Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3 EHP1 to 7.52 on Windows: SAP HANA Database
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- New Features:
  - New Software Provisioning Manager Option Download Media for a Maintenance Plan, documented in: New Features, Downloading the Media for a Maintenance Planner Transaction
  - Validity Check for SUM*.SAR Archive, documented in: New Features, Additional Parameters When Using a Stack XML File
  - Information “enqueue server” versus “enqueue server 2”, “enqueue replication server” versus “enqueue replication server 2” added: High Availability with Microsoft Failover Clustering, System Based on SAP NetWeaver AS for ABAP 7.52 only: Switching to Enqueue Server 2 and Enqueue Replication Server 2
  - Post-installation section Systems Based on SAP NetWeaver AS for ABAP 7.52 Only: Run Software Provisioning Manager Option “Check and Adjust ABAP System” added
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<td>• Digital signature check for installation archives, documented in: New Features, Downloading SAP Kernel Archives (Archive-Based Installation) Archive-Based Installation for Diagnostics Agent, Downloading the SAP Kernel Archives Required for the Dual-Stack Split (Without Operating System and Database Migration), Downloading the SAP Kernel Archives Required for Operating System and Database Migration</td>
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<td>• Software provisioning manager Log Files Improvements, documented in: New Features, Useful Information about the Software Provisioning Manager, Troubleshooting with the Software Provisioning Manager</td>
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<td>• Secure ABAP message server connection, documented in: New Features, SAP System Parameters</td>
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<td>• Enabling IPv6, documented in: New Features, Prerequisites for Running the Software Provisioning Manager</td>
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<td>• New Features section restructured: As of SP22, a dedicated subsection for each new SP has been created. New features below SP22 remain in a common table.</td>
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<td>• The Java SDT GUI - which was in the SP21 version still available in parallel to the SL-UI - has been deprecated with SP22. As of SP22, SL-UI is the only available GUI of the software provisioning manager:</td>
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<td>• The following sections which were explicitly related to Java SDT GUI were completely removed from this documentation: Performing a Remote Installation Remote Processing of the Software Provisioning Manager (Java SDT GUI only), Starting the Java SDT GUI Separately, Running the Software Provisioning Manager in Accessibility Mode (general accessibility information was moved to Useful Information About the Software Provisioning Manager).</td>
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<td>• The Java SDT GUI-specific information was removed from the common software provisioning manager sections: Running the Software Provisioning Manager, Useful Information About the Software Provisioning Manager, Interrupted Processing of the Software Provisioning Manager, Troubleshooting with the Software Provisioning Manager, Deleting an SAP System or Single Instances</td>
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<td>• New section Using the Step State Editor (SAP Support Experts Only) was added to section Additional Information About the Software Provisioning Manager</td>
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2.8 2017-09-11  Updated version for software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)

- New Features:
  - Media Signature Check, documented in: New Features, Running the Software Provisioning Manager, Preparing the Installation Media. This feature implies that section Creating Kernel Archives from an Existing SAP System has been deleted from this documentation because the related option in the software provisioning manager had to be removed.
  - Download Media for a Maintenance Plan, documented in: New Features, Downloading Media for a Maintenance Plan
  - SAP Host Agent Upgrade, documented in: New Features, SAP System Parameters, Downloading SAP Kernel Archives (Archive-Based Installation)
  - Load tools are now available as LOADTOOLS.SAR in the Software Provisioning Manager archive, documented in: New Features, Downloading and Extracting the Software Provisioning Manager Archive
  - Simplified additional application server instance installation, documented in: New Features, Preparing the Installation Media, Downloading SAP Kernel Archives (Archive-Based Installation)

2.7 2017-05-22  Updated version for software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)

- New Features:
  - New SAPUI5-based graphical user interface (GUI) “SL-UI”, documented in: Prerequisites for Running the Software Provisioning Manager, Running the Software Provisioning Manager, Useful Information About the Software Provisioning Manager
  - Option for choosing to install an embedded gateway during the ASCS instance installation, documented in: Installation Options Covered by this Guide, SAP System Parameters, Parameters for Additional Components to be Included in the ASCS Instance, Post-Installation Checklist, SAP Gateway Configuration

2.6 2017-02-07  Updated version for software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19):

- New Features:
  - Verification of the integrity of data units in Software Provisioning Manager, documented in: New Features, Downloading the Software Provisioning Manager Archive
  - Archive-based Language Installation, documented in: Additional Parameters When Using a Stack XML File
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<td>• Preparing the Installation Media [page 80]</td>
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1 About this Document

This installation guide describes how to install an SAP system based on the application server ABAP of SAP NetWeaver 7.3 EHP1 to 7.52 using the installation tool software provisioning manager 1.0 SP39, which is part of SL Toolset 1.0 SP39.

This guide covers the SAP system products and releases listed in SAP Products Based on SAP NetWeaver 7.3 EHP1 to 7.52 Supported for Installation Using Software Provisioning Manager 1.0 [page 13].

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

For information about maintenance of SAP Business Suite and corresponding SAP NetWeaver versions, see SAP Note 1648480.

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

Caution
Make sure you have read Before You Start [page 18] before you continue with this installation guide.

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

For SAP SCM only: If you want to use SAP liveCache on SAP HANA, you must install the LCPPS package on the database server. For more information, see the SAP MaxDB Administration Guide at https://help.sap.com/maxdb.

SAP Products Based on SAP NetWeaver 7.3 EHP1 to 7.52 Supported for Installation Using Software Provisioning Manager 1.0 [page 13]

Here you can find a list of the SAP products based on SAP NetWeaver 7.3 EHP1 to 7.52 ABAP that are supported for installation using Software Provisioning Manager 1.0, on the specific operating system and database combination described in this guide.

Naming Conventions [page 15]
This section lists the naming conventions that are currently apply for the software provisioning manager 1.0 and terms used in this documentation.

Constraints [page 16]
This section lists the naming constraints that are currently valid for the software provisioning manager 1.0 and this documentation.
1.1 SAP Products Based on SAP NetWeaver 7.3 EHP1 to 7.52 Supported for Installation Using Software Provisioning Manager 1.0

Here you can find a list of the SAP products based on SAP NetWeaver 7.3 EHP1 to 7.52 ABAP that are supported for installation using Software Provisioning Manager 1.0, on the specific operating system and database combination described in this guide.

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<tr>
<td>foundation 1709 on SAP NetWeaver Application Server for ABAP 7.52, version for SAP HANA</td>
<td>SAP NetWeaver AS for ABAP 7.52</td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td>SAP NetWeaver AS for ABAP 7.52</td>
</tr>
<tr>
<td>SAP S/4HANA 1610 (Out of Maintenance since December 2021):</td>
<td>SAP NetWeaver AS for ABAP 7.51 innovation package</td>
</tr>
<tr>
<td>• SAP S/4HANA Server</td>
<td></td>
</tr>
<tr>
<td>• AS ABAP for SAP S/4HANA Frontend</td>
<td></td>
</tr>
</tbody>
</table>

⚠️ Caution

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>SAP NetWeaver AS for ABAP 7.51 innovation package</td>
<td>SAP NetWeaver AS for ABAP 7.51 innovation package</td>
</tr>
<tr>
<td>SAP Product</td>
<td>Based on the following SAP NetWeaver Release</td>
</tr>
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<td>-----------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>⚠️ Caution</strong></td>
<td></td>
</tr>
<tr>
<td>The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note 3220901)</td>
<td></td>
</tr>
<tr>
<td>• SAP S/4HANA Server</td>
<td></td>
</tr>
<tr>
<td>• AS ABAP for SAP S/4HANA Frontend</td>
<td></td>
</tr>
<tr>
<td>SAP S/4HANA on-premise edition 1511 Support Release 1 (Out of Maintenance since December 2020)</td>
<td>SAP NetWeaver 7.5</td>
</tr>
<tr>
<td><strong>⚠️ Caution</strong></td>
<td></td>
</tr>
<tr>
<td>The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note 3220901)</td>
<td></td>
</tr>
<tr>
<td>SAP Business Suite 7i 2016:</td>
<td></td>
</tr>
<tr>
<td>• EHP4 for SAP CRM 7.0 ABAP</td>
<td>SAP NetWeaver 7.5</td>
</tr>
<tr>
<td>• EHP8 for SAP ERP 6.0 ABAP</td>
<td>SAP NetWeaver 7.4 Support Release 2</td>
</tr>
<tr>
<td>• EHP8 for SAP ERP 6.0 ABAP including SAP S/4HANA Finance 1605 SP03</td>
<td>SAP NetWeaver 7.3 EHP1</td>
</tr>
<tr>
<td>• EHP4 for SAP SRM 7.0 ABAP</td>
<td></td>
</tr>
<tr>
<td>• EHP4 for SAP SCM 7.0 ABAP</td>
<td></td>
</tr>
<tr>
<td>SAP BW/4HANA 1.0 (Out of Maintenance since December 2021)</td>
<td>SAP NetWeaver 7.5</td>
</tr>
<tr>
<td><strong>⚠️ Caution</strong></td>
<td></td>
</tr>
<tr>
<td>The options for this product have been removed from software provisioning manager 1.0 as of SP37. These options are still available in the “frozen” software provisioning manager 1.0 SP35 (see SAP Note 3220901)</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.4 Support Release 2</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 EHP1</td>
<td></td>
</tr>
</tbody>
</table>
SAP Product | Based on the following SAP NetWeaver Release
---|---
SAP Business Suite 7i 2013 Support Release 2: | SAP NetWeaver 7.5
  • EHP3 for SAP CRM 7.0 ABAP Support Release 2 | SAP NetWeaver 7.4 Support Release 2
  • EHP7 for SAP ERP 6.0 ABAP Support Release 2 | SAP NetWeaver 7.3 EHP1
  • EHP7 for SAP ERP 6.0 ABAP including SAP Simple Finance 1.0 / 1503 | 
  • EHP3 for SAP SRM 7.0 ABAP Support Release 2 | 
  • EHP3 for SAP SCM 7.0 ABAP Support Release 2 | 
SAP NetWeaver 7.5 | SAP NetWeaver 7.5
SAP Solution Manager 7.2 Support Release 2 | SAP NetWeaver 7.4 Support Release 2
AS ABAP 7.4, OEM version 1.0 | SAP NetWeaver 7.4 Support Release 2
SAP NetWeaver 7.4 Support Release 2 | SAP NetWeaver 7.4
SAP Business Suite, powered by SAP HANA (Out of Maintenance since December 2020): | SAP NetWeaver 7.3 EHP1
  • EHP2 for SAP CRM 7.0 On SAP HANA | 
  • EHP6 for SAP ERP 6.0 On SAP HANA | 
  • EHP2 for SAP SCM 7.0 On SAP HANA | 

1.2 Naming Conventions

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

- The software provisioning manager 1.0 is the successor of the product- and release-specific delivery of provisioning tools, such as “SAPinst”.

Before you perform an installation from scratch or a target system installation in the context of a system copy, we strongly recommend that you always download the latest version of the software provisioning manager 1.0 which is part of the Software Logistics Toolset 1.0 (“SL Toolset” for short). For more information, see Preparing the Installation Media [page 80].

