover of the Java central services instance (SCS instance) 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 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 Version 7.1 SPS <No> Application Help (English) SAP Solution Manager Operations Managing System Landscape Information Managing Technical System Information Register Technical Systems Automatically by Data Suppliers

installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.02 on UNIX: SAP Adaptive Server Enterprise
If your SAP Solution Manager release is 7.2:


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

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.

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:

- If your SAP Solution Manager release is 7.2:

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

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

- If your SAP Solution Manager release is 7.1:

- If your SAP Solution Manager release is 7.2:

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 7.02 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.

Procedure

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

```bash
su - root
cd <Kernel_Directory>
./saproot.sh <SAPSID>
exit
```
6.11 Dialog Instances in a Heterogeneous UNIX Environment only: Updating the Kernel

If you have installed dialog instances on hosts that have a different UNIX operating system than the central instance, you have to update the kernel of the newly installed dialog instances.

Procedure

1. Stop the dialog instance as described in Starting and Stopping SAP System Instances [page 158].
2. Update the kernel to the same level as the central instance by replacing the old kernel with the new one as follows:
   a. Log on as user <sapsid>adm to the host of the dialog instance to be updated.
   b. Download the required kernel, as described in SAP Note 19466.
   c. Back up the kernel directory 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 located in the kernel directory):

   ```
   su - root
   cd <kernel directory>
   ./saproot.sh <SAPSID>
   exit
   ```
3. Restart the dialog instance as described in Starting and Stopping SAP System Instances [page 158].

6.12 Configuring User Management

During the installation of your SAP system, you specified the database of the AS Java as the initial data source of the User Management Engine (UME) (see SAP System Parameters [page 38]).

After the installation of your SAP system has finished, you can still change the data source of the UME to a directory service.

During the installation of your SAP system, you specified one of the following initial data sources of the User Management Engine (UME) (see SAP System Parameters [page 38]):

- Database of the AS 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 data source changes are supported:

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

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

http://help.sap.com/nw\SAP NetWeaver Platform\SAP NetWeaver 7.0 <Including Enhancement Package>\Application Help\SAP NetWeaver by Key Capability\Security\Identity Management\User Management of the Application Server Java\Configuring User Management\UME Data Sources

---

### 6.13 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 these users:

- Operating system users
- SAP system users
- Users in the SAP NetWeaver Development Infrastructure (NWDI)

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

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

**Recommendation**

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.

For more information, see:

http://help.sap.com/nw\SAP NetWeaver Platform\SAP NetWeaver 7.0 <Including Enhancement Package>\Application Help\SAP NetWeaver by Key Capability\Security\Network and Transport Layer Security

**Caution**

Make sure that you perform this procedure **before** the newly installed SAP system goes into production. For security reasons, you also need to copy the installation directory to a separate, secure location – such as a separate storage medium – and then delete the installation directory.

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

Example


Operating System and Database Users

After the installation, operating system users for SAP system, dataset, 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 38].

Table 34: 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 &lt;sapsid&gt;adm</td>
<td>sapsys (sapinst as secondary group)</td>
</tr>
<tr>
<td>syb&lt;dbsid&gt;</td>
<td>sapsys (sapinst as secondary group)</td>
</tr>
</tbody>
</table>

Table 35: SAP Host Agent User

<table>
<thead>
<tr>
<th>User</th>
<th>User Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system user</td>
<td>sapadm</td>
<td>SAP system administrator</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>
The following tables show these users together with recommendations on how you can ensure the security of these users:

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: External ABAP System</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>The name that you gave this user when you created it manually in the external ABAP system</td>
<td>This user has administrative permissions for user management and its 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 J2EE Engine Config Tool.</td>
</tr>
<tr>
<td>Guest</td>
<td>The name that you gave this user when you created it manually in the external ABAP system</td>
<td>This user is used for anonymous access. Lock this user for interactive logon.</td>
</tr>
<tr>
<td>SDM</td>
<td>SDM</td>
<td>This user is used to access the Software Deployment Manager (SDM) in the Java system.</td>
</tr>
<tr>
<td>Communication user for the J2EE Engine</td>
<td>The name that you gave this user when you created it manually in the external ABAP system</td>
<td>This user is used for the communication between the ABAP system and the Java system. Specify this user as a Communications user and not as a dialog user. This user exists in at least the SAP system client that you specified during the installation.</td>
</tr>
<tr>
<td>Users for Adobe Document Services (ADS)</td>
<td>The name of this user is ADSUSER. This user resides in the external ABAP system.</td>
<td>This user exists in at least clients 000 and 001 of the external ABAP system. You must have created this user manually in the external ABAP system before you started the installation.</td>
</tr>
<tr>
<td>ADS_AGENT</td>
<td>This user resides in the external ABAP system.</td>
<td>This user exists in at least clients 000 and 001 of the external ABAP system. You must have created this user manually in the external ABAP system before you started the installation.</td>
</tr>
</tbody>
</table>
### User Name Storage: External ABAP System

<table>
<thead>
<tr>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data supplier user for System Landscape Directory (SLD) (optional)</td>
<td>This user exists in at least clients 000 and 001 of the external ABAP system</td>
</tr>
<tr>
<td>ABAP API user for System Landscape Directory (SLD) (optional)</td>
<td>This user exists in at least clients 000 and 001 of the external ABAP system</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 has administrative permissions for user management and its 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 J2EE Engine Config Tool.</td>
</tr>
<tr>
<td>Guest</td>
<td>This user is used for anonymous access.</td>
</tr>
<tr>
<td>SDM</td>
<td>This user is used to access the Software Deployment Manager (SDM) in the Java system.</td>
</tr>
<tr>
<td>ADSUSER</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 J2EE Engine Config Tool.</td>
</tr>
<tr>
<td>ADS_AGENT</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 J2EE Engine Config Tool.</td>
</tr>
</tbody>
</table>

### Recommendation

We recommend that you use strong password and auditing policies for this user.

### Users in the SAP NetWeaver

To change passwords at the Development Infrastructure (NWDI):

**Note**

The installer created this user automatically if you chose Configure local SLD during the Define Parameters phase.
If you chose usage type (software unit) **SAP NetWeaver Development Infrastructure (DI)** during the installation, users in the SAP NetWeaver Development Infrastructure (NWDI) are available after the installation as listed in the following table:

Table 38:

<table>
<thead>
<tr>
<th>User</th>
<th>User Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator of the SAP NetWeaver Development Infrastructure (NWDI) and password</td>
<td>NWDI_ADM</td>
<td>Administrator of the NWDI</td>
</tr>
<tr>
<td>Caution</td>
<td></td>
<td>This user has extensive authorizations. Make sure that you assign a secure password.</td>
</tr>
<tr>
<td>Developer in the SAP NetWeaver Development Infrastructure (NWDI) and password</td>
<td>NWDI_DEV</td>
<td>Developer in the NWDI</td>
</tr>
<tr>
<td>Landscape Directory Service User in the SAP NetWeaver Development Infrastructure (NWDI) and password</td>
<td>NWDI_CMSADM</td>
<td>Administrator of the NWDI Change Management System (CMS)</td>
</tr>
<tr>
<td>Caution</td>
<td></td>
<td>Do not log on with this user. It is used by the system for internal communication.</td>
</tr>
</tbody>
</table>

**More Information**

- For more information about managing Java users, see:
  

- For more information about Java administration tools for user maintenance, see:
  
  [http://help.sap.com/nw](http://help.sap.com/nw) ➔ **SAP NetWeaver Platforms** ➔ **SAP NetWeaver 7.0 <Including Enhancement_Package>** ➔ **Application Help** ➔ **SAP NetWeaver by Key Capability** ➔ **Application Platform by Key Capability** ➔ **Java Technology** ➔ **Administration Manual** ➔ **J2EE Engine** ➔ **J2EE Engine Administration Tools**
6.14 Running the Configuration Wizard

This section provides information about how to run the configuration wizard for the SAP NetWeaver usage types.

⚠️ Caution

You can run the configuration wizard only once and only directly after you installed and patched your SAP system.

You cannot use the configuration wizard after:

- Upgrade
- Installation of additional usage types in an existing SAP system
- System copy

In these cases, you need to manually perform the corresponding configuration steps.

**BI Java only:** This does not apply to configuration tasks for BI Java. For more information about BI Java, see SAP Note [917950](http://help.sap.com/nw702). We recommend that you check the configuration of BI Java using SAP Note [937697](http://help.sap.com/nw702).

To configure an SAP NetWeaver usage type, proceed as described in the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
</table>
| SAP NetWeaver 7.0 EHP2  
| SAP NetWeaver 7.0 EHP1  
| SAP NetWeaver 7.0  

**More Information**

- If you have SAP Solution Manager 7.1, see the configuration structure of your implementation project in SAP Solution Manager.
- SAP Note [923359](http://help.sap.com/nw702) » Collective Note: Configuration Wizard – Template Installer
6.15 Post-Installation Steps for the J2EE Adapter Engine (Optional Standalone Unit)

After the installation has finished successfully, you need to perform the following post-installation steps for the J2EE Adapter Engine.

- **Configuring the SLD Data Supplier Service in the Visual Administrator** [page 113]
  This section describes how you can configure the SLD Data Supplier Service in the Visual Administrator.

- **Configuring the Gateway Service of the Central Integration Server** [page 114]
  On the J2EE Adapter Engine host, you need to enter the gateway service of the central integration server in the services file as described in this section.

- **Adding Connection Parameters to Central Exchange Profile** [page 115]
  This section describes how you can add connection parameters to the central exchange profile.

### 6.15.1 Configuring the SLD Data Supplier Service in the Visual Administrator

This section describes how you can configure the SLD Data Supplier Service in the Visual Administrator.

**Procedure**

2. Choose `Cluster ➔ Server ➔ Services ➔ SLD Data Supplier`.
3. On the `Runtime` tab in the right frame, select the `HTTP Settings` tab.
4. Enter the data required for the HTTP connection from the SLD service to the SLD as follows:
   - **Host**: Enter the name of the host on which the SLD bridge runs.
   - **Port**: Specify the HTTP standard access port of the SLD. This is the HTTP port of the J2EE engine. The following naming convention applies: `5<Java_instance_number>00`.
   - **User**: Specify a Java user that already exists on the host on which the SLD Bridge runs (for example `PISUPER`).
   - **Password**: Enter the user password.

   If you want to use HTTPS for the connection from the SLD service to the SLD, choose `Use HTTPS`. The `Trust Store` field is now ready for input.

---

Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.02 on UNIX: SAP Adaptive Server Enterprise

Post-Installation

PUBLIC
5. Save your entries.

An error message appears if an error occurs. If your entries have been saved successfully, the connection data is saved in encrypted form in the secure store in the database.

**Note**

Alternatively, you can use an RFC connection to send data to the SLD (tab RFC Settings). However, we recommend that you use this type of connection for test purposes only.

6. If you want to test your settings by sending test data to the SLD, click the blue arrow with the quick info text Trigger data transfer to System Landscape Directory.

7. To apply the new configuration immediately, restart the SLD service as follows:
   a. On the Cluster tab, choose SLD Data Supplier with the secondary mouse button.
   b. Choose Stop.
   c. When the service has been stopped, again choose SLD Data Supplier with the secondary mouse button and choose Start.

   The service starts within a few seconds and the first data transfer to the SLD takes place after several minutes.

### 6.15.2 Configuring the Gateway Service of the Central Integration Server

On the J2EE Adapter Engine host, you need to enter the gateway service of the central integration server in the services file as described in this section.

#### Procedure

1. Open the services file using a text editor. You can find the file in the directory /etc/

2. Enter the gateway service entry as follows:

   ```
   sapgw<xx> <port>/tcp #SAP System Gateway Port
   ```

   where `<xx>` is the instance number of SAP NetWeaver on which usage type PI is running and `<port>` is the gateway port of SAP NetWeaver.
6.15.3 Adding Connection Parameters to Central Exchange Profile

This section describes how you can add connection parameters to the central exchange profile.

Procedure

1. On the noncentral J2EE Adapter Engine server, enter the following URL in a browser:

   \[http://<AE_server>:<AE_HTTP_Port>/exchangeProfile\]

2. Choose Connections.

3. Enter the respective values.

   \[Note\]
   
   If you do not know the values, call the Exchange Profile on the PI server at \[http://<PI_server>:<HTTP_Port>/exchangeProfile\] and choose Connections. You can find the values up there.

4. Under Exchange ProfileConnections, check the existence of the parameter \[com.sap.ii.connect.integrationserver.sld.name\]. If it exists, make sure that it points to the PI server. If required, adapt it manually as follows:

   \[is.<PI_server_instance_number>.<PI_server_hostname>\]

5. Restart the application \[com.sap.ii.af.cpa.app\] in the Visual Administrator or reboot the J2EE Engine.

Results

You now find the noncentral J2EE Adapter Engine in the System Landscape Directory (SLD) and under the node **Non-central Adapter Engines** in the Runtime Workbench of the PI server.
6.16 Post-Installation Steps for the PCK (Optional Standalone Unit)

You must perform the following steps on the central instance host on which you have installed the Partner Connectivity Kit (PCK).

**Note**

You need an SAP NetWeaver AS Java system with release 7.0 EHP 1 or higher and usage type Process Integration (PI) to connect to.

**Configuring the PCK**

After the installation you have to configure the PCK by performing the following steps.

**Starting the PCK**

This section describes how to start the PCK.

**Changing Passwords for User Management (UME)**

After installation you need to log on to the UME and change the passwords for users pckuser and pckreceiver.

### 6.16.1 Configuring the PCK

After the installation you have to configure the PCK by performing the following steps.

#### Procedure

1. Configure the ai1.properties.
   
   For more information, see SAP Note [746328](#).

2. Change the properties of the J2EE Service SAP NetWeaver XI AF CPA Cache Service.
   
   For more information, see SAP Note [746328](#).

3. Assign the required user roles.
   
   For more information, see SAP Note [746328](#).

4. Change the properties of the J2EE Service SAP NetWeaver XI AF Core Service.
   
   For more information, see SAP Note [1156008](#).
6.16.2 Starting the PCK

This section describes how to start the PCK.

Procedure

1. On your PCK host, enter the following URL in your Web browser:

   \[ http://<PCK\_host>:<J2EE\_port>/pck/start \]

   where \(<PCK\_host>\) is the host name on which you installed the PCK and \(<J2EE\_port>\) is the HTTP port of the SAP J2EE engine with the following naming convention: \(5<\text{J2EE\_instance\_number}>00\) (for example 50000 if your J2EE instance is 00).

2. Starting the PCK GUI on a Client:

   To start the PCK GUI on a client, the Java™ Web Start 1.4.2 must be installed on that client. For more information on how to install and configure Java™ Web Start 1.4.2, choose Client Installation Guidelines on the PCK start page.

   To start the PCK GUI, choose PCK on the PCK start page.

   If you start the PCK GUI for the first time on the client, the software packages are prepared for download to the client. After a few moments (depending on the hardware of your J2EE host) you may use the same link again to launch the PCK UI.

6.16.3 Changing Passwords for User Management (UME)

After installation you need to log on to the UME and change the passwords for users pckuser and pckreceiver.

Procedure

1. On your PCK host, log on to User Management by entering the following URL in your Internet browser:

   \[ http://<host>:<HTTP\_port>/useradmin \]

2. With your first logon, you are prompted to change the passwords for users pckuser and pckreceiver.
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. 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 ➤ DBA Cockpit Framework ➤ Data Collectors and Admin Procedures ➤](http://service.sap.com/instguides) SAP NetWeaver ➤ SAP NetWeaver in the DBA Cockpit.

   For further details, refer to the database administration guide. You can find the administration guide in the Service Marketplace: [http://service.sap.com/instguides](http://service.sap.com/instguides) ➤ SAP NetWeaver ➤ SAP NetWeaver <Release> ➤ Operations ➤ Database-Specific Guides ➤.

2. Manually activate the Internet Communication Framework (ICF) service to ensure that the DBA Cockpit functions correctly. It is required to access Web Dynpro ABAP-based applications. It is not activated by default. For more information, see SAP Note [1245200](http://service.sap.com/instguides).

3. Apply the latest patches for the DBA Cockpit. For more information, see SAP Note [1558958](http://service.sap.com/instguides).

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](http://service.sap.com/instguides) 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](http://service.sap.com/instguides).
6.18 Performing a Full Installation Backup

You must perform a **full offline backup** at the end of the installation. This procedure also describes how to use the back-up data for a restore.

**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.

**Prerequisites**

You have logged on as user `<sapsid>adm` and stopped the SAP system and database.

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**

**Note**

The following only applies to a standard installation.

1. Back up the following file systems:
   - `/usr/sap/<SAPSID>
   - `/usr/sap/trans
   - `/<sapmnt>/<SAPSID>
   - Home directory of the user `<sapsid>adm

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

      **Note**
      
      Linux only: You can also execute the following command to manually create a compressed GNU *tar* archive that contains all installed files and save it to the file system:
      ```
      tar -czf <ARCHIVENAME>.tgz <File_System>
      ```
2. Back up the operating system using operating system means. This saves the structure of the system and all configuration files, such as file system size, logical volume manager configuration and database configuration data.