This way, you automatically get the latest version with the latest fixes of the tool and supported processes. For more information about the software provisioning manager 1.0 as well as products and releases supported by it, see SAP Note 1680045 and https://wiki.scn.sap.com/wiki/display/SL/Software+Provisioning+Manager+1.0+and+2.0.
The “SAPinst” tool has been renamed to “software provisioning manager”, but the terms “SAPinst” and “sapinst” are still used in:

- The name of the technical framework of the software provisioning manager. For more information about the current SAPinst Framework version, see SAP Note 3207613 (SAPinst Framework 753 Central Note).
- Texts and screen elements in the the software provisioning manager’s SL-UI
- Names of executables, for example sapinst.exe
- Names of command line parameters, for example SAPINST_STACK_XML
- “usage type”, “technical usage”, and “product instance”

As of software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12), the term “product instance” replaces the terms “usage type” and “technical usage”. For more information, see SAP Note 1970349. For more information, see New Features [page 21].

- “SAP system” refers to SAP system based on the application server of 7.3 including Enhancement Package 1 / Application Server ABAP 7.4 / SAP NetWeaver 7.4 / SAP NetWeaver 7.5 / SAP NetWeaver Application Server for ABAP 7.51 innovation package / SAP NetWeaver Application Server for ABAP 7.52.
- “Diagnostics Agent” refers to the SAP Solution Manager Diagnostics Agent which is the remote component of End-to-End Root Cause Analysis. It allows having a connection between SAP Solution Manager and managed systems, and then to collect information from the managed systems for reporting purposes.

1.3 Constraints

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

- Effective immediately, the software provisioning manager no longer supports the deprecated Windows operating system versions 2998013 listed in SAP Note 2998013.

**i Note**

- If your current operating system is listed as deprecated in SAP Note 2998013, we strongly recommend that you migrate to a supported platform.
- If you continue to run Software Provisioning Manager on the deprecated Windows operating system versions listed in SAP Note 2998013, you do so at your own risk and without support from SAP. The software provisioning manager 1.0 SP39 and higher will still run on the deprecated Windows operating system versions listed in SAP Note 2998013 but it may run into an error. When you start the software provisioning manager, you will see a warning like the following: “Platform Support : Support for SAP JVM on Windows Server 2012 (R2) ends October 31th, 2023. See SAP note 2998013.” If you run into an issue, you must use the “frozen” software provisioning manager 1.0 SP38 software and the related installation guide. For more information, see SAP Note 3346502.

- Effective immediately, the software provisioning manager no longer supports the deprecated operating system versions 2998013 listed in SAP Note 2998013.

**i Note**

- If your current operating system is listed as deprecated in SAP Note 2998013, we strongly recommend that you migrate to a supported platform.
• If you continue to run Software Provisioning Manager on the deprecated operating system versions listed in SAP Note 2998013, you do so at your own risk and without support from SAP. The software provisioning manager 1.0 SP36 and higher will still run on the deprecated operating system versions listed in SAP Note 2998013, but it may run into an error. When you start the software provisioning manager, you will see a warning like the following: "Platform Support: Support for SAP JVM on Windows Server 2008 (R2) ends January 14th, 2022. See SAP note 2998013." If you run into an issue, you must use the “frozen” software provisioning manager 1.0 SP35 software and the related installation guide. For more information, see SAP Note 3220901.

• End of support for SAP products based on SAP NetWeaver 7.10, 7.11, 7.20, 7.30, 7.40 SR1

i Note

SAP products based on SAP NetWeaver 7.10, 7.11, 7.20, 7.30, 7.40 SR1 (with the exception of SAP Solution Manager 7.2 ABAP, which will continue to be supported) are only supported in mainstream maintenance until the end of 2020. Extended maintenance will not be provided.

For more information, see SAP Note 2980160.

You can download the last published version of the guide set for the last Software Provisioning Manager 1.0 SP30 for out-of-maintenance products (SWPM1ORMSP30_<Version>.SAR) from SAP Note 2980160. The guide set attached to SAP Note 2980160 covers only the SAP product versions which have reached end of maintenance.

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

• Not all SAP NetWeaver releases or SAP Business Suite applications that are available in Software Provisioning Manager 1.0 and are described in this installation guide have already been released. Always check the list of supported products [page 13] and SAP Note 1680045 to ensure that the installation options you want to perform are already supported. For information about supported operating system and database platforms, see the Product Availability Matrix at http://support.sap.com/pam.

• Note that a complete system installation from scratch is not available for every product. For some products - such as SAP NetWeaver 7.5 - a complete new system installation from scratch is only provided for the highest support release. If there are one or more support releases, then a complete system installation is only available for the highest of these support releases. As for the lower support releases, only options for system copy and additional application server instances are provided.

• Your operating system platform must be 64-bit.

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

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

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

The “Master Guide” - also called “Installation Guide” for SAP S/4HANA - is the central document leading you through the overall implementation process for your SAP system installation. It contains crucial information about the overall implementation sequence, that is activities you have to perform before and after the installation process described in this installation guide.

You can find a printed version of this guide in your installation package or you can download the latest version from https://help.sap.com.

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

<table>
<thead>
<tr>
<th>Document</th>
<th>Internet Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[Release] Product Documentation [Installation Guide]</td>
</tr>
<tr>
<td></td>
<td>[Installation and Upgrade]</td>
</tr>
<tr>
<td></td>
<td>[Installation and Upgrade]</td>
</tr>
<tr>
<td>innovation package</td>
<td>[Installation and Upgrade]</td>
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<tr>
<td></td>
<td>[Installation and Upgrade]</td>
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<tr>
<td></td>
<td>7.2 [SP] Installation and Upgrade</td>
</tr>
<tr>
<td>&lt;Including SAP Enhancement Package</td>
<td>[Release] Installation and Upgrade</td>
</tr>
<tr>
<td>&lt;Number&gt; Powered by SAP NetWeaver</td>
<td></td>
</tr>
</tbody>
</table>
1.5 SAP Notes for the Installation

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

You must read the following SAP Notes before you start the installation. These SAP Notes contain the most recent information on the installation, as well as corrections to the installation documentation.

Make sure that you have the up-to-date version of each SAP Note, which you can find at https://support.sap.com/notes.

### SAP Notes for the Installation

<table>
<thead>
<tr>
<th>SAP Note Number</th>
<th>Title</th>
<th>Description</th>
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</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>1710950</td>
<td>Inst. SAP Systems Based on SAP NetWeaver 7.1 and higher: Windows</td>
<td>Windows-specific information about the SAP system installation and corrections to this documentation</td>
</tr>
<tr>
<td>2365849</td>
<td>Installation of SAP Systems Based on SAP NetWeaver: SAP HANA Database</td>
<td>Platform-specific information about the SAP system installation and corrections to this documentation</td>
</tr>
<tr>
<td>SAP Note Number</td>
<td>Title</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>1830427</td>
<td>Installation of SCM on HANA with integrated liveCache</td>
<td>This SAP Note contains information that is specific to the SAP system installation of SCM on HANA with integrated liveCache</td>
</tr>
<tr>
<td>2384179</td>
<td>Planned support of Windows Server 2016 for SAP products</td>
<td>Windows Server 2016-specific information for the SAP system installation</td>
</tr>
<tr>
<td>3143497</td>
<td>SAP Systems on Windows Server 2022</td>
<td>Windows Server 2022-specific information for the SAP system installation</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>1067221</td>
<td>Composite SAP Note for heterogeneous installation</td>
<td>This SAP Note and its related SAP Notes describe the released operating system and database combinations for heterogeneous SAP systems landscapes.</td>
</tr>
<tr>
<td>789220</td>
<td>Support Package levels for SAP NetWeaver installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP NetWeaver release</td>
</tr>
<tr>
<td>819722</td>
<td>Support Package levels for SRM installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP SRM release</td>
</tr>
<tr>
<td>774615</td>
<td>Support Package levels of ERP/ECC installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP ERP release</td>
</tr>
<tr>
<td>837413</td>
<td>Support Package levels for CRM installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP CRM release</td>
</tr>
<tr>
<td>850038</td>
<td>Support Package levels for SCM/APO installations/upgrades</td>
<td>Information about the ABAP Support Package levels and kernel patch levels contained in the current SAP SCM release</td>
</tr>
<tr>
<td>1990240</td>
<td>Support of mixed landscapes (Unicode and Non-Unicode)</td>
<td>Temporarily your system landscape is mixed with Unicode and Non-Unicode systems. You have third party software in your system landscape which does not support Unicode at all. You wonder whether such a heterogeneous system landscape is supported without restrictions.</td>
</tr>
<tr>
<td>1514967</td>
<td>SAP HANA: Central Note</td>
<td>SAP HANA: Central Note</td>
</tr>
<tr>
<td>SAP Note Number</td>
<td>Title</td>
<td>Description</td>
</tr>
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</tr>
<tr>
<td>2021789</td>
<td>SAP HANA Revision and Maintenance Strategy</td>
<td>SAP HANA Revision and Maintenance Strategy</td>
</tr>
<tr>
<td>1523337</td>
<td>SAP HANA Database: Central Note</td>
<td>SAP HANA Database: Central Note</td>
</tr>
<tr>
<td>1793345</td>
<td>Sizing for SAP Suite on HANA</td>
<td>Sizing for SAP Suite on HANA</td>
</tr>
<tr>
<td>1872170</td>
<td>Suite on HANA Memory Sizing</td>
<td>Suite on HANA Memory Sizing</td>
</tr>
<tr>
<td>2235581</td>
<td>SAP HANA: Supported Operating Systems, contains related SAP Notes for recommended OS settings for supported Linux releases</td>
<td>SAP HANA: Supported Operating Systems, contains related SAP Notes for recommended OS settings for supported Linux releases</td>
</tr>
<tr>
<td>886535</td>
<td>Downloading multispansing archives</td>
<td>Downloading multispansing archives</td>
</tr>
<tr>
<td>1553465</td>
<td>Installation requirements for SAP kernels on Windows (C++ runtime environment, VCre dist versions)</td>
<td>Information about VCre dist version</td>
</tr>
</tbody>
</table>