**Restoring Your Backup**

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

⚠️ **Caution**
Check for modifications to 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. Execute the following commands to restore the data:
   - Restoring the data from tape:
     ```
     cat <tape_device> | compress -cd | tar -xf -
     ```
   - Restoring the data from the file system:
     ```
     cat ARCHIVENAME.tar.Z | compress -cd | tar -xf -
     ```

**Note**

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

```
 tar -xzf <ARCHIVENAME>.tgz
```
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, 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.

\section*{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 \textit{Required File Systems and Directories [page 56]} 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:

\begin{itemize}
  \item SAP application database
  \item SAP ASE master database
\end{itemize}

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.

\section*{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. The 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

### 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>
</table>
| Software | Software
SAP recommends to 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.

**Note**

Update the OS libraries on the host that will run the replication server.

Installation of fileset xlsmp.rte is required.
<table>
<thead>
<tr>
<th>Area:</th>
<th>Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></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><strong>ASE Server Names</strong></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. The SAP database name is the same on both sites.</td>
</tr>
<tr>
<td><strong>Directories</strong></td>
<td>For an SAP installation, the replication environment must be installed in the following directory:</td>
</tr>
<tr>
<td></td>
<td><code>/sybase/&lt;SID&gt;_REP</code></td>
</tr>
<tr>
<td></td>
<td>Reserve at least 6 GB free space for software and configuration files.</td>
</tr>
<tr>
<td></td>
<td>The initial replication server partition file is placed in a folder at:</td>
</tr>
<tr>
<td></td>
<td><code>/sybase/&lt;SID&gt;_REP/repdata_1</code></td>
</tr>
<tr>
<td></td>
<td>You can specify another folder for placing replication server partition files during installation. This allows distribution of disk I/O to several disks.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td><strong>TCP/IP ports</strong></td>
<td>In addition to the ASE TCP/IP ports, the following ports are required for the replication environment:</td>
</tr>
<tr>
<td></td>
<td>• Replication server: 4905</td>
</tr>
<tr>
<td></td>
<td>• Replication server system database: 4906</td>
</tr>
<tr>
<td></td>
<td>• Replication server system database replication agent: 4907</td>
</tr>
<tr>
<td></td>
<td>• DR agent RMI: 4908</td>
</tr>
<tr>
<td></td>
<td>• DR agent: 4909</td>
</tr>
<tr>
<td></td>
<td>The values for the TCP/IP ports are default values. It is possible to customize the port numbers.</td>
</tr>
<tr>
<td></td>
<td>The primary and the standby site can use the same port numbers.</td>
</tr>
<tr>
<td><strong>Database Time</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Synchronization</strong></td>
<td>The following users are required on both sites:</td>
</tr>
<tr>
<td></td>
<td>• <code>sapsa</code></td>
</tr>
<tr>
<td></td>
<td>• <code>sapsso</code></td>
</tr>
<tr>
<td></td>
<td>• Replication user (<code>&lt;SID&gt;_maint</code>)</td>
</tr>
<tr>
<td></td>
<td>• DR agent administrator (<code>DR_admin</code>)</td>
</tr>
<tr>
<td></td>
<td>The <code>sapsa</code> and <code>sapsso</code> logins and their passwords must be identical across both databases. The replication user and the DR agent administrator are created by the SAP installer.</td>
</tr>
<tr>
<td></td>
<td>Be aware that the database user <code>DR_admin</code> is included in the secure storage of the SAP system, should you want to change the password.</td>
</tr>
</tbody>
</table>
### 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: Central Instance at the Primary Site** [page 125]
- **Co-Located Replication Topology: Central Instance on a Separate Server** [page 127]
- **Dis-Located Replication Topology: Central Instance on a Separate Server** [page 129]

**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 sides.

### 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 Central Instance (CI) is also installed on one of the database servers.
Figure 17: Co-Located Replication Topology: Central Instance at the Primary Site

Prerequisites

You have installed an SAP application on SAP ASE. The Central Instance (CI) 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:

i 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 7.0 including <Enhancement Package> ➤ Software Life-Cycle Options ➤ Database Tools ➤ 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 7.0 including <Enhancement Package> ⊳
   Software Life-Cycle Options ⊳ Database Tools ⊳ 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: Central Instance 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 central instance (CI) is installed on a separate server.
Prerequisites

You have installed an SAP application on SAP ASE. The Central Instance (CI) 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: [ ] SAP NetWeaver 7.0 including <Enhancement Package> [ ] Software Life-Cycle Options [ ] Database Tools [ ] SAP ASE [ ] 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 7.0 including <Enhancement Package> [ ] Software Life-Cycle Options [ ] Database Tools [ ] 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 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 Dis-Located Replication Topology: Central Instance on a Separate Server

The following replication topology shows a dis-located scenario. The database, the SAP Replication Server, and the central instance (CI) are installed on separate hosts.
**Figure 19: Dis-Located Replication Topology**

**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 7.0 including <Enhancement Package>]
   Software Life-Cycle Options > Database Tools > 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 7.0 including <Enhancement Package>]
   Software Life-Cycle Options > Database Tools > 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 7.0 including <Enhancement Package>]
   Software Life-Cycle Options > Database Tools > 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**
  
  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.

- **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.

7.4.4.1 Manual Materialization

The following methods are available:

- Using Single Database Dump and Load
- Using Database and Transaction Dump and Load
- Using Snapshot Materialization

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>`.

**Note**

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>`:

```bash
Example

```/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>`:

```bash
Example

```isql -X -U DR_admin -S <hostname>:<DR agent port> <<EOF
<DR_admin password>
shutdown
go
EOF```

**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>`:

```bash
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>`:

```plaintext
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.

- **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.

  - **Unmark databases for replication and remove replication software**
  - This option

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

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.

9.1 Integration of LDAP Directory Services

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

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

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

Note

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

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

If a directory other than the Active Directory also supports the LDAP protocol, the SAP system can take advantage of the information stored there. For example, if there is an LDAP directory on a UNIX or Windows server, you can configure the SAP system to use the information available there. In the following text, directories other than the Active Directory that implement the LDAP protocol are called generic LDAP directories.

Prerequisites

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

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

Features

In the SAP environment, you can exploit the information stored in an Active Directory or generic LDAP directory by using:

- SAP Logon
- The SAP Microsoft Management Console (SAP MMC)
  For more information about the automatic registration of SAP components in LDAP directories and the benefits of using it in SAP Logon and SAP MMC, see the documentation SAP System Information in Directory Services at:  
- The SAP Management Console (SAP MC)

SAP Logon

Instead of using a fixed list of systems and message servers, you can configure the SAP Logon in the sapmsg.ini configuration file to find SAP systems and their message servers from the directory. If you configure SAP logon to use the LDAP directory, it queries the directory each time Server or Group selection is chosen to fetch up-to-date information on available SAP systems.

To use LDAP operation mode, check that the sapmsg.ini file contains the following:

```
[Address]
Mode=LDAPdirectory
LDAPserver=
LDAPnode=
LDAPoptions=
```
Distinguish the following cases:

- If you use an Active Directory, you must set `LDAPoptions="DirType=NT5ADS"`. For more information, see the SAP system profile parameter `ldap/options`.

- You must specify the directory servers (for example, `LDAPServers=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. If the SAP system has been prepared correctly, the SAP MC presents and analyzes system information that it gathers from various sources, including generic LDAP Directory.

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

Table 42:

<table>
<thead>
<tr>
<th>Release</th>
<th>Path on SAP Help Portal</th>
</tr>
</thead>
<tbody>
<tr>
<td>● SAP NetWeaver 7.0</td>
<td><a href="http://help.sap.com/viewer/p/SAP_NETWEAVER">http://help.sap.com/viewer/p/SAP_NETWEAVER</a>&lt;Including Enhancement Package&gt;</td>
</tr>
<tr>
<td>● SAP NetWeaver 7.0 including enhancement package 1</td>
<td>Application Help ▶ SAP NetWeaver by Key Capability</td>
</tr>
<tr>
<td>● SAP NetWeaver 7.0 including enhancement package 2</td>
<td>Application Platform by Key Capability ▶ Java Technology</td>
</tr>
<tr>
<td></td>
<td>Administration Manual ▶ J2EE Engine ▶ J2EE Engine</td>
</tr>
<tr>
<td></td>
<td>Administration Tools ▶ SAP Management Console</td>
</tr>
<tr>
<td>SAP NetWeaver 7.0 including enhancement package 3</td>
<td><a href="https://help.sap.com/viewer/p/SAP_NETWEAVER_703">https://help.sap.com/viewer/p/SAP_NETWEAVER_703</a></td>
</tr>
<tr>
<td></td>
<td>Application Help ▶ SAP NetWeaver by Key Capability</td>
</tr>
<tr>
<td></td>
<td>Solution Life Cycle Management by Key Capability ▶ SAP</td>
</tr>
<tr>
<td></td>
<td>Management Console</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 where you want to use Active Directory Services and choosing [Product] ▶ Software Life-Cycle Options ▶ LDAP Registration ▶ Active Directory Configuration. For more information about running the installer on Windows, see the documentation Installation Guide - Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver <Release> on Windows: <Database> at http://support.sap.com/sltoolset ▶ System Provisioning ▶ Installation Option.