### 1.6 New Features

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


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<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separate SAP Globalhost</td>
<td>During the installation of an SAP system distributed over several hosts, you can now specify that the SAP Global directories are installed on a host different from the ASCS instance host. For more information, see SAP Note 3349121.</td>
<td>software provisioning manager 1.0 SP39 (SL Toolset 1.0 SP39)</td>
</tr>
<tr>
<td>New SAPinst Framework Version 753</td>
<td>The SAPinst framework patch level has been upgraded from version 749 (SAP Note 2393060 SAPinst Framework 749 Central Note) to 753. For more information, see SAP Note 3207613 SAPinst Framework 753 Central Note.</td>
<td>software provisioning manager 1.0 SP36 (SL Toolset 1.0 SP36)</td>
</tr>
<tr>
<td>Installation requirements for SAP kernels on Windows (C++ runtime environment, VCre dist versions)</td>
<td>Manual subsequent installation of the VCre dist files by customers may be required during the installation of SAP kernels that are based on specific versions. For more information, see Requirements for the SAP System Hosts [page 43].</td>
<td>software provisioning manager 1.0 SP34 (SL Toolset 1.0 SP34)</td>
</tr>
<tr>
<td>Switch from 7.21_EXT Kernel to 7.22_EXT Kernel</td>
<td>Kernel 7.21 has reached end of maintenance. In addition, some issues have been fixed with the new 7.22_EXT kernel media.</td>
<td>software provisioning manager 1.0 SP31 (SL Toolset 1.0 SP31)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
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</tr>
<tr>
<td>Configuring the Number of Work Processes during the Installation</td>
<td>You can now enter the number of work processes interactively when performing an installation in custom mode. For more information, see Basic Installation Parameters [page 48].</td>
<td>software provisioning manager 1.0 SP30 (SL Toolset 1.0 SP30)</td>
</tr>
<tr>
<td>Support of SAP HANA SSL Certificates</td>
<td>Software Provisioning Manager 1.0 supports SAP HANA SSL Certificates for configuring secure access to the SAP HANA database. For more information, see Establishing Secure Connection to the SAP HANA Database [page 78].</td>
<td>software provisioning manager 1.0 SP29 (SL Toolset 1.0 SP29)</td>
</tr>
<tr>
<td>Support of Secure Connection to SAP HANA database</td>
<td>Software Provisioning Manager 1.0 supports configuring the SAP system to be installed to access the SAP HANA database using encryption. For more information, see Establishing Secure Connection to the SAP HANA Database [page 78].</td>
<td>software provisioning manager 1.0 SP26 (SL Toolset 1.0 SP26)</td>
</tr>
<tr>
<td>New Look and Feel of SL-UI</td>
<td>As of version 1.0 SP24 Patch Level (PL) 5, the software provisioning manager comes with a new look and feel of the SL-UI. For more information, see <a href="https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/">https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/</a>.</td>
<td>software provisioning manager 1.0 SP24, PL05 (SL Toolset 1.0 SP24)</td>
</tr>
<tr>
<td>High-availability system on Microsoft Cluster: Option to install the ASCS instance in a file share on a local disk</td>
<td>As an alternative to the “classic” way to install the ASCS instance on a shared disk, you can now choose to install the ASCS instance in a file share on a local disk. For more information, see High Availability with Microsoft Failover Clustering [page 185].</td>
<td>software provisioning manager 1.0 SP24 (SL Toolset 1.0 SP24)</td>
</tr>
<tr>
<td>New software provisioning manager Option Download Software Packages for Maintenance Planner Transaction</td>
<td>If you perform an installation using a Stack XML file, you can now download media according to a Maintenance Plan. For more information, see Installation Using a Stack XML File [page 38], Downloading Software Packages for a Maintenance Planner Transaction [page 92], and <a href="https://blogs.sap.com/2018/06/01/software-provisioning-manager-new-option-for-standalone-download-service/">https://blogs.sap.com/2018/06/01/software-provisioning-manager-new-option-for-standalone-download-service/</a>.</td>
<td>software provisioning manager 1.0 SP23 (SL Toolset 1.0 SP23)</td>
</tr>
<tr>
<td>Validity Check for SUM*.SAR Archive</td>
<td>If you perform an installation using a Stack XML file and choose to extract the SUM*.SAR archive, the validity of this archive is now checked by the software provisioning manager. For more information, see Extract the SUM*.SAR Archive in Additional Parameters When Using a Stack XML File [page 64].</td>
<td>software provisioning manager 1.0 SP23 (SL Toolset 1.0 SP23)</td>
</tr>
<tr>
<td>Secure ABAP Message Server Connection</td>
<td>The software provisioning manager now uses secure connections to the ABAP message server of the SAP system being installed. For more information, see the ABAP Message Server Port entry within the Ports table in SAP System Parameters [page 50].</td>
<td>software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>software provisioning manager Log Files Improvements</td>
<td>software provisioning manager log files are now available immediately after software provisioning manager has been started, that is before a product has been selected on the Welcome screen. For more information, see Useful Information about Software Provisioning Manager [page 108] and Troubleshooting with Software Provisioning Manager [page 119].</td>
<td>software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td>Digital Signature Check of Installation Archives</td>
<td>The digital signature of installation archives is checked automatically by software provisioning manager during the Define Parameters phase while processing the Software Package Browser screens. As of now software provisioning manager only accepts archives whose digital signature has been checked. For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 89].</td>
<td>software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td>LOADTOOLS.SAR archive in software provisioning manager enabled for NUC</td>
<td>The load tools in SWPM10SP_&lt;Support_Package_Number&gt;_&lt;Version_Number&gt; . SAR are now also enabled for an installation using non-Unicode (NUC) SAP kernel version 7.40 or higher. For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87]</td>
<td>software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td>Enabling IPv6</td>
<td>You can now set up a new SAP system or SAP system instance using Internet Protocol Version 6 (IPv6). For more information, see Prerequisites for Running Software Provisioning Manager [page 99].</td>
<td>software provisioning manager 1.0 SP22 (SL Toolset 1.0 SP22)</td>
</tr>
<tr>
<td>Media Signature Check</td>
<td>The digital signature of media is checked automatically by the software provisioning manager during the Define Parameters phase while processing the Media Browser screens. The software provisioning manager only accepts media whose digital signature has been checked. For more information, see Preparing the Installation Media [page 80] and Running the software provisioning manager [page 101].</td>
<td>software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td>SAP Host Agent Upgrade During the Installation (Optional)</td>
<td>During the Define Parameters phase of the installation, software provisioning manager prompts you whether you want to upgrade an existing version of the SAP Host Agent on the installation host. If there is no SAP Host Agent on the installation host, it is installed automatically without prompt. For more information, see the General Parameters table in SAP System Parameters [page 50].</td>
<td>software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Simplified Additional Application Server Instance Installation</td>
<td>During an additional application server installation, SAP kernel archives are only prompted if they cannot be retrieved from the primary application server instance of the existing SAP system. For more information, see Preparing the Installation Media [page 80].</td>
<td>software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td>LOADTOOLS.SAR archive in software provisioning manager</td>
<td>An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuptool - which were available so far only in the SAPEXEDB.SAR archive of the kernel media, has now been made available in the software provisioning manager archive. For more information, see SAP Note 2472835. For an installation using Unicode kernel version 7.40 or higher, the load tools from the SWPM&lt;Support_Package_Number&gt;_&lt;&lt;Version_Number&gt;.SAR are used automatically. For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87].</td>
<td>software provisioning manager 1.0 SP21 (SL Toolset 1.0 SP21)</td>
</tr>
<tr>
<td>SL-UI with SAPINST 7.49</td>
<td>With the new software provisioning manager framework version SAPINST 7.49, you can now use the new SAPUI5-based graphical user interface (GUI) “SL-UI”. For more information, see Useful Information about Software Provisioning Manager [page 108], Running Software Provisioning Manager [page 101].</td>
<td>software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)</td>
</tr>
<tr>
<td>Option to install an SAP Gateway in an ASCS instance</td>
<td>You can now install an SAP Gateway in an ASCS instance. You can choose this option while running the ASCS instance installation. For more information, see ASCS Instance with Embedded Gateway [page 34]</td>
<td>software provisioning manager 1.0 SP20 (SL Toolset 1.0 SP20)</td>
</tr>
<tr>
<td>Verification of Integrity of Data Units in software provisioning manager</td>
<td>The integrity of data units extracted from the software provisioning manager archive is verified. For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87]. 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>Archive-based Language Installation</td>
<td>If you perform an installation using a Stack XML file, you can now add language archives to the download basket and use them for language installation. This feature is currently restricted to the latest products only. For more information, see Additional Parameters When Using a Stack XML File [page 64].</td>
<td>software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)</td>
</tr>
<tr>
<td>Option to install an SAP Web Dispatcher in an ASCS instance</td>
<td>You can now install an SAP Web Dispatcher in an ASCS instance. You can choose this option while running the ASCS instance installation. For more information, see ASCS Instance with Embedded SAP Web Dispatcher [page 32]</td>
<td>software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
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</tr>
<tr>
<td>Archive-Based Installation</td>
<td>You can now download the required installation archives instead of the complete SAP kernel installation media. For more information, see section Downloading Specific Installation Archives (Archive-Based Installation) in Preparing the Installation Media [page 80].</td>
<td>software provisioning manager 1.0 SP17 (SL Toolset 1.0 SP17)</td>
</tr>
<tr>
<td>Diagnostics Agent</td>
<td>The Diagnostics Agent is no longer installed automatically with the SAP system. The Install Diagnostics Agent check box on the Install Diagnostics Agent screen is no longer available. You now have to install the Diagnostics Agent always separately. We recommend that you install it prior to the installation of your SAP system(s). For more information, see the Diagnostics Agent Installation Strategy attached to SAP Note 1365123, to SAP Note 1833501, and to SAP Note 1858920 and the attached Diagnostics Agent Setup Guide.</td>
<td>software provisioning manager 1.0 SP10 (SL Toolset 1.0 SP16)</td>
</tr>
<tr>
<td>System Provisioning for SAP NetWeaver 7.5 and SAP NetWeaver 7.5-based Products</td>
<td>All system provisioning tasks (installation, system copy, system rename) are available for the new SAP NetWeaver 7.5 release. The Dual Stack option, which integrates an AS ABAP and AS Java in a single system (common System ID &lt;SAPSID&gt;, common startup framework, common database), is no longer supported in SAP systems based on SAP NetWeaver 7.5. • After upgrading to SAP NetWeaver 7.5 PI, you first have to split the still existing dual stack-system before you can use SAP NetWeaver 7.5 PI productively. For more information, see the Upgrade Master Guide - SAP NetWeaver 7.5 at: <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a> • SAP NetWeaver 7.5 is Unicode only • The primary application server instance directory has been renamed from /usr/sap/&lt;SAPSID&gt;/DVEBMGS&lt;Instance_Number&gt; to /usr/sap/&lt;SAPSID&gt;/D&lt;Instance_Number&gt;. For more information, see SAP Directories [page 164]. • Declustering and depooling of tables during the installation is enabled by default. For more information, see SAP Note 1892354.</td>
<td>software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>---------</td>
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<td>--------------</td>
</tr>
<tr>
<td>System Provisioning for SAP Solution Manager 7.2</td>
<td>All system provisioning tasks (installation, system copy, system rename) are available for the new SAP Solution Manager 7.2 release. Compared to previous SAP Solution Manager releases, SAP Solution Manager 7.2 is no longer provided as a classical dual-stack system (ABAP system with Java Add-in), but consists of a separate ABAP and Java stack.</td>
<td>software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)</td>
</tr>
<tr>
<td>Windows Domain Organizational Units</td>
<td>You can now specify an optional organizational unit (OU) within the Windows domain where you want software provisioning manager to create the SAP system accounts. For more information, see SAP System Parameters [page 50].</td>
<td>software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)</td>
</tr>
<tr>
<td>Creating Kernel Archives from existing SAP System</td>
<td>You can reuse the binaries of a dedicated SAP system for a new SAP system installation or target system installation in the context of a system copy by creating *.SAR archives based on the *.lst files from the executable (exe) directories of the source SAP system.</td>
<td>software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)</td>
</tr>
<tr>
<td>Installation Using a Stack XML File</td>
<td>You can start software provisioning manager using a Stack XML file generated by the Maintenance Planner. The configuration parameters in this file can then be used by software provisioning manager to improve the integration with SUM and to simplify the process of installation for a new system on target software level. For more information, see Installation Using a Stack XML File [page 38].</td>
<td>software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
<tr>
<td>Adaptive Installation</td>
<td>You can assign virtual host names to SAP system instances during the input phase of the installation directly on the screens where you define the instance parameters. For more information, see SAP System Parameters [page 50].</td>
<td>software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
</tbody>
</table>
### Feature Evaluation Form

SAP SE’s aim is to provide fast and efficient procedures. To evaluate the procedure you just carried out, we need information generated by the tool during process execution and your experience with the tool itself. A new evaluation form contains a simple questionnaire and XML data generated during the procedure.

Port 4239 is used for displaying the feedback evaluation form. For more information, see [Prerequisites for Running Software Provisioning Manager](#) [page 99].