Note

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

Configuration Tasks for Generic LDAP Directories

To configure other LDAP directories, refer to the documentation of your directory vendor.
Enabling the SAP System LDAP Registration

Once you have correctly configured your directory server, you can enable the LDAP registration of the SAP system by setting some profile parameters in the default profile.

To do this, run the installer once for your system and choose \texttt{<Product> \textgreater \ Software Life-Cycle Options \ LDAP Registration \ LDAP Support}.\texttt{\ }

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 \texttt{ldappasswd pf=<Instance_Profile>}. The information is encrypted for storage in \texttt{DIRGLOBAL} 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 \texttt{dev_ldap*}. The registration is updated every time a component starts.

9.2 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 AS Java of your SAP Java system to be installed. To do this, you configure the User Management Engine (UME) of the J2EE engine for the user management of the external ABAP system.

Prerequisites

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

Context

\textbf{Note}

If you want to install the J2EE Adapter Engine as an optional standalone unit, you have to configure the User Management Engine (UME) for the ABAP UME of the SAP NetWeaver Process Integration (PI) system.

If you want to connect more than one Java system to the same ABAP system, you need to work out a concept for the communication, administrator, and guest users for each engine.
You can take one of the following approaches:

<table>
<thead>
<tr>
<th>Approach</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Java system uses different users</td>
<td>No interdependencies between the connected engines</td>
<td>Initially more administration to create the users in the ABAP system</td>
</tr>
<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 J2EE Engines</td>
</tr>
</tbody>
</table>

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

**Recommendation**

For security reasons, we recommend the first approach.

**More Information**


- For more information about creating users and roles in an ABAP system, see: [SAP NetWeaver 7.0](https://help.sap.com/viewer/p/SAP_NETWEAVER) <Including Enhancement Package> [Application Help > SAP NetWeaver by Key Capability > Security > Identity Management > User and Role Administration of Application Server ABAP](https://help.sap.com/viewer/p/SAP_NETWEAVER)


**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.
   ○ If you want to use Adobe Document Services (ADS), do the following:
     ○ Check that the role SAP_BC_FPADS_ICF exists.
     ○ Create a role named ADSCallers. You do not need to maintain authorization data or generate any profiles for this role.
   ○ If you want to install the system with a local System Landscape Directory, check that the following roles exist and make sure that their profiles are generated:
     ○ SAP_SLD_CONFIGURATOR
     ○ SAP_SLD_ADMINISTRATOR
     ○ SAP_SLD_DEVVELOPER
     ○ SAP_SLD_GUEST
     ○ SAP_SLD_ORGANIZER
   
   b. Call transaction SU01 to do the following:
   ○ Create a new communication user and assign it to the role SAP_BC_JSF_COMMUNICATION_RO. We recommend that you do the following:
     ○ Name this user SAPJSF. You can use any password.
     ○ Assign this user the role SAP_BC_JSF_COMMUNICATION_RO for read-only (display) access to user data with Java tools. If you intend to maintain user data (that is, to change, create, or delete users) with Java tools, you need to assign the role SAP_BC_JSF_COMMUNICATION instead.
     ○ Assign this user the type Communications under Logon data to make sure that it can only be used for communication connections between systems and not as a dialog user.
   ○ Create a new administrator user for the J2EE engine and assign it to role SAP_J2EE_ADMIN. We recommend that you name this user J2EE_ADM_<SAPSID_Java_System>. You can use any password.
   ○ Create a new guest user for the J2EE engine and assign it to role SAP_J2EE_GUEST. We recommend that you name this user J2EE_GST_<SAPSID_Java_System>. You can use any password.
   ○ If you want to use Adobe Document Services (ADS), do the following:
     ○ Create a user ADSUSER for basic authentication and assign this user the role ADSCallers. You can use any password.
     ○ Create a user ADS_AGENT and assign this user the role SAP_BC_FPADS_ICF. You can use any password.
   ○ If you want to install the system with a local System Landscape Directory, do the following:
     1. Create an SLD Data supplier user. We recommend that you name this user SLDDSUSER. You can use any password.
     2. Assign this user the following roles:
        ○ SAP_SLD_CONFIGURATOR
○ SAP_SLD_ADMINISTRATOR
○ SAP_SLD_DEVELOPER
○ SAP_SLD_GUEST
○ SAP_SLD_ORGANIZER

○ If you want to install Development Infrastructure (DI), create the following users:
  ○ NWDI_ADM
    You do not need to assign a role and you can use any password.
  ○ NWDI_DEV
    You do not need to assign a role and you can use any password.
  ○ NWDI_CMSADM
    You do not need to assign a role and you can use any password.

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.

### 9.3 Exporting and Mounting Directories via NFS

**Related Information**

- Exporting and Mounting Directories via NFS for Linux [page 149]
- Exporting and Mounting Directories via NFS for AIX [page 148]
- Exporting and Mounting Directories via NFS for Oracle Solaris [page 151]
- Exporting and Mounting Directories via NFS for HP-UX [page 149]
9.3.1 Exporting and Mounting Directories via NFS for AIX

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

Context

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

Procedure

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

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

Context

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

Procedure

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

   ```
   share -F nfs -o root=<client_1>:<client_n> access=<client_1>:<client_n> <file system to share>
   
   share -F nfs -o root=hw5111:hw5115, access=hw511:hw5115 /sapmnt/C11/exe
   ```

   If you encounter problems, try using the FQDN (Fully Qualified Domain Name).
   b. To make the file system available to NFS clients, enter the following command:

   ```
   /usr/sbin/shareall
   ```

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

   ```
   hw5115:/sapmnt/C11 /sapmnt/C11 nfs defaults 0 0
   ```
   b. Mount the file system.

   ```
   mount -a
   ```

9.3.3 Exporting and Mounting Directories via NFS for Linux

To export directories via NFS, perform the following steps.

Context

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

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

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

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

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

   Perform the configuration manually.

   To perform the configuration manually, proceed as follows:
   a. To add a line to the local file `/etc/exports`, enter the following:

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

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

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

   **Example**
   - To export the directory `/usr/sap/trans` in read-only mode to the NFS client host `host.wdf.sap-ag.de`, enter the following:
     ```bash
     #/etc/exports
     /usr/sap/trans host.wdf.sap-ag.de(ro)
     ```
To export the directory in read-write mode with root permissions, enter the following:

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

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

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

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

```
exportfs -r
```

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

```
exportfs -v
```

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

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

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

```
mount <nfs_server>::<file_system> <mount_point>
```

Example

```
mount <nfs_server>::/usr/sap/trans /usr/sap/trans
```

9.3.4 Exporting and Mounting Directories via NFS for Oracle Solaris

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

Context

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

Procedure

- On the host on which the directory to be mounted resides:
  a. Enter the following command:

  ```
  /usr/sbin/share
  ```
  
b. To add file systems shared via NFS, edit file `/etc/dfs/dfstab`:
vi /etc/dfs/dfstab

Add the following line for each file system:

share -F nfs -o root=<nfsclient1>:<nfsclient2>,anon=0 -d "description" <file_system_to_be_shared>

i Note

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

Caution

After your SAP system has been installed successfully, in the above line you have to change -o root to -o rw (or remove anon=0, respectively) for all exported directories:

share -F nfs -o rw=<nfsclient1>:<nfsclient2> -d "description" <file_system_to_be_shared>

- On Solaris 9, start the NFS server with the following command:
  /etc/init.d/nfs.server start
- On Solaris 10, start the NFS server with the following command:
  svcadm enable svc:/network/nfs/server:default

To see if the NFS server is active and which partitions are mountable, enter the command:

showmount -e <NFS-server>

On the host on which the additional instance runs:

- If you are mounting NFS disks for the first time, the NFS client software is not active.
  - On Solaris 9, start the NFS server with the following command:
    /etc/init.d/nfs.client start
  - On Solaris 10, start the NFS server with the following command:
    svcadm enable svc:/network/nfs/client:default

- Edit the file /etc/vfstab to mount the directory:

  vi /etc/vfstab

  Add the following line for each file system:

  <host_name_where_directory_resides>:<file_system_to_be_shared> - <mount
  point> nfs - yes -

  If the mount point exists, mount <file_system_to_be_shared> with the command:

  mount <mount point>
9.4 Dialog Instance Installation for an Upgraded System only: Updating Profiles

You only need to perform these steps if you want to install a dialog instance and you have already performed the steps listed under “Prerequisites” in this section.