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback Evaluation Form</td>
<td>SAP SE’s aim is to provide fast and efficient procedures. To evaluate the procedure you just carried out, we need information generated by the tool during process execution and your experience with the tool itself. A new evaluation form contains a simple questionnaire and XML data generated during the procedure. Port 4239 is used for displaying the feedback evaluation form. For more information, see <a href="#">Prerequisites for Running Software Provisioning Manager</a> [page 99].</td>
<td>software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)</td>
</tr>
</tbody>
</table>

---

### Option Verify Signed Media

The digital signature ensures that the signatory of a digital document can be identified unambiguously and signatory’s name is documented together with the signed document, the date, and the time.

For more information, see SAP Note [1979965](https://support.sap.com/).
2 Installation Options Covered by this Guide

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

**Note**

Regardless of whether you are installing a standard, distributed, or high-availability system, the SAP HANA database is normally installed on a dedicated database server. It is normally pre-installed by SAP partners before you start the installation of the SAP system instances. During the installation of the SAP system, the software provisioning manager accesses the SAP HANA database remotely to perform the necessary database-specific installation steps.

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

After you have decided on the installation option that you want to use, continue with Planning [page 37].

- Standard System [page 28]
- Distributed System [page 29]
- High Availability System [page 30]
- Additional Application Server Instance [page 30]
- ASCS Instance with Embedded SAP Web Dispatcher [page 32]
- ASCS Instance with Embedded Gateway [page 34]

2.1 Standard System

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

There are the following instances:

- ABAP Central services instance (ASCS instance)
  Contains the ABAP message server and the Standalone Enqueue Server
  In a standard
  - Optionally, you can install the ASCS instance with an embedded SAP Web Dispatcher. For more information, see ASCS Instance with Embedded SAP Web Dispatcher [page 32].
  - Optionally, you can install the ASCS instance with an embedded gateway. For more information, see ASCS Instance with Embedded Gateway [page 34].
- SAP HANA database instance (DB)
- Primary application server instance (PAS instance)
2.2 Distributed System

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

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

A distributed system consists of the following instances:

- **ABAP Central services instance (ASCS instance)**
  Contains the ABAP message server and the Standalone Enqueue Server
  - Optionally, you can install the ASCS instance with an embedded SAP Web Dispatcher. For more information, see [ASCS Instance with Embedded SAP Web Dispatcher](#).
  - Optionally, you can install the ASCS instance with an embedded gateway. For more information, see [ASCS Instance with Embedded Gateway](#).
- **SAP HANA database instance (DB)**
  The ABAP stack uses its own database schema in the database.
- **Primary application server instance (PAS)**

The following figure assumes the following:

- The ASCS and primary application server instance run on the SAP global host.
- You can also install the primary application server instance on a separate host.
- The global transport directory resides on a separate SAP transport host.
During the installation of an SAP system distributed over several hosts, you can now specify that the SAP Global directories are installed on a host different from the ASCS instance host. For more information, see SAP Note 3349121.

Optionally, you can install one or more additional application server instances. For more information, see Installation of an Additional Application Server Instance [page 30].

2.3 High Availability System

For more information about the system components you have to install and how to distribute them on the specific hosts, see System Configuration with Microsoft Failover Clustering [page 189].

*Note

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

2.4 Additional Application Server Instance

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

- The host of any instance of the existing SAP system
- On a dedicated host

**i Note**

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

**i Note**

If you want to install an additional application server instance on an existing SAP system, you must perform a domain installation. You must also make sure that your existing SAP system was installed as a domain installation. For more information, see *Domain or Local Installation* [page 47].

**Additional Application Server Instance for a Standard System**

The following figure shows additional application server instances that are running on dedicated hosts.

For more information, see *Standard System* [page 28].
Additional Application Server Instance for a Distributed System

The following figure shows additional application server instances that are running on dedicated hosts.

For more information, see Distributed System [page 29].

Only valid for ‘High Availability’: HA (Windows)

Additional Application Server Instance for a High-Availability System

In a high-availability system, you require, apart from the primary application server instance, at least one additional application server instance. For more information about how to install and distribute the application servers in an HA configuration, see section System Configuration with Microsoft Failover Clustering [page 189].

End of ‘High Availability’: HA (Windows)

2.5 ASCS Instance with Embedded SAP Web Dispatcher

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

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

i Note

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

ASCS Instance with Embedded SAP Web Dispatcher

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

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

The SAP Web Dispatcher receives information about the SAP system that it needs for load distribution (load balancing) from the message server and application server via HTTP.
Installation of “Standalone” SAP Web Dispatcher with its own <SAPSID> and Instance

If you want to install an SAP Web Dispatcher for another system - that is not for the system for which you use the ASCS instance and with its own SAP system ID and instance number - you have to install SAP Web Dispatcher separately as described in the documentation Installation of SAP Web Dispatcher for SAP Systems Based on SAP NetWeaver 7.0 to 7.52 on <OS> which you can find at https://support.sap.com/sitoolset

More Information

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

SAP Release and SAP Library Quicklink

| SAP NetWeaver 7.3 including Enhancement Package 1  | http://help.sap.com/nw731 |
| SAP NetWeaver 7.4  | http://help.sap.com/nw74 |
| SAP NetWeaver 7.5  | http://help.sap.com/nw75 |
| SAP NetWeaver AS for ABAP 7.52  | https://help.sap.com/nw752abap |

SAP Library Path (Continued)

Application Help ➤ Function-Oriented View ➤ Application Server ➤ Application Server Infrastructure ➤ Components of SAP NetWeaver Application Server ➤ SAP Web Dispatcher

Related Information

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

2.6 ASCS Instance with Embedded Gateway

You can install a gateway embedded in the ASCS instance. If you select this option, a gateway is installed within the ASCS instance.
The gateway enables communication between work processes and external programs, as well as communication between work processes from different instances or SAP systems.

**Recommendation**

A gateway embedded in the ASCS instance is recommended, for example, when you set up a Microsoft Failover Cluster.

You can also install a standalone gateway instance. For more information, see the documentation [Installation Guide – Installation of a Standalone Gateway Instance for SAP Systems Based on SAP NetWeaver 7.1 to 7.5x](https://support.sap.com/sltoolset) > [Installation Option of Software Provisioning Manager 1.0](https://support.sap.com/sltoolset) > [Installation Guides - Standalone Engines and Clients - Software Provisioning Manager 1.0](https://support.sap.com/sltoolset) > [Standalone Gateway Instance](https://support.sap.com/sltoolset).

**Caution**

In Microsoft Failover Cluster installations, do not install a standalone gateway on cluster nodes. Instead, follow the instructions in SAP Note [1764650](https://support.sap.com/sapn).

For more information on how to configure a standalone gateway in an ASCS instance for High-Availability, see SAP Note [1010990](https://support.sap.com/sapn).
Related Information

High Availability with Microsoft Failover Clustering [page 185]
Parameters for Additional Components to be Included in the ASCS Instance [page 66]
3 Planning

3.1 Planning Checklist

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

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

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

Prerequisites

1. You have planned your SAP system landscape according to the Master Guide available at the appropriate download location as described in Before You Start [page 18].
2. You have decided on your installation option (see Installation Options Covered by this Guide [page 28]).

Standard, Distributed, or High-Availability System

**Note**

In a standard system [page 28], all mandatory instances except the database instance are normally installed on one host. Therefore, if you are installing a standard system, you can ignore references to other hosts.

The SAP HANA database is normally pre-installed by SAP partners before you start the installation. For more information about how to install the SAP HANA database, see the SAP HANA Server Installation and Update Guide at https://help.sap.com/hana_platform. The database instance is remotely installed by the software provisioning manager from the primary application server host.

1. **Installation Using a Stack XML File [page 38]:**
   If you want to install an SAP ABAP system along with the required Support Package stack and ABAP Add-Ons in one implementation run, you need to plan the desired installation target using the maintenance planner at https://apps.support.sap.com/sap/support/mp.
   In the maintenance planner, a stack XML file with the desired Support Package stack and Add-On information is generated, which you then hand over to the software provisioning manager by calling it with command line parameter `SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>`. Included constraints and defaults defined in the stack XML file are then used for the initial installation by Software Provisioning Manager and for the application of Support Package stacks and Add-Ons by the Software Update Manager (SUM).
Recommendation

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

2. **Installation Using a Stack XML File [page 38]:**
   If you want to install an SAP Process Integration 7.5 system or an SAP Solution Manager 7.2 system comprising ABAP and Java, both the ABAP and the Java system must be installed with the identical Support Package (SP) level.

3. You check the hardware and software requirements [page 41] on every installation host.

4. You plan how to set up user and access management [page 47].

5. You identify Basic SAP System Installation Parameters [page 48].

6. You decide whether you want to perform a domain or local installation [page 47].

7. You decide on the transport host to use [page 67].

8. You decide whether you want to integrate LDAP Directory Services in your SAP system [page 160].

9. **Only valid for “High Availability”: HA (Windows)**
   To install a high-availability system with **Microsoft Failover Clustering**, you perform the HA-specific planning steps [page 187].

10. Optionally, you decide whether you want to install multiple components in one database (MCOD) [page 172].

11. Continue with Preparation [page 68].

### Additional Application Server Instance

1. You check the hardware and software requirements [page 41] for every installation host on which you want to install one or more additional application server instances.

2. You identify Basic SAP System Installation Parameters [page 48].

3. Continue with Preparation [page 68].

### 3.2 Installation Using a Stack XML File

The option to perform an installation using a Stack XML file (also called “up-to-date installation” or “UDI” for short) improves the process of provisioning an up-to-date SAP system by creating a unified consumption experience and a direct close collaboration between the involved tools, namely:

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

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

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

i Note

During Maintenace Planner stack generation, SAP HANA and non-SAP HANA SUM archives are provided. Exclude the SUM archive which is not applicable for the new system planning from the stack generation.

Restrictions

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

Prerequisites

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

Features

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

- You can use a Stack XML file generated by the Maintenance Planner at https://apps.support.sap.com/sap/support/mp. The parameters contained in the Stack XML file can then be processed by software provisioning manager to get better integrated with SUM and to simplify the process of installation for a new system on a target software level. This makes IT administration easier by reducing the efforts in Total Cost of Ownership (TCO). For more information, see the Best Practice Guide to Planning Landscape Changes at https://support.sap.com/en/tools/software-logistics-tools/landscape-management-process.html.
- When processing a Stack XML file, software provisioning manager can take over more default settings that are already predefined in the Maintenance Planner and offers more possibilities for automation as compared to when running without it. For more information about the benefits by comparing the existing process with the new improved process, see Up-To-Date Installation at https://blogs.sap.com/2016/10/21/up-to-date-installation-2/.

i Note

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

- You can also run an installation using a Stack XML file in unattended mode as described in System Provisioning Using an Input Parameter File [page 109].
- You can use software provisioning manager to directly download the installation software from SAP by providing the Maintenance Plan to software provisioning manager while running software provisioning manager option Download Software Packages for Maintenance Planner Transaction. For more information, see Downloading Software Packages for a Maintenance Planner Transaction [page 92].

Integration

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

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

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

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

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

- Planning Checklist [page 37]
- Additional Parameters When Using a Stack XML File [page 64]
- Downloading Software Packages for a Maintenance Planner Transaction [page 92]
- Running Software Provisioning Manager [page 101]
- Configuring the Change and Transport System [page 135]
- Applying the Latest Kernel and Support Package Stacks [page 140]
- Installing Additional Languages and Performing Language Transport [page 145]
3.3 Hardware and Software Requirements

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

**Prerequisites**

- Make sure that the host name meets the requirements listed in SAP Note 611361.
- Contact your OS vendor for the latest OS patches.