**Prerequisites**

1. You upgraded your SAP system from an earlier source release as follows:
   - You upgraded your SAP NetWeaver system from an earlier source release to a target release lower than SAP NetWeaver 7.0 SR3.
   - You upgraded your SAP ERP system from an earlier source release to a target release lower than SAP ERP 6.0 SR3.
   - You upgraded your SAP CRM system from an earlier source release to a target release lower than SAP CRM 5.0 SR3.
   - You upgraded your SAP SCM system from an earlier source release to a target release lower than SAP SCM 5.0 SR3.
   - You upgraded your SAP SRM system from an earlier source release to a target release lower than SAP SRM 5.0 SR3.

2. You installed the current Enhancement Package.

**Procedure**

1. On the SAP Global host, go to folder `/<sapmnt>/<SAPSID>/profile`.

   **Note**
   
   SAP system profiles are named as follows:
   
   Instance profiles: `<SAPSID>_<INSTANCE_ID>_<Host_Name>.pfl`
   
   Start profiles: `START_<INSTANCE_ID>_<Host_Name>.pfl`

2. Make sure that the parameter `DIR_CT_RUN`, if set, has identical values in the instance profile and the start profile of the central instance:
   - If it is set in the instance profile, it must also be set in the start profile.
   - If it is not set in the instance profile, it must not be set in the start profile either.

3. Change the default profile `DEFAULT.PFL` by setting `rdisp/msserv_internal` to a free port number.

   **Example**
   
   `DEFAULT.PFL`
   
   **Before the change:**
4. Change the instance profile of the central services instance for Java (SCS instance) as follows:

a. Set \texttt{rdisp/msserv} to 0.

b. Set \texttt{rdisp/msserv\_internal} to the port number assigned to \texttt{rdisp/msserv}.

\begin{itemize}
  \item \textbf{Example}
  \begin{itemize}
    \item \textbf{Before the change:}
    \begin{itemize}
      \item \texttt{rdisp/msserv = 4711}
    \end{itemize}
    \item \textbf{After the change:}
    \begin{itemize}
      \item \texttt{rdisp/msserv = 0}
    \end{itemize}
  \end{itemize}
\end{itemize}

5. Restart all SAP services and instances of your SAP system.

9.5 \textbf{Installation of Additional Usage Types or Software Units in an Existing SAP System}

You can install additional usage types or software units in an \textit{existing} Java system using Software Update Manager (SUM).

The procedure how to do this is described in the documentation \textit{Update of SAP Systems Using Software Update Manager 1.0 SP<Current\_Number>}, which is available at: \url{http://support.sap.com/sitoolset} \textit{System Maintenance} \textit{Software Update Manager (SUM) SP<Current\_Number>} \textit{Guides for SUM 1.0 SP<Current\_Number>}
9.6 Installing the SAP Host Agent Separately

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

Context

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

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

SAP Host Agent has the following executable programs and services:

- The `SAPHostExec` service
- The `sapstartsrv` service `SAPHostControl`
- The operating system collector `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
   
   For more information, see *Hardware and Software Requirements*.

2. Make sure that the `sapadm` user is created.
During the installation, the installer checks all required accounts (users, groups) and services on the local machine. The installer checks whether the required users and groups already exist. If not, it creates new users and groups as necessary.

### Table 44: User and Groups of the SAP Host Agent

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

**Note**

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

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

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

### Table 45: Groups and Members of the SAP Host Agent User

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

3. Set up the required file system for the SAP Host Agent.

### Table 46: Directories

<table>
<thead>
<tr>
<th>Directories</th>
<th>Description</th>
<th>Required Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/usr/sap/hostctrl</code></td>
<td>Contains the following directories:</td>
<td>100 MB</td>
</tr>
<tr>
<td></td>
<td>○ <code>exe</code> Contains the profile <code>host_profile</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ <code>work</code> Working directory of the SAP Host Agent</td>
<td></td>
</tr>
</tbody>
</table>

For more information, see **Setting up file systems and raw devices** [page 56].

4. Make the unpacked Software Provisioning Manager 1.0 archive available on the installation host as described in **Downloading and Extracting the Software Provisioning Manager 1.0 Archive** [page 66].

5. Make the latest patch level of the `SAPHOSTAGENT <Version>.SAR` file available on the host where you want to install the SAP Host Agent.
You can do this in the following ways:

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

- Alternatively, you can also copy it from the UC kernel medium (folder K_<Version>_U_<OS>), where "_U_" means Unicode.
  
  You can either use the physical UC kernel medium from the installation package of your SAP system, or download the kernel medium from https://launchpad.support.sap.com/#/softwarecenter. For more information, see Downloading Installation Media [page 70].

**Recommendation**

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

6. You run the installer [page 83] to install the SAP Host Agent.

   On the **Welcome** screen, choose **<Product> ➤ Software Life-Cycle Options ➤ Additional Preparation Options ➤ Host Agent**.

7. Check whether the installed services are available as follows:

   a. Log on as user sapadm.

   b. Check whether the following services are available:

      - The control program saphostexec
      - The operating system collector saposcol.
      - The SAP NetWeaver Management agent SAPHostControl (sapstartsrv in host mode)

**Note**

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.
Next Steps

For more information about the SAP Host Agent, see SAP Help Portal at:

Table 47:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Help Portal Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>● SAP NetWeaver 7.0</td>
<td><a href="https://help.sap.com/viewer/p/SAP_NETWEAVER">https://help.sap.com/viewer/p/SAP_NETWEAVER</a> &gt; SAP NetWeaver 7.0 &lt;Including Enhancement Package &gt;</td>
</tr>
<tr>
<td>● SAP NetWeaver 7.0 including enhancement package 1</td>
<td>Application Help &gt; SAP NetWeaver by Key Capability &gt; Solution Life Cycle Management by Key Capability &gt; SAP Host Agent</td>
</tr>
<tr>
<td>● SAP NetWeaver 7.0 including enhancement package 3</td>
<td></td>
</tr>
</tbody>
</table>

9.7  Starting and Stopping SAP System Instances

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

- Using the SAP Management Console (SAP MC) [page 158]
- Using commands [page 162].

9.7.1 Starting and Stopping SAP System Instances Using the SAP Management Console

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

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 Management Console, refer to SAP Note 1153713.

For more information about handling the SAP Management Console, see:

Table 48:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Help Portal Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ SAP NetWeaver 7.0</td>
<td>[<a href="https://help.sap.com/viewer/p/SAP_NETWEAVER">https://help.sap.com/viewer/p/SAP_NETWEAVER</a>] (SAP NetWeaver 7.0)</td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.0 including enhancement package 1</td>
<td>[<a href="https://help.sap.com/viewer/p/SAP_NETWEAVER">https://help.sap.com/viewer/p/SAP_NETWEAVER</a>] (SAP NetWeaver 7.0 Including Enhancement Package)</td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.0 including enhancement package 3</td>
<td>[<a href="https://help.sap.com/viewer/p/SAP_NETWEAVER">https://help.sap.com/viewer/p/SAP_NETWEAVER</a>] (SAP NetWeaver 7.0 Including Enhancement Package)</td>
</tr>
</tbody>
</table>

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

Table 49:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Help Portal Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ SAP NetWeaver 7.0</td>
<td></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.0 including enhancement package 1</td>
<td></td>
</tr>
<tr>
<td>○ SAP NetWeaver 7.0 including enhancement package 2</td>
<td></td>
</tr>
<tr>
<td><strong>SAP NetWeaver 7.0 including enhancement package 3</strong></td>
<td></td>
</tr>
</tbody>
</table>

| | https://help.sap.com/viewer/p/SAP_NETWEAVER_703 |
| | Application Help > SAP NetWeaver by Key Capability > Solution Life Cycle Management by Key Capability > Solution Monitoring > Monitoring in the CCMS > SAP Microsoft Management Console: Windows |

### Procedure

- **Starting the Web-Based SAP Management Console**

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

     \[
     \text{http://<Host_Name>:5<Instance_Number>13}
     \]

     **Example**

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

     \[
     \text{http://saphost06:55313}
     \]

     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.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>The system might prompt you for the credentials of the SAP system administrator. To complete the operation, you require administration permissions. Log in as user &lt;sapsid&gt;adm.</td>
</tr>
</tbody>
</table>

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 central instance JC<Instance_Number>.
4. Start dialog 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.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>The system might prompt you for the SAP system administrator credentials. To complete the operation, you require administration permissions. Log in as user &lt;sapsid&gt;adm.</td>
</tr>
</tbody>
</table>

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 dialog instances J<Instance_Number>, if there are any.
2. Stop the central instance JC<Instance_Number>.
3. Stop the central services instance SCS<Instance_Number>.
4. Stop the database instance.
9.7.2 Starting and Stopping SAP System Instances Using Commands

Prerequisites

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

Context

Note

The startsap and stopsap commands are deprecated. SAP recommends that you do not use them any longer. For more information, see SAP Notes 1763593 and 809477.