**Procedure**

1. Check the Product Availability Matrix at http://support.sap.com/pam for supported operating system releases.
2. Check the hardware and software requirements using:
   - The Prerequisite Checker:
     - Standalone (optional) before the installation process
       For more information, see Running the Prerequisites Check Standalone [page 42].
     - Integrated in the installation tool (mandatory) as part of the installation process
       For more information, see Running Software Provisioning Manager [page 101].
   - The hardware and software requirements tables in Requirements for the SAP System Hosts [page 43]
3. If you want to install a production system, the values provided by the Prerequisite Checker and the hardware and software requirements checklists are not sufficient. In addition, do the following:
   - You contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing depending on:
     - The set of applications to be deployed
     - How intensively the applications are to be used
     - The number of users
3.3.1 Running the Prerequisites Check in Standalone Mode (Optional)

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

**Context**

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

**Recommendation**

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

**Procedure**

1. Download and unpack the Software Provisioning Manager archive to a local directory as described in Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87].
2. Make either the separate SAPEXE<Version>.SAR archive or the complete kernel medium available as described in Preparing the Installation Media [page 80].
3. Start the software provisioning manager as described in Running Software Provisioning Manager [page 101].
4. On the Welcome screen, choose <SAP_Product> <Database> Preparations > Prerequisites Check.
5. Follow the instructions in the software provisioning manager dialogs and enter the required parameters.

**Note**

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

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

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

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

Related Information

Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87]
Preparing the Installation Media [page 80]

3.3.2 Requirements for the SAP System Hosts

Hardware and Software Requirements

The following tables show the hardware and software requirements. Most of the requirements are valid for every installation host whereas some requirements are instance-specific and are marked accordingly.

i Note

• The listed values are sufficient for development systems or quality assurance systems but not for production systems.
• If you install several SAP instances on one host, you need to add up the requirements.
• For up-to-date information on the released and supported operating system versions for your SAP product and database, see the Product Availability Matrix (PAM) at:
  http://support.sap.com/pam/.
## Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement</th>
<th>How to Check</th>
</tr>
</thead>
</table>
| Minimum disk space | - ABAP central services instance (ASCS) (not including paging file): 5 GB (x64)  
  - If you install the ASCS instance with an embedded SAP Web Dispatcher, for the installation as such you require at least 1 GB of hard disk space in addition. For production use of the SAP Web Dispatcher, you need to reserve at least 5 GB.  
  - If you install an SAP Gateway with the ASCS instance, you require at least 1 GB of hard disk space in addition. | To check disk space:  
1. Open PowerShell in elevated mode, and enter the following command: `get-volume`  
2. Check the value `SizeRemaining` of the disk you want to install on. |
|             | **High Availability only:** Enqueue replication server instance (ERS) (not including paging file): 5 GB (x64) | **End of 'High Availability': HA (Windows)** |
|             | - Primary application server instance (not including paging file): 5 GB (x64)  
  - Additional application server instance (not including paging file): 2.5 GB (x64)  
  - SAP Host Agent: 256 MB  
  - Temporary disk space for every required installation medium that you have to copy to a local hard disk: Up to 6 GB | |
| Minimum RAM | - All instances, except SAP Host Agent: 4 GB  
  - If you install the ASCS instance with an embedded SAP Web Dispatcher, see SAP Note 2007212 for memory consumption in productive use.  
  - SAP Host Agent: 0.5 GB | To check RAM:  
Open PowerShell in elevated mode, and enter the following command: `Get-WmiObject Win32_ComputerSystem` |
| Paging file size | For more information, see SAP Note 1518419. | To check paging file size:  
For more information, see Checking and Changing the Paging File Settings on Windows Server [page 170] |
### Hardware Requirements

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

### Software Requirements

<table>
<thead>
<tr>
<th>Software Requirement</th>
<th>Requirement</th>
<th>How to Check</th>
</tr>
</thead>
</table>
| Windows operating system | • 64-bit version of one of the following Windows Server Editions:  
  • Windows Server Standard Edition  
  • Windows Server Datacenter Edition | To check your Windows version:  
Open PowerShell in elevated mode, and enter the following command:  
```powershell
Get-WmiObject Win32_OperatingSystem | select caption
```

Caution

For up-to-date information on the released and supported operating system versions for your SAP product and database, see the Product Availability Matrix (PAM) at [http://support.sap.com/pam](http://support.sap.com/pam).

Note

You must add the operating system feature Failover Clustering on all cluster nodes.

Caution

Make sure that you install the English language pack so that your support requests can be handled quickly.

• For any version of Windows Server, you need the latest supported service pack
### Software Requirement

**Important information about the delivery of Microsoft Visual C++ redistributables (VCredist) versions with software provisioning manager 1.0**

The software provisioning manager 1.0 no longer delivers any VCredist versions that are no longer in maintenance by the manufacturer Microsoft. SAP cannot therefore assume maintenance responsibility for these 3rd party components. At the time of delivery, this affects VCredist 2005 and 2010. As a result, a manual subsequent installation of the VCredist files by the customer may be required during the installation of SAP kernels that are based on these specified versions. For more information, see SAP Note 1553465 - *Installation requirements for SAP kernels on Windows (C++ runtime environment, VCredist versions)*.

### Windows regional settings

**English (United States)** must be set by default. For more information about localized Windows versions, see SAP Note 362379.

You can install additional languages but the default setting for new users must always be **English (United States)**.

Choose **Start > Control Panel > Clock, Language, and Region > Language**.

### Minimum Web Browser

Make sure that you have at least one of the following web browsers installed on the host where you run the software provisioning manager GUI:

- Microsoft Internet Explorer 11 or higher
- Microsoft Edge
- Mozilla Firefox
- Google Chrome

Always use the latest version of these web browsers.

You need a web browser to be able to run the SL-UI, and to display the Evaluation Form and send it to SAP.

Choose **Start > Control Panel > Programs and Features**.
3.4 Planning User and Access Management

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

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

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

Procedure

To specify the initial data source of the User Management Engine (UME), proceed as described in Specifying the Initial Data Source of the User Management Engine [page 99].

More Information

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

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quicklink</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
</table>
| - SAP NetWeaver 7.3 including Enhancement Package 1  
  Configuration of User and Role Administration  Directory Services  LDAP Connector |
| - SAP NetWeaver 7.4  http://help.sap.com/nw74athers | |
| - SAP NetWeaver 7.5  http://help.sap.com/nw75athers | |
| - SAP NetWeaver AS for ABAP 7.52  https://help.sap.com/nw752abapathers | |

3.5 Domain or Local Installation

Before you install the SAP system, you have to decide whether you want to perform a domain or local installation, since this affects how the user account information is stored and accessed.
For more information about the differences between a local and domain installation, go to Start Help and Support and search for What is the difference between a domain and a workgroup?

Domain Installation

In a domain installation, the user account information is stored centrally in one database on the domain controller and is accessible to all hosts in the system.

You have to perform a domain installation if one of the following applies:

- You install a distributed system.
- Only valid for ‘High Availability’: HA (Windows)
  You install a high-availability system with Microsoft Failover Clustering.
- End of ‘High Availability’: HA (Windows)
- You use a common transport host for several SAP systems running on different computers.

Local Installation

In a local installation, all Windows account information is stored locally on one host and is not visible to any other hosts in the system.

i Note

If your SAP system was installed as a local installation and you want to later change to a domain installation, you can use the system rename option. For more information, see the System Rename Guide for your SAP system at:

https://support.sap.com/sltoolset

More Information

Required User Authorization for Running Software Provisioning Manager [page 73]

3.6 Basic Installation Parameters

The software provisioning manager prompts for input parameters during the Define Parameters phase of the installation.

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

- Typical
  If you choose Typical, the installation is performed with default settings. This means that the software provisioning manager prompts you only for a small selection of installation parameters. These parameters include at least the following:
  - SAP system ID and database connectivity parameters
  - Master password
  - SAP system profile directory – only for systems with instances on separate hosts
• **SAP systems based on SAP NetWeaver 7.40 and higher**: Individual encryption key for the secure storage.

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

• **Custom**

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

**Note**

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

**Note**

• If you want to **ASCS Instance with Embedded SAP Web Dispatcher** [page 32], you must choose **Custom**. Otherwise, you are not prompted for the SAP Web Dispatcher installation parameters [page 66] during the **Define Parameters** phase of the ASCS instance installation.

• If you want to **ASCS Instance with Embedded Gateway** [page 34], you must choose **Custom**. Otherwise, you are not prompted for the SAP Gateway installation during the **Define Parameters** phase of the ASCS instance installation.

**Note**

- Only valid for ‘High Availability’ - HA (Windows)

**High Availability only**: If you decide to install an SAP Web Dispatcher or a Gateway in the ASCS instance, note that a failure of the SAP Web Dispatcher or the Gateway causes failover of the ASCS instance to another cluster node. The failover cluster monitors all processes that are started by the SAP start service (sapstartsrv.exe). For an ASCS instance this is: msg_server.exe (message server), enserver.exe (enqueue server), gwrd.exe (Gateway), and sapwebdisp.exe (SAP Web Dispatcher).

To prevent failover, see SAP Note 2375999.

End of ‘High Availability’ - HA (Windows)

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

**Related Information**

- SAP System Parameters [page 50]
- SAP System Database Parameters [page 60]
- Additional Parameters when Installing SAP Process Integration 7.5 or SAP Solution Manager 7.2 [page 62]
- Additional Parameters When Using a Stack XML File [page 64]
- Parameters for Additional Components to be Included in the ASCS Instance [page 66]
3.6.1 SAP System Parameters

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

General Parameters

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

**Example**

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

**Caution**

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

Make sure that your SAP system ID:

- Is unique throughout your organization. Do not use an existing <SAPSID> when installing a new SAP system.
- Consists of exactly three alphanumeric characters
- Contains only uppercase letters
- Has a letter for the first character
- Does not include any of the reserved IDs listed in SAP Note 1979280.
- If you want to install an additional application server instance, make sure that no Gateway instance with the same SAP System ID (SAPSID) exists in your SAP system landscape.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<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.</td>
</tr>
</tbody>
</table>

**Note**

If you install the central instance and the dialog instances on the cluster nodes of a Microsoft failover cluster, SAPinst by default assigns the same instance number.  
If you install the central instance and the dialog instances on hosts that are not part of a Microsoft failover cluster, we recommend that you use the same instance number for them. If the instance number is already used on other hosts, you have to assign a different instance number for the central instance and the dialog instances.

**End of ‘High Availability’: HA (Windows)**

To find out the instance numbers of SAP systems that already exist on the installation host, look for subdirectories ending with `<Instance Number>` of local `\usr\sap\<SAPSID>` directories.

For more information, see [SAP Directories](page 164).

**Caution**

Do **not** use 43, and 89 for the instance number because:  
- 43 is part of the port number for high availability  
- 89 is part of the port number for Windows Terminal Server
Virtual Host Name

Virtual host name (network name) of the SAP<SAPSID> cluster group

You can assign a virtual host name to an SAP instance in one of the following ways:

- You can assign a virtual host name for the instance to be installed, by specifying it in the <Instance Name> Host Name field of the <Instance Name> Instance screen. Then this instance is installed with this virtual host name.
- Alternatively you can assign virtual host names also by starting the software provisioning manager with the SAPINST_USE_HOSTNAME property. For more information, see Running Software Provisioning Manager [page 101].

After the installation has completed, all application servers can use this virtual host name to connect to the instance. If you do not provide the virtual host name, the instance is installed automatically using the physical host name (= Windows host name) of the host where you run the software provisioning manager.

You must have already reserved the virtual host name (network name) and its IP address on a DNS server before you run the software provisioning manager. For more information, see Using Virtual Host Names [page 74].

**Note**

Fully qualified host names, IPv4, IPv6 are not accepted as virtual host names.

SAP Process Integration (PI) 7.5, SAP Solution Manager 7.2:

Java system on a host

If you want to install the primary application server instance of the different from the host of the primary application server instance of the ABAP system, then you must specify the host of the Java primary application server instance during the Define Parameters phase of the primary application server instance installation of the ABAP system.

This is to set up the connection between the ABAP and the Java system.

SAP System Profile Directory

```
\<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile
```

The software provisioning manager retrieves parameters from the SAP system profile directory of an existing SAP system.

SAP profiles are operating system files that contain instance configuration information.

The software provisioning manager prompts you to enter the location of the profile directory when the installation option that you execute is not the first one belonging to your SAP system installation, for example if you are installing a distributed system or an additional application server instance to an existing SAP system. See also the description of the parameters SAP System ID and Database ID.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destination drive</td>
<td>Base directory for the SAP system.</td>
</tr>
</tbody>
</table>

**Note**

If you install a subsequent SAP system, the saploc share already exists and you cannot select the installation drive. The software provisioning manager uses the installation drive where the saploc share points to.
### Parameter Description

- **Master Password**
  
  Common password for all users that are created during the installation:
  
  - Operating system users (for example `<sapsid>adm`, `<sapsid>SAPService`)
  
  **Caution**
  
  If you did not create the operating system users manually before the installation, the software provisioning manager creates them with the common master password (see Operating System Users). In this case, make sure that the master password meets the requirements of your operating system.
  
  - ABAP users: `SAP*`, `DDIC`, and `EARLYWATCH`.
  - Secure Store key phrase

  **SAP systems based on SAP NetWeaver 7.4 and Higher:** For more information, see line **Key Phrase for Secure Store Settings** and line **Individual Encryption Key for the Secure Storage** in this table.

  **Note**
  
  If a user already exists, you are prompted to confirm the password for this user.

### Basic Password policy

The master password must meet the following requirements:

- It can be 8 to 30 characters long
- It must contain at least one letter (a-z, A-Z)
- It must contain at least one digit (0-9)
- It must not contain `\` (backslash) or `"` (double quote).

**Additional restrictions depending on Windows:**

- If a user already exists, you are prompted to confirm the password for this user.
- Depending on the configuration of the password policy, additional restrictions might apply.

**Additional restrictions depending on SAP HANA database:**

- It must consist of at least one number, one lowercase letter, and one uppercase letter.
- It can only contain the following characters: `_ a-z A-Z 0-9 # @ $ !` and must not start with a number or an underscore (`_`).

Depending on the installation option, additional restrictions may apply.

### Recommendation

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

For more information, see Ensuring User Security [page 148].
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Server Access Control List</td>
<td>You can specify if you want to have a message server Access Control List (ACL) created. The ACL is created as a file in the <code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/global</code> directory. If it exists, it defines the hosts from which the message server accepts requests.</td>
</tr>
<tr>
<td></td>
<td>Only trigger the creation of this file if you do not plan to install any additional instances for this system. With the creation of this ACL, you overwrite existing settings and prevent instances from being installed on additional hosts. If you decide to install an additional instance later, you need to remove this file manually before the installation and create it again after the installation of the additional instance.</td>
</tr>
<tr>
<td></td>
<td>For more information, see the information about <code>ms/acl_info</code> in SAP Notes <a href="http://help.sap.com/nw75">1495075</a> and <a href="http://help.sap.com/nw75">826779</a>.</td>
</tr>
</tbody>
</table>
| SAP systems based on SAP NetWeaver 7.4 and Higher only: | You can set a randomly generated individual encryption key for the secure storage in the file system and the secure storage in the database. If you skip this step, the system is installed with a default key which provides obfuscation only, but it can be changed later.                                                                                       | **For more information on the secure storage in the file system, see the SAP Library - depending on the SAP NetWeaver release your SAP system is based on - at:** http://help.sap.com/nw74 http://help.sap.com/nw75 https://help.sap.com/nw751abap https://help.sap.com/nw752abap


- For more information on the secure storage in the database, see the SAP Library - depending on the SAP NetWeaver release your SAP system is based on - at:
  - http://help.sap.com/nw74
  - http://help.sap.com/nw75
  - https://help.sap.com/nw751abap
  - https://help.sap.com/nw752abap

### Parameter: DNS Domain Name for SAP System

If you want to use HTTP-based URL frameworks such as Web Dynpro applications, you have to specify the DNS domain name for the SAP system. The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter SAPLOCALHOSTFULL. FQDN is the fully qualified domain name for an IP address. It consists of the host name and the domain name:

\(<\text{Host}_\text{Name}>.\ <\text{Domain}_\text{Name}>\)

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

**Example**

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

### Parameter: SAP Host Agent Upgrade (Optional)

If there already exists an SAP Host Agent on the installation host, the software provisioning manager asks you if you want to upgrade it to a newer patch level version. If you want the existing version to be upgraded, you must provide the new target version of the SAPHOSTAGENT<Version>.SAR archive.

For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 89]

### Ports

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| ABAP Message Server Port   | **⚠️ Caution** The message server port number must be unique on the host where the message server for the SAP system is running. If there are several message servers running on one host, the message server ports must all be unique. If you do not specify a value, the default port number is used. **ABAP Message Server Port**

There is an external message server port and an internal message server port.

The ABAP message server uses both the internal and the external message server ports. The default profile contains the configuration for both message server ports.

The **external** message server port uses the parameter rdisp/msserv with default value 36<ABAP_Message_Server_Instance_Number>.

The **internal** message server port uses the parameter rdisp/msserv_internal with default value 39<ABAP_Message_Server_Instance_Number>.

During the installation of an SAP system from scratch or an additional application server instance to an existing SAP system, the message server is configured to only accept secure connections. The DEFAULT.PFL profile parameter system/secure_communication is set to ON (system/secure_communication = ON) if the kernel supports secure connections to the message server. For more information, see SAP Note 2040644. |
### Operating System Users

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Password of Operating System Users</strong></td>
<td>The passwords of the operating system users must comply with the Windows password policy. The software provisioning manager processes the passwords of operating system users as follows:</td>
</tr>
<tr>
<td></td>
<td>• If the operating system users do not exist, SAP creates the following users:</td>
</tr>
<tr>
<td></td>
<td>• <code>&lt;sapsid&gt;</code>adm</td>
</tr>
<tr>
<td></td>
<td>• <code>SAPService&lt;SAPSID&gt;</code></td>
</tr>
<tr>
<td></td>
<td>• <code>sapadm</code></td>
</tr>
<tr>
<td></td>
<td>If required, you can change this user to become a domain user on the Parameter Summary screen. For more information, see Performing a Domain Installation Without Being a Domain Administrator [page 169]. For security reasons, however, SAP strongly recommends you to create this user as a local user.</td>
</tr>
<tr>
<td></td>
<td>The software provisioning manager sets the master password for these users by default. You can overwrite and change the passwords either by using the parameter mode Custom or by changing them on the Parameter Summary screen.</td>
</tr>
<tr>
<td></td>
<td>• If the operating system users already exist, the software provisioning manager prompts you for the existing password, except the password of these users is the same as the master password.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
</tbody>
</table>

### Windows Domain Organizational Units

You can choose the organizational units (OUs) within the Windows domain where you want to create the SAP system accounts.

By default, the software provisioning manager creates the domain users `SAPService<SAPSID>`, `<sapsid>adm`, and the domain group `SAP_<SAPSID>_Globaladmin` in the domain Users container. Here you can specify an optional organizational unit where the software provisioning manager creates these domain users and group. The user who performs the installation needs read and write permissions to this organizational unit.

The OU feature is only available when you select Custom mode in SWPM and choose Use Domain of current user. For more information, see SAP Note 2247673.
## User Management Engine Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java Administrator User</td>
<td>The software provisioning manager creates this user in the ABAP system. After the installation, this user is available both in the ABAP and in the Java system. The software provisioning manager sets the user name J2EE_ADMIN and the master password by default. If required, you can choose another user name and password according to your requirements.</td>
</tr>
<tr>
<td>Java Guest User</td>
<td>This user is for employees who do not belong to a company or who have registered as company users and who are waiting for approval. Guest users belong to the default group Authenticated Users. The software provisioning manager creates this user in the ABAP system. After the installation, it is available both in the ABAP and in the Java system. The software provisioning manager sets the user name J2EE_GUEST and the master password by default. If required, you can choose another user name and password according to your requirements. For more information about supported UME data sources and change options, see SAP Note 718383.</td>
</tr>
<tr>
<td>Communication User</td>
<td>The software provisioning manager creates this user in the ABAP system. After the installation, it is available both in the ABAP and in the Java system. This user is used for the communication between the ABAP system and the Java system. The software provisioning manager sets the user name SAP-JSF and the master password by default. If required, you can choose another user name and password according to your requirements. For more information about supported UME data sources and change options, see SAP Note 718383.</td>
</tr>
</tbody>
</table>
**System Landscape Directory**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLD Destination for the System</td>
<td>The System Landscape Directory (SLD) registers the systems and the installed software of your entire system landscape. You can choose between the following options:</td>
</tr>
</tbody>
</table>
|                               | • **Register in existing SLD**  
  Choose this option to register the SAP system you are installing in an existing SAP System Landscape Directory (SLD) by specifying the SLD connection parameters listed below in this table.          |
|                               | • **No SLD destination**  
  Choose this option if you do not want to register the SAP system you are installing in an existing SAP System Landscape Directory (SLD). You then have to configure the SLD destination manually after the installation has finished. |
|                               | For more information, see Performing Post-Installation Steps for the ABAP Application Server [page 141]                                                                                                     |
| SLD Host                      | The host name of the existing SLD.                                                                                                                                                                         |
| SLD HTTP(S) Port              | HTTP port of the SAP system based on AS Java on which the System Landscape Directory (SLD) resides. The following naming convention applies:  
  5<Primary_Application_Server_Instance_Number>00.                                                                                              |
|                               | **Example**  
  If the primary application server instance number of the AS Java on which the System Landscape Directory (SLD) resides is 01, the SLD HTTP Port is 50100.                                                    |
| SLD Data Supplier User and password | The existing SLD Data Supplier user and password of the existing SLD                                                                                                                                    |
### 3.6.2 SAP System Database Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSTEM_ID</td>
<td>The SYSTEM_ID identifies the database instance. This is the result of the following query: &lt;br&gt;<strong>select SYSTEM_ID from M_DATABASE</strong>&lt;br&gt;If your SAP HANA SYSTEM_ID is the same as the chosen SAP System ID &lt;SAPSID&gt;, there are following restrictions:&lt;br&gt;• The ABAP system and SAP HANA database have to be installed on different hosts&lt;br&gt;• Database installation has to done on the ABAP host. Otherwise Database installation procedure with Software Provisioning Manager (the &quot;software provisioning manager&quot;) could overwrite the environment files (sapenv.* ) of the SAP HANA database and the database will not start any more after reboot.</td>
</tr>
<tr>
<td>DATABASE_NAME, Database ID</td>
<td>The &lt;DBSID&gt; identifies the tenant database. This is the result of the following query:&lt;br&gt;<strong>select DATABASE_NAME from M_DATABASE</strong>&lt;br&gt;If your database is a single database, then the DATABASE_NAME equals the SYSTEM_ID.&lt;br&gt;<strong>MCOD only:</strong> If you want to use an existing database system, enter exactly the Database ID of the existing SAP HANA database. For more information, see Installation of Multiple Components in One Database [page 172].</td>
</tr>
<tr>
<td>Database schema</td>
<td>The ABAP database schema is named SAP&lt;SCHEMA_ID&gt;. Default value: SAPABAP1. You can either accept this default or enter another value according to your needs.</td>
</tr>
</tbody>
</table>

→ **Recommendation**<br>Do not choose a value that contains the <SAPSID> of your system. Keep in mind that you cannot change the schema name retrospectively. Therefore, if you change the <SAPSID> by performing a system rename or a system copy, the schema name always remains the same as the original one you assigned during the installation.
**Parameters** | **Description**
--- | ---
Virtual Host Name | Virtual host name (network name) of the SAP cluster group.
You can assign virtual host names to the SAP HANA database instance by starting the software provisioning manager with the `SAPINST_USE_HOSTNAME` property. For more information, see Running Software Provisioning Manager [page 101].