This section only lists the basic commands how to start or stop an SAP system. You can find a detailed list of all SAPControl options and features in the command line help, which you can call as follows:

/usr/sap/hostctrl/exe/sapcontrol --help

Procedure

- Starting an SAP System or Instance
  - Starting an SAP System:
    You can start an SAP system by executing the following commands from the command line (<Instance_Number> can be the number of any instance of the SAP system):
    /usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -function StartSystem
  - Starting an SAP System Instance
    You can start an SAP system instance by executing the following commands from the command line:
    /usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -function Start
    For remote instances, the syntax is slightly different, because you also have to apply the -host and -user parameters:
    /usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -host <remote host> -user <sapsid>adm <password> -function Start

- Stopping an SAP System or Instance
  - Stopping an SAP System
    You can stop an SAP system by executing the following commands from the command line (<Instance_Number> can be the number of any instance of the SAP system):
    /usr/sap/hostctrl/exe/sapcontrol -nr <instance_number> -function StopSystem
  - Stopping an SAP System Instance
You can stop an SAP system instance by executing the following commands from the command line:

```bash
/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:

```bash
/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 databasespecific 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):
    ```bash
    /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:
    ```bash
    /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.

### 9.8 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 *Preparing the Active Directory* in the Windows installation guide for your SAP system solution and database.
Procedure

1. Log on as user <sapsid>adm.
2. Enter:
   \texttt{ldappasswd pf=<Path\_and\_Name\_of\_Instance\_Profile>}
3. Enter the required data.

The following is an example of an entry to create an \textit{LDAP Directory User}:

\texttt{CN=sapldap,CN=Users,DC=nt5,DC=sap-ag,DC=de}

9.9 Usage Type-Specific Initial Technical Configuration Done by the Installer

The installer automatically performs initial technical configuration steps for the usage types shown below during the installation. However, you might have to perform these steps manually if you want to change existing parameters or you want to set additional parameters.

For more information, see the following usage type-specific sections.

Related Information

Initial Technical Configuration for SAP NetWeaver Application Server for Java (AS Java) [page 164]
Initial Technical Configuration for Development Infrastructure (DI) [page 167]
Initial Technical Configuration for the Portal (Usage Types EPC and EP) [page 169]
Initial Technical Configuration for BI Java [page 170]

9.9.1 Initial Technical Configuration for SAP NetWeaver Application Server for Java (AS Java)

The installer automatically performs initial technical configuration steps for some components of SAP NetWeaver Application Server for Java (AS Java). However, you might have to perform some of these steps manually after the installer has finished, depending on your installation scenario.

These are the following components.

Related Information
9.9.1.1 Initial Technical Configuration for Adobe Document Services

The installer automatically performs some initial technical configuration steps for Adobe Document Services (ADS) during the installation. However, you might have to perform these steps manually if you want to change existing parameters or if you want to set additional parameters.

The installer performs the following steps:

- The installer creates user ADSUser in AS Java for basic authentication and assigns it to group ADSCallers.
  
  For more information about this user, see Ensuring User Security [page 107].

- The installer sets up basic authentication in the Java environment.

More Information

For more information about how to perform these steps manually, see SAP Help Portal at the following locations:

Table 59:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Help Portal Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.0</td>
<td><a href="https://help.sap.com/viewer/p/SAP_NETWEAVER">https://help.sap.com/viewer/p/SAP_NETWEAVER</a></td>
</tr>
<tr>
<td>SAP NetWeaver 7.0 including enhancement package 1</td>
<td>SAP NetWeaver by Key Capability</td>
</tr>
<tr>
<td>SAP NetWeaver 7.0 including enhancement package 2</td>
<td>Configuration and Deployment Information</td>
</tr>
<tr>
<td></td>
<td>Consultant's Guide: English</td>
</tr>
<tr>
<td></td>
<td>Business Task Management</td>
</tr>
<tr>
<td></td>
<td>Adobe Document Services (Configuration)</td>
</tr>
<tr>
<td></td>
<td>Configuring the Web Service</td>
</tr>
<tr>
<td></td>
<td>Securing Access to the Web Service</td>
</tr>
<tr>
<td></td>
<td>Configuration of the Web Service for Basic Authentication</td>
</tr>
</tbody>
</table>
The installer automatically performs some initial technical configuration steps for Composite Application Framework Core (CAF) during the installation. However, you might have to perform these steps manually if you want to change existing parameters or if you want to set additional parameters.

The installer performs the following steps:

- The installer creates the following roles with the required User Management Engine (UME) actions:
  - CAFAdmin
  - CAFUIAdmin
  For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for SAP NetWeaver Business Warehouse (BW) integration. For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for knowledge management integration. For more information about how to perform this step manually, see SAP Help Portal at:

9.9.1.2 Initial Technical Configuration for Composite Application Framework Core (CAF)

The installer automatically performs some initial technical configuration steps for Composite Application Framework Core (CAF) during the installation. However, you might have to perform these steps manually if you want to change existing parameters or if you want to set additional parameters.

The installer performs the following steps:

- The installer creates the following roles with the required User Management Engine (UME) actions:
  - CAFAdmin
  - CAFUIAdmin
  For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for SAP NetWeaver Business Warehouse (BW) integration. For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for knowledge management integration. For more information about how to perform this step manually, see SAP Help Portal at:

The installer performs the following steps:

- The installer creates the following roles with the required User Management Engine (UME) actions:
  - CAFAdmin
  - CAFUIAdmin
  For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for SAP NetWeaver Business Warehouse (BW) integration. For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for knowledge management integration. For more information about how to perform this step manually, see SAP Help Portal at:

The installer performs the following steps:

- The installer creates the following roles with the required User Management Engine (UME) actions:
  - CAFAdmin
  - CAFUIAdmin
  For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for SAP NetWeaver Business Warehouse (BW) integration. For more information about how to perform this step manually, see SAP Help Portal at:
- The installer configures CAF runtime properties for knowledge management integration. For more information about how to perform this step manually, see SAP Help Portal at:
The installer creates data sources to extract custom enumeration types. For more information about how to perform this step manually, see SAP Help Portal at:

http://help.sap.com/nw

Development ➔ SAP NetWeaver Developer’s Guide ➔ Fundamentals ➔ Creating Composite Applications ➔ Developing Composite Applications with CAF Core ➔ Integration ➔ CAF Core and SAP Business Information Warehouse Integration ➔ DataSource Use in CAF and SAP BW Integration ➔ DataSources to Extract Custom Enumeration Types

9.9.1.3 Initial Technical Configuration for the System Landscape Directory (SLD)

The installer automatically performs some initial technical configuration steps for the System Landscape Directory (SLD) during the installation. However, you might have to perform these steps manually if you want to change existing parameters or if you want to set additional parameters.

- If you choose option Register in existing central SLD, the installer automatically configures the connection of the system being installed to an existing central SLD. For more information about how to perform these steps manually, see:

  https://help.sap.com/viewer/p/SAP_NETWEAVER

  SAP NetWeaver 7.0 ➔ Application Help ➔ SAP NetWeaver by Key Capability ➔ Solution Life Cycle Management by Key Capability ➔ Software Life Cycle Management ➔ System Landscape Directory ➔ Configuring Systems to Connect to SLD

- If you choose option Configure a local SLD, the installer automatically sets up and configures a local SLD during the installation. For more information about how to perform these steps manually, see the documentation Post Installation Guide – System Landscape Directory of SAP NetWeaver 7.0 which you can find on the System Landscape Directory (SLD) - Overview page at https://wiki.scn.sap.com/wiki/display/SL/System+Landscape+Directory+%28SLD%29+-+Overview.

9.9.2 Initial Technical Configuration for Development Infrastructure (DI)

The installer automatically performs some initial technical configuration steps for usage type Development Infrastructure (DI) during the installation. However, you might have to perform these steps manually if you want to change existing parameters or you want to set additional parameters.