After the installation has completed, all application servers can use this virtual host name to connect to the SAP HANA database instance. The virtual host name is also a global host name. If you do not provide the virtual host name, the instance is installed automatically using the physical host name of the host where you run the software provisioning manager.

You must have already reserved the virtual host name (network name) and its IP address on a DNS server before you run the software provisioning manager. For more information, see Using Virtual Host Names [page 74].

---

**i Note**

Fully qualified host names, IPv4, IPv6 are not accepted as virtual host names.

---

**Configuration of SAP liveCache with SAP HANA**

Select Install SAP liveCache for SAP System if you want to configure SAP liveCache for your SAP System. You need the SAP liveCache installation only when at least one of your applications uses it.

- Select Use SAP liveCache integrated in SAP HANA if you want your SAP liveCache in the SAP HANA database instance. To configure it, SAP liveCache integrated in SAP HANA (also called LCAPPS- or liveCache Applications plugin) must be pre-installed in an existing HANA database. For more information about how to install LCAPPS, see SAP Note 2979266. For more information about SAP liveCache on SAP HANA requirements, see the SAP HANA Master Guide at: http://help.sap.com/hana_platform.

- Select Use external SAP liveCache based on SAP MaxDB technology if you want to run SAP liveCache as a separate SAP MaxDB database instance. This is not supported with S/4 HANA installations.

For more information about SAP MaxDB liveCache Technology requirements, see the SAP MaxDB liveCache Technology installation guide at: https://help.sap.com/viewer/swpm10guides.
**Parameters** | **Description**
--- | ---
Database Monitor User | The database monitor user is named **DBACOCKPIT**. This name cannot be changed.

**DBACOCKPIT** is a dedicated database user to monitor and administer the local database.

For more information, see [https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/<Release> Search for “DBA Cockpit for SAP HANA”]

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

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

| Parameter | Description |
--- | --- |
When Using a Stack XML File: | When Installation Using a Stack XML File [page 38], in addition to the requirements listed in using a stack configuration file [page 50] General Parameters SAP System ID, make sure that the SAP system ID (SAPSID) of the ABAP system must be different from the SAPSID of the Java system. |
Parameter | Description
--- | ---
Communication Port for ABAP | For a secure communication of connected SAP systems to the ABAP stack you have to define the HTTPS port that is to be configured in the application server instance profile. Further post-installation steps (page 145) are required to fully enable HTTPS communication. For more information about HTTPS enablement, see SAP Note 510007.

In addition you can configure an HTTP port. However, this is not recommended for productive SAP systems due to security reasons.

→ Recommendation

If you are about to install an SAP NetWeaver 7.5 Process Integration system and you intend to run automated configuration using the Central Technical Configuration (CTC) Wizard after the installation, it is strongly recommended that you configure the ABAP communication port for ABAP already during the installation process, because you can only run the CTC Wizard if the ABAP port is either completely configured for HTTPS or optionally for HTTP. For more information, see PI: Configuring the Process Integration System After the Installation in Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.5 and SAP Solution Manager 7.2 SR2 Java on Windows: <Database>.

Application Server Gateway Communication Setup | If you want to install the primary application server instance of the Java system on a host different from the host of the primary application server instance of the ABAP system, then you must specify the host of the Java primary application server instance during the Define Parameters phase of the primary application server instance installation of the ABAP system.

This is to set up the connection between the ABAP and the Java system.
### 3.6.4 Additional Parameters When Using a Stack XML File

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAP Process Integration (PI) 7.5, SAP Solution Manager 7.2:</strong></td>
<td>In addition to the requirements listed in SAP System Parameters <a href="#">page 50</a> General Parameters SAP System ID, make sure that the SAP system ID (SAPSID) of the ABAP system must be different from the SAPSID of the Java system.</td>
</tr>
<tr>
<td>SAP System ID <code>&lt;SAPSID&gt;</code></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Domain</strong></td>
<td>The ABAP Transport Management System (TMS) must be configured before ABAP correction packages can be applied. You can also run the configuration or even reconfigure the TMS after the installation has finished. To be able to transport changes between the SAP systems in your system landscape, you need to configure the Transport Management System (TMS) for all SAP systems in your system landscape and configure one transport domain controller. To start the TMS in your ABAP system for later reconfiguration, call transaction STMS. At least one transport landscape with this system as transport domain controller is required before you can apply corrections, support packages, or upgrades to the SAP system. The name of the Transport Domain must not contain blank characters. You cannot change the name afterwards without reconfiguring the transport domain controller and thereby the entire Transport Domain. By default use <strong>DOMAIN_&lt;SAPSID&gt;</strong> for the Transport Domain of a single transport landscape with this system as transport domain controller.</td>
</tr>
<tr>
<td><strong>Directory with Transport Files</strong></td>
<td>Location of the ABAP transport files that are to be included after the ABAP load during the installation. All transport files in this directory are imported with the transport control program (<code>tp</code>).</td>
</tr>
<tr>
<td><strong>Location of SPAM/SAINT Update Archive</strong></td>
<td>A SPAM/SAINT update contains updates and improvements to the Support Package Manager (SPAM) and the Add-On Installation Tool (SAINT). Provide the full path to the SPAM/SAINT update archive. SPAM/SAINT is delivered with the ABAP load. SAP recommends that you always use the latest version of SPAM/SAINT before applying Support Packages.</td>
</tr>
</tbody>
</table>
Decide whether you want to prepare for the Software Update Manager run at the end of the installation

With the Software Update Manager (SUM), you can apply support packages stacks at the end of the installation.

- Do not start SUM automatically
- Start SUM automatically at the end of the installation

Choose to start SUM automatically, if you want to have the SUM STARTUP script called in the default `<Update Directory>/SUM/` directory at the end of the installation.

Extract the `SUM*.SAR` Archive

If you choose to extract the `SUM*.SAR` archive, the provided archive is validated and extracted to the default update directory:

Windows: `<Installation Drive>\usr\sap\<SAPSID>\`

SUM HTTP port

If you are running several SAP system updates on the same host, you have to use different port numbers for each update. You can adjust the default SUM HTTP port by entering the required port number in the SUM HTTP Port field. When doing so you set the SUM GUI Port number to (=`<HTTP port number+2>`). Dependencies See also the Software Update Manager documentation at: [https://support.sap.com/en/tools/software-logistics-tools/software-update-manager.html](https://support.sap.com/en/tools/software-logistics-tools/software-update-manager.html)

SUM Batch Input File

You can specify a batch file with some default values for the update. SUM then starts with parameter `batchfile=<XML file with input parameters>`.

Enter the full path to the existing batch file.

Placeholders like `@PARAMETER_VALUE@` inside the file are replaced by values known from the installation.

Install Additional SAP System Languages

A set of default languages is delivered with the ABAP load. From the language media delivered with your product version or - if already provided by the Maintenance Planner for the respective product - using language archives, you can select additional languages that you want to have installed during SAP system installation.

If you want to install additional languages, you must provide the directory with the additional language packages for the ABAP installation load, for example with subdirectories like `DATA_UNITS/ES`.

For more information, see Installation Using a Stack XML File (Optional) [page 38].

Related Information

Installation Using a Stack XML File [page 38]
3.6.5 Parameters for Additional Components to be Included in the ASCS Instance

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

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

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

**Related Information**

ASCS Instance with Embedded SAP Web Dispatcher [page 32]
ASCS Instance with Embedded Gateway [page 34]
3.7 SAP System Transport Host

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

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

- Use the transport directory that the software provisioning manager creates during the installation of the SAP system by default on the global host.
  The software provisioning manager by default creates the transport directory on the global host in \usr\sap\trans.
- Use a transport directory located on a host other than the default host:
  - You can use an existing transport directory and host in your SAP system landscape.
  - You can set up a new transport directory on a different host.
In either case, you must prepare this host for use by the new SAP system [page 75].

More Information

- SAP Directories [page 164]
- See the SAP Library at:

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP Library Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>[Application Help] ➤ [Function-Oriented View] ➤ [Solution Life Cycle Management] ➤ [Change and Transport System] ➤ [Software Logistics] ➤ [Change and Transport System – Overview] ➤ [Basics of the Change and Transport System] ➤ [Transport Management System – Concept]</td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td>[<a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a>]</td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td>[<a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a>]</td>
</tr>
<tr>
<td>SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td>[<a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a>]</td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td>[<a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a>]</td>
</tr>
</tbody>
</table>
4 Preparation

4.1 Preparation Checklist

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

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

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

Standard, Distributed, or High-Availability System

**Note**

In a standard system [page 28], all mandatory instances except the database instance are normally installed on one host. Therefore, if you are installing a standard system, you can ignore references to other hosts.

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

1. You make sure that the SAP HANA database is installed on the SAP HANA host [page 69].
2. You decide how to set connectivity data for your SAP HANA database [page 69].
3. Disable the Windows Server [page 70] firewall operating system users and groups on each host.
4. You perform basic preparations on Windows [page 71].
5. You check that you have the required user authorization for running the software provisioning manager [page 73].
6. If required, you prepare the SAP system transport host [page 75] for your SAP system.
7. You install the SAP front-end software [page 77] on the desktop of the user.
8. If required, you configure host names for the SAP HANA database [page 77].
9. To establish a secure connection to your SAP HANA, follow the instructions in Establishing Secure Connection to the SAP HANA Database [page 78].
10. You check that the required installation media [page 80] are available for each installation host.
11. Only valid for ‘High Availability’: HA (Windows)
    
    To install a high-availability system with Microsoft Failover Clustering, you also perform the HA-specific preparation steps [page 187].
12. You continue with Installation [page 97].
Additional Application Server Instance

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

1. Disable the Windows Server firewall [page 70] operating system users and groups on each host.
2. You perform basic preparations on Windows [page 71].
3. You check that you have the required user authorization for running the software provisioning manager [page 73].
4. If required, you prepare the SAP system transport host [page 75].
5. You install the SAP front-end software [page 77] on the desktop of the user.
6. You check the time zones of the ABAP application server and the SAP HANA system [page 80].
7. You check that the required installation media [page 80] are available on each installation host.
8. You continue with Installation [page 97].

4.2 Installing the SAP HANA Database

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

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

The SAP HANA database is normally part of the SAP HANA appliance. It is normally pre-installed by SAP partners before you start the installation using the software provisioning manager. The software provisioning manager accesses the SAP HANA database remotely to perform the necessary database-specific installation steps.