The installer performs the following steps:

- The installer creates the following NWDI users:
  - NWDI_ADM
  - NWDI_DEV
  - NWDI_CMSADM

For more information about these NWDI users, see the table in Users in the SAP NetWeaver Development Infrastructure (NWDI) of Ensuring User Security [page 107].
The installer creates the following roles:
- NWDI.Administrator
- NWDI.Developer

The installer adds the following actions to the role NWDI.Administrator:
- CBS.Administrator
- sap.com_com.sap.lcr.LcrInstanceWriterAll

The installer adds the following actions to the role NWDI.DEVELOPER:
- CBS.Developer
- CMS.Display
- CMS.ExportOwn
- sap.com_com.sap.lcr.LcrInstanceWriterNR

The installer creates the following groups:
- NWDI.Administrators
- NWDI.Developers

The installer assigns the security role LcrInstanceWriterAll of the component sap.com/com.sap.lcr'sid to the group NWDI.Administrators.

The installer assigns the security role LcrInstanceWriterNR of the component sap.com/com.sap.lcr'sid to the group NWDI.Developers.

The installer assigns the role NWDI.Administrator to the group NWDI.Administrators.

The installer assigns the role NWDI.Developer to the group NWDI.Developers.

The installer assigns the group NWDI.Administrators to the user NWDI_ADM.

The installer assigns the group NWDI.Developers to the user NWDI_DEV.

The installer assigns the group NWDI.Administrators to the user NWDI_CMSADM.

More Information

For more information about how to perform these steps manually, see SAP Help Portal at:


9.9.3 Initial Technical Configuration for the Portal (Usage Types EPC and EP)

This section applies when you install usage type EPC only and when you install it together with usage type EP. The installer automatically performs some initial technical configuration steps for the usage types EPC and EP during the installation. However, you might have to perform these steps manually if you want to change existing parameters or you want to set additional parameters.

Context

The installer performs the following steps:

- The installer copies the CMS_MAPPING Properties file.
- The installer renames the InitialPermissions.xml.template file to initialPermissions.xml.
- The installer renames the initialPermissionsKMC.xml.template file to initialPermissionsKMC.xml.

Procedure

- **Copying CMS_MAPPING properties**
  a. Change to the following source directory:

     `/usr/sap/<sapsid>/<Instance_Name>/j2ee/cluster/server<x>/apps/sap.com/irj/servlet_jsp/irj/root/WEB-INF/portal/system/pcd/Migration/mapping/`

  b. Copy file `cms_mapping.properties` from the source directory to the following target directory:

     `/usr/sap/<sapsid>/SYS/global/pcd/Migration/mapping/`.

     \* Note

     If the target directory does not exist, you also have to create it.

- **Renaming InitialPermissions.xml.template**
  a. Go to the following directory:

     `/usr/sap/<sapsid>/<Instance_Name>/j2ee/cluster/server<x>/apps/sap.com/irj/servlet_jsp/irj/root/WEB-INF/portal/system/xml/acl`

  b. Rename file `initialPermissions.xml.template` to `initialPermissions.xml`.

- **Renaming initialPermissionsKMC.xml.template**
  a. Go to the following directory:

     `/usr/sap/<sapsid>/<Instance_Name>/j2ee/cluster/server<x>/apps/sap.com/irj/servlet_jsp/irj/root/WEB-INF/portal/system/xml/acl`

  b. Rename file `initialPermissionsKMC.xml.template` to `initialPermissionsKMC.xml`. 
9.9.4 Initial Technical Configuration for BI Java

The installer automatically performs BI Java-specific initial technical configuration steps during the installation. However, you might have to perform these steps manually if you want to change existing parameters or you want to set additional parameters.

The following steps might be affected.

Related Information

Configuring BI Java Information Broadcasting [page 170]
Process Chains: Transporting Texts for the Alert Category [page 171]
Renaming initialPermissionsBI.xml.template [page 172]

9.9.4.1 Configuring BI Java Information Broadcasting

The installer automatically configures BI Java information broadcasting. However, you might have to perform some of these steps manually if you upgraded your SAP system to the current release. The following steps might be required.

Context

For the configuration of the BI Information Broadcasting you need to perform the following steps in your ABAP system:

Procedure

1. Call transaction SPRO and perform the following steps:
   a. **Settings for Information Broadcasting:**
      - Go to [SAP NetWeaver] ➔ [Business Intelligence] ➔ [Reporting-relevant Settings] ➔ [Settings for Information Broadcasting].
   b. **Destinations for Web Dynpro ALV:**
      - Go to [SAP NetWeaver] ➔ [Application Server] ➔ [Web Dynpro for ABAP] ➔ [Set-Up Printing for Web Dynpro ABAP ALV].
      - Create the RFC destination in the SAP NetWeaver Portal
      - Create the RFC destination to the SAP NetWeaver Portal
2. Installation of BI Content:

Call transaction RSTCO_ADMIN to check whether the installation has been performed successfully. If the installation status is red, restart the installation by calling transaction RSTCO_ADMIN again. If you need further assistance or information, check the installation log.

For more information, see SAP Note 834280.

For the installation of SAP NetWeaver 7.0 BI Content Add-On 2 or higher on the AS ABAP system, see SAP Note 847019.

9.9.4.2 Process Chains: Transporting Texts for the Alert Category

Alert categories need to be defined.

Context

Alerts can be triggered and sent for BI process chains that contain errors. For this purpose, you need to define alert categories. Alert category BWAC_PROCESS_CHAIN_FRAMEWORK is returned for errors in background processing of process chains. This category has set texts that are not transported when the alert category is transported.

Procedure

To manually transport the texts, proceed as described in SAP Note 601619.
9.9.4.3 Renaming initialPermissionsBI.xml.template

If the installer does not automatically rename the initialPermissionsBI.xml.template file, you need to rename it yourself.

Procedure

1. Go to the following directory:
   
   ```
   ```
2. Rename file `initialPermissionsBI.xml.template` to `initialPermissionsBI.xml`.

9.10 Heterogeneous SAP System Installation

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

See SAP Note 1067221 for more information on:

- Supported combinations of operating systems and database systems
- How to install an application server on Windows in a heterogeneous (UNIX) SAP system environment
- Heterogeneous SAP system landscapes with different UNIX operating systems (see also Exporting and Mounting Global Directories: Distributed and High-Availability Systems [page 77])

9.11 Verifying and Adjusting the instanceID of an AS Java Instance

Using option `Adjust instanceID of an AS Java Instance` in Software Provisioning Manager (the “installer” for short), you can verify the correctness of the `instanceID` and `box number` parameters of an existing AS Java instance, and adjust them if required.

Prerequisites

- The AS Java instance can be started.
- **Caution:** The installer performs changes in the database which are related to J2EE Engine configuration. Therefore it is recommended that you back up the J2EE Engine configuration using the ConfigTool. You
can do this by exporting configurations cluster_data, HttpHosts, apps, jms_provider, and WebContainer using OfflineConfigEditor and configuration of `<SAPSID>/Server <xxx>/Services/Key Storage` using the Visual Administrator.

**Context**

**When to Use Option Adjust instanceID of an AS Java Instance**

- **Software Update Manager (SUM) fails due to incorrect parameter instanceID.**
  
  **Example**
  
  An error like the following occurs during the upgrade of a Java system based on SAP NetWeaver 7.0x:
  
  The detected instance ID IDXXXXX and the one calculated from the box number IDXXXX do not match. A possible reason for this could be that you have changed the box number in the central instance instance.properties file.
  
- **The installer (70SWPM*.SAR) fails due to incorrect parameter instanceID.**
  
  **Example**
  
  An error like the following occurs during system copy, dual-stack split, or system rename of a Java system based on SAP NetWeaver 7.0x with Software Provisioning Manager:
  
  The source or target cluster ID is not present on the system! The current (source) cluster ID is XXXXX and the new (target) cluster ID is XXXXX
  
- **You are in doubt about consistency or correctness of the instanceID parameter of an AS Java instance.**

**Background Information About How Adjust instanceID of an AS Java Instance Works**

Software logistics tools (Software Provisioning Manager (the "installer"), Software Update Manager) verify if the instanceID parameter corresponds to the box number of an SAP system based on SAP NetWeaver AS for Java. If the instanceID parameter is not consistent, Software Provisioning Manager fails.

The Box number has the format `<SAPSID><instance_name><host_name>` and is used as a parameter for the instanceID generation. instanceID is a unique identifier generated for each instance and is stored in the SAP system database schema when creating a new Java system. An inconsistency between instanceID and box number is caused by applying an unsupported procedure to create or maintain the system. Using Software Provisioning Manager for system copy or system rename (changing the `<SAPSID>`, host name, or instance name) guarantees consistency.

*Adjust instanceID of an AS Java Instance* changes the box number and instanceID in the database and synchronizes the instance.properties file.

**More Information**

For more information, such as troubleshooting and FAQ, see SAP Note [2259748](https://support.sap.com).
**Procedure**

1. Stop the AS Java instance or dual-stack instance and make sure that the database is running.
2. Start the installer and choose option *Adjust instanceID of an AS Java Instance* from the following path in the *Welcome* screen:

   ```
   Caution
   If the AS Java instance uses a virtual host name, start the installer with the installer property SAPINST_USE_HOSTNAME as follows:
   ```
   ```
   ./sapinst SAPINST_USE_HOSTNAME=<Virtual_Host_Name>
   ```

3. Follow the instructions given on the screens.

**Next Steps**

Perform the following activities after applying the correction:

1. Calculate the box number using the SAPLOCALHOST profile parameter in lower case.
2. Calculate the correct instanceID using the tool attached to SAP Note 1987497.
3. Adjust the `/usr/sap/<SAPSID>/j2ee/cluster/bootstrap/bootstrap.properties` file: Assign the instance.prefix property to the correct instanceID.
4. Examine the instance profile - if `j2ee/instance_id` exists, change it to the new instanceID.
5. Open the OfflineConfigEditor and expand `cluster_data` if the `performerID` property exists, change it to the new instanceID.
6. If you have **EP: Knowledge Management and Collaboration** installed on your system, you have to do the following adjustments for the *Scheduler Service*:
   Assign scheduler tasks to the new system IDs of the target system. This is required because after applying the correction, tasks are still assigned to the IDs of the source system.
   For more information, see SAP Help Portal at:
   ```
   Table 60:
<table>
<thead>
<tr>
<th>Release</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.0:</td>
<td><a href="https://help.sap.com/viewer/p/SAP_NETWEAVER">https://help.sap.com/viewer/p/SAP_NETWEAVER</a></td>
</tr>
<tr>
<td>SAP NetWeaver 7.0 including EHP1:</td>
<td>SAP NetWeaver 7.0 &lt;Including Enhancement Package&gt;</td>
</tr>
<tr>
<td>SAP NetWeaver 7.0 including EHP2:</td>
<td>Application Help &gt; SAP NetWeaver by Key</td>
</tr>
<tr>
<td>SAP NetWeaver 7.0 including EHP3:</td>
<td>Knowledge Management &gt; Administration Guide &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>Minimal Configuration for Knowledge Management &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>Cluster Only: Assigning Tasks to Nodes &gt;&gt;</td>
</tr>
</tbody>
</table>
9.12 Troubleshooting for Portal Installation

This section applies both when you install usage type EPC only and when you install it together with usage type EP.

Context

If the iViews are not displayed correctly, or if the portal does not launch, the reason might be that the portal was not deployed completely.

To check the deployment of the portal, proceed as follows:

Procedure

1. Open a new console with the user `<sapsid>adm`.
2. Go to the directories `deployment`, `pcd`, and `pcdContent`, in the following paths:
   - `/usr/sap/<SAPSID>/JC<Instance_Number>/j2ee/cluster/server0/apps/sap.com/irj/servlet_jsp/irj/root/WEB-INF/deployment`
   - `/usr/sap/<SAPSID>/JC<Instance_Number>/j2ee/cluster/server0/apps/sap.com/irj/servlet_jsp/irj/root/WEB-INF/deployment/pcd`
   - `/usr/sap/<SAPSID>/JC<Instance_Number>/j2ee/cluster/server0/apps/sap.com/irj/servlet_jsp/irj/root/WEB-INF/deployment/pcdContent`
   - `/usr/sap/<SAPSID>/JC<Instance_Number>/j2ee/cluster/server0/apps/sap.com/irj/servlet_jsp/irj/root/WEB-INF/deployment/pcdContent/no_overwrite`
   - `<Drive>:\usr\sap\<SAPSID>\JC<Instance_Number>\j2ee\cluster\server0\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\deployment`
   - `<Drive>:\usr\sap\<SAPSID>\JC<Instance_Number>\j2ee\cluster\server0\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\deployment\pcd`
   - `<Drive>:\usr\sap\<SAPSID>\JC<Instance_Number>\j2ee\cluster\server0\apps\sap.com\irj\servlet_jsp\irj\root\WEB-INF\deployment\pcdContent`
   - `<Drive>:\usr\sap\<SAPSID>\<Instance_Number>\j2ee\cluster\server0`
3. Look for files with the extension *.err.

4. Do one of the following:
   - If error and log files do not appear, the portal installation has been completed successfully and you can continue.
   - Rename the *.err files:
     1. Remove the err extension; so the extensions of the files become *.ept or *.par.
     2. Restart the Java Engine, using the commands `stopsap` and `startsap`, to change the files to *.bak.

## 9.13 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. If there is a lock on one of the SAP system objects, the uninstall fails. Make also sure that all SAP-related processes are stopped.

⚠️ **Note**

You do not have to stop the SAP Host Agent. The SAP Host Agent is stopped automatically during the uninstall process.
• Make sure that there are no open sessions by one of the SAP system users when starting the uninstall.

Context

Note the following when deleting an SAP system:
• We strongly recommend that you delete an SAP system using the installer. To delete an SAP system manually, proceed as described in SAP Note 1229586.
• You cannot delete an SAP system remotely.
• The installer deletes the database instance and optionally the database software.
• 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 in 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 83].
2. On the Welcome screen, choose: [Product] > Software Life-Cycle Options > Uninstall > Uninstall > System / Standalone Engine / Optional Standalone Unit
3. Follow the instructions in the installer input dialogs to delete a complete SAP system or single instances.

<table>
<thead>
<tr>
<th>Deletion of</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central system</td>
<td>You can delete a central system (where all instances reside on the same host), in one installer run.</td>
</tr>
</tbody>
</table>

The following table provides information about deleting a complete system or single instances with the installer.
### Deletion of Distributed or High-Availability System

- **Remarks:** If you want to delete a distributed or high-availability system, you have to run the installer to delete the required instances locally on each of the hosts belonging to the SAP system in the following sequence:
  1. Dialog instances, if there are any
  2. Central instance
  3. Database instance
  4. Enqueue Replication Server
  5. Central services instance (SCS)

#### Caution

*Do not* select checkbox *Uninstall all instances of the SAP system from this host* 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 a dialog instance of an existing SAP system distributed over several hosts. Otherwise the contents of mounted global directories under `/<sapmnt>/<SAPSID>/`, such as instance profiles and kernel executables, are also deleted.

#### Note

To delete system directories mounted from an NFS server, you have to run the installer on the NFS server.

### Deletion of Dialog Instance

- **Remarks:** If you want to delete dialog instances of an existing SAP system, you have to run the installer to delete them locally on each dialog instance host.

### Deletion of Standalone SAP Host Agent

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

If you want to uninstall a standalone SAP Host Agent, deselect *Profiles Available* and select *Uninstall Standalone SAP Host Agent* on the *General SAP System Parameters* screen.

---

4. When you have finished, delete the relevant directory structure on the global host.
5. If required, you can delete the directory `/usr/sap/trans` and its content manually.

The installer does not delete `/usr/sap/trans` because it might be shared.

6. If you created the directories `/usr/sap/<SAPSID>` and `/<sapmnt>/<SAPSID>` as mount points, but not as directories on the local file system, you have to remove them manually.

A Appendix

A.1 Online Information for SAP Applications on SAP Adaptive Server Enterprise

More information is available online as follows.

Table 62: General Quick Links

<table>
<thead>
<tr>
<th>Description</th>
<th>Internet Address</th>
</tr>
</thead>
</table>
Important Disclaimers and Legal Information

Coding Samples

Any software coding and/or code lines / strings ("Code") included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended to better explain and visualize the syntax and phrasing rules of certain coding. SAP does not warrant the correctness and completeness of the Code given herein, and SAP shall not be liable for errors or damages caused by the usage of the Code, unless damages were caused by SAP intentionally or by SAP's gross negligence.

Gender-Neutral Language

As far as possible, SAP documentation is gender neutral. Depending on the context, the reader is addressed directly with "you", or a gender-neutral noun (such as "sales person" or "working days") is used. If when referring to members of both sexes, however, the third-person singular cannot be avoided or a gender-neutral noun does not exist, SAP reserves the right to use the masculine form of the noun and pronoun. This is to ensure that the documentation remains comprehensible.

Internet Hyperlinks

The SAP documentation may contain hyperlinks to the Internet. These hyperlinks are intended to serve as a hint about where to find related information. SAP does not warrant the availability and correctness of this related information or the ability of this information to serve a particular purpose. SAP shall not be liable for any damages caused by the use of related information unless damages have been caused by SAP's gross negligence or willful misconduct. All links are categorized for transparency (see: https://help.sap.com/viewer/disclaimer).