4.3 Setting Connectivity Data for the SAP HANA Database

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

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

- Local hdbuserstore container (default method)
  The local hdbuserstore container has always been available with SAP HANA. It is used in all versions of software provisioning manager. It is the default when you are doing an installation of SAP HANA or a migration to SAP HANA. One hdbuserstore is created for each host for which you installing an ABAP instance.
  The hdbuserstore is stored in the Windows registry. The hdbuserstore is used by the SAP kernel tools without further options and by SAP HANA client tools such as hdbsql using the option `-U <ENTRY>`.
  You can trace the connect method of R3trans by checking the log file trans.log.
The disadvantage of this method is that there is one hdbuserstore container on each SAP application server. This means that, if you want to change the connectivity data, you have to log on to each server of the system and change the data separately on each server. To use this method, you need take no further action since it is the default.

- If you want to use virtual host names, you must start the software provisioning manager with the SAPINST_USE_HOSTNAME parameter. For more information, see Running Software Provisioning Manager [page 101].

- ABAP secure storage in the file system (SSFS)
  ABAP SSFS is a database-independent method of storing data located inside the SAP system. For more information, see SAP Note 1639578. This functionality is available for SAP HANA as of SAP NetWeaver 7.4. To use this method, you start the installation with the parameter HDB_ABAP_SSFS=YES. For more information, see Running Software Provisioning Manager [page 101]. Note that only SAP kernel tools can read from ABAP SSFS. This means that SAP HANA client tools such as hdbsql cannot use ABAP SSFS. Therefore, you might want to choose one application server where you still maintain one hdbuserstore container.

### 4.4 Disabling the Windows Server Firewall on Windows Server

The Windows firewall – which is turned on by default on all Windows versions – is configured to allow only a small set of Windows-specific inbound IP connections. By default, outbound connections are not limited to rules and are therefore not restricted by the firewall.

The firewall settings apply to local policies. For domain policies that override local policies, other rules might apply.

To avoid any problems with non-configured TCP/IP ports that are used by the SAP system, you need to disable the firewall on all Windows hosts before you install the SAP system with the software provisioning manager. We recommend that you secure network access to the SAP application servers with a real physical firewall or use a router Access Control List (ACL).

**Procedure**

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a high-availability system, you have to disable the firewall on <strong>all</strong> failover cluster nodes.</td>
</tr>
</tbody>
</table>

Open PowerShell in elevated mode, and enter the following command:

```
Set-NetFirewallProfile -enabled false
```
4.5 Performing Basic Windows Preparation Steps

Use

This section informs you about basic preparation steps that you have to perform before you install the SAP system, including the following:

- Deactivate the file and directory attribute caches
- Checking the Windows file system
- Checking the Windows domain structure (domain installation only)
- Deciding whether you want to use organizational units (OUs) in the Windows domain (domain installation only)

Procedure

Deactivate the File and Directory Attribute Caches

You need to set the following three file and directory attribute caches to 0:

For more information, see 3358301.

Perform as follows:

1. Open PowerShell
2. Enter the following three commands:
   - Set-SmbClientConfiguration -FileInfoCacheLifetime 0
   - Set-SmbClientConfiguration -FileNotFoundCacheLifetime 0
   - Set-SmbClientConfiguration -DirectoryCacheLifetime 0

Checking the Windows File System

You need to check which Windows file system you are using on hosts where you want to install the SAP system.

You should use the Windows file system ReFs or NTFS. Older Windows Server versions must use NTFS.

**Note**

Do not install the SAP system on a FAT partition.

Perform the check as follows:

- Use PowerShell:
  1. Open PowerShell in elevated mode, and enter the following command:
     ```powershell
     get-volume
     ```
  2. Check that the value **FileSystem** is ReFs or NTFS.
- Use Windows Explorer:
  1. Open the Windows Explorer.
  2. Select the relevant disk.
3. Choose Properties > General. The system displays the type of file system in use.
4. Check that the file system is NTFS.

**Checking the Windows Domain Structure**

*Note* You do not need this step for a local installation.

For a domain installation, we recommend that you check that all SAP system hosts are members of a single Windows domain. We recommend this for all SAP system setups.

We assume that you are familiar with checking Windows domain structures. For more information, see the Windows documentation.

In Windows, you can implement either of the following domain models for the SAP system:

- **Extra domain**
  In this model, the SAP system is embedded in its own domain, which is specially defined for SAP. A second domain exists for the user accounts.
  In Windows, the SAP domain and user domain must be incorporated in a domain tree. In this tree, the user accounts must form the root domain and the SAP domain must be a child domain of this.

- **Single domain**
  In this model, the SAP system, and the user accounts are included in a single domain.

*Caution* You cannot create local users and groups on the host that is used as domain controller. Therefore, we do not support running an SAP instance (including the database instance) on the host where the domain controller is installed.

**Deciding Whether to Use Organizational Units (OUs) in the Windows Domain**

*Note* You do not need this step for a local installation.

For a domain installation, the software provisioning manager needs to create certain OS users for SAP and database operations in the Windows domain, also called the “Active Directory” (AD). These users are created by default in the AD container “Users”.

Depending on a customer’s AD landscape and security policy, there are certain restrictions on where to store users and groups in AD. Contact the administrator of your AD infrastructure to understand where to store all SAP and database-related domain users and domain groups.

The SAP software provisioning manager offers to define an existing OU in AD to create all needed SAP and database users in this OU.

There are many different scenarios and prerequisites concerning how to use OUs. For more information, see SAP Note 2247673, which explains these issues in detail and shows some examples of how to use them.
**4.6 Required User Authorization for Running Software Provisioning Manager**

Although the software provisioning manager automatically grants the rights required for the installation to the user account used for the installation, you have to check whether this account has the required authorization to perform the installation. The authorization required depends on whether you intend to perform a *domain* or *local* installation. If necessary, you have to ask the system administrator to grant the account the necessary authorization before you start the installation. If you attempt the installation with an account that does not have the required authorization, the installation aborts.

This section informs you about the authorization required for a domain and a local installation.

**Procedure**

**Caution**

Do *not* use the user `<sapsid>adm` or the built-in administrator account for the installation of the SAP system.

**Domain Installation**

For a domain installation the account used for the installation needs to be a member of the local *Administrators* group. In many old installation guides, you find the information that the account must be a member of the *Domain Admins* group. The account can be either a member of the *Domain Admins* group or belong to the *Domain Users* group and have the necessary rights to create/modify objects in the domain.

For a list of the required permissions, see Performing a Domain Installation without being a Domain Administrator [page 169].

All machines in the system must belong to the same domain. In a domain installation, the user information is stored centrally on the domain controller and is accessible to all hosts in the system.

If the SAP system is to be distributed across more than one machine, SAP strongly recommends that you perform a domain installation to avoid authorization problems.

**Caution**

- If you install a distributed system as a local installation, this can lead to authorization problems for the operating system users `<sapsid>adm` and `SAPService<SAPSID>`. It can also lead to problems...
with the transport directory, which is usually shared by several SAP systems. SAP does not support distributed SAP systems running with local user accounts.

- Only valid for "High Availability": HA (Windows)
  In a high-availability configuration, you always have to perform a domain installation.
- For performance and security reasons, SAP does not support an SAP system installation on a domain controller.

Local Installation

For a local installation the account used for the installation needs to be a member of the local Administrators group of the machine involved. In a local installation, all Windows account information is stored locally on one host and is not visible to any other hosts in the system.

⚠️ Caution

Do not use the Windows built-in account Administrator or the renamed built-in account to install your SAP system. The built-in account only has restricted network access rights that are required by the software provisioning manager. If you renamed the built-in account Administrator, do not create a new account named Administrator.

For a local installation, you need to:

1. Check that the account used for the installation is a member of the local Administrators group.
2. If required, obtain these rights by asking the system administrator to enter the account as a member of the local Administrators group.

Related Information

Performing a Domain Installation Without Being a Domain Administrator [page 169]

4.7 Using Virtual Host Names

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

Prerequisites

- Make sure that the virtual host name can be correctly resolved in your Domain Name System (DNS) setup.
- Make sure that you configured the Windows operating system properly to use virtual host names. For more information, see SAP Note 1564275.
Context

Only valid for ‘High Availability’: HA (Windows)

⚠️ Caution

High Availability only:

• Only use virtual host names if this is explicitly stated in the parts of this installation guide specific to high availability. Otherwise, use the physical host name.
• Do not start the software provisioning manager with the command line parameter SAPINST_USE_HOSTNAME=<virtual hostname> on failover cluster nodes.

End of ‘High Availability’: HA (Windows)

Procedure

1. Assign the required virtual host names to the instance to be installed by specifying them in one of the following ways:
   • By starting the software provisioning manager with the SAPINST_USE_HOSTNAME property. For more information, see Running Software Provisioning Manager [page 101].
   • Alternatively by specifying virtual host names in the <Instance Name> Host Name field of the <Instance Name> Instance screen.

For more information, see the Virtual Host Name parameter description in SAP System Parameters [page 50] and SAP Note 962955.

2. To install a non-high-availability system, proceed as described in SAP Note 1564275.

4.8 Preparing the SAP System Transport Host

The transport host has a directory structure that is used by the SAP transport system to store transport data and metadata.

Context

When you install an SAP system, the software provisioning manager by default creates the transport directory on the global host in \usr\sap\trans.

If you do not intend to use the directory structure of the system you are going to install, but want to use another new transport directory on another host, or an existing transport directory in your system landscape, you need to prepare that transport host:
• If the directory structure already exists, you must set up its security to allow the new system to write to it.
If it does not yet exist, you must create the core directory structure and a share to export it for other computers as well as set the security on it.

The transport directory \usr\sap\trans is used by the Change and Transport System (CTS). The CTS helps you to organize development projects in the ABAP Workbench and in Customizing, and then transport the changes between the SAP systems in your system landscape. For more information, see the SAP Library at:

### SAP Release and SAP Library Quick Link

- SAP NetWeaver 7.3 including Enhancement Package 1
- SAP NetWeaver 7.4  
- SAP NetWeaver 7.5  
- SAP NetWeaver Application Server for ABAP 7.51 innovation package  
- SAP NetWeaver AS for ABAP 7.52  

### SAP Library Path (Continued)


### Procedure

1. If the transport directory does not yet exist, do the following:
   a. Create the directory \usr\sap\trans on the host to be used as the transport host.
   b. Share the \usr\sap directory on the transport host as SAPMNT and set the permission for Everyone to Full Control for this share.
      This enables the software provisioning manager to address the transport directory in the standard way as \\SAPTRANSHOST\SAPMNT\trans.

2. Grant Everyone the permission Full Control for the transport directory.

⚠️ **Caution**

Remove the Full Control to Everyone permission after you have finished the installation and only grant Full Control on this directory to the SAP_<SAPSID>__GlobalAdmin groups of all the systems that are part of your transport infrastructure. The software provisioning manager assigns the appropriate rights with the help of an additional SAP_LocalAdmin group. For more information, see Automatic Creation of Accounts and Groups [page 180].
4.9 Installing the SAP Front-End Software

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

Procedure

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

4.10 Configuring Host Names for the SAP HANA Database

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

Context

During the Define Parameters phase, the software provisioning manager prompts you for the parameters to connect to your SAP HANA database. However, the database host name that you enter is not used for the user store. Instead, the external host name of the database is determined and subsequently used. If the SAP HANA database was installed using a virtual host name and you want this host to be used in the user store connection environment, make sure the host can be resolved from the installation host as well.

Procedure

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

For more information on how to do this, see SAP Note 1930853 or section Mapping Host Names for Database Client Access in the SAP HANA Administration Guide, available here:

https://help.sap.com/viewer/p/SAP_HANA_PLATFORM Administration
4.11 Establishing Secure Connection to the SAP HANA Database

You can establish a secure connection to the SAP HANA database. You can accomplish this in one of the following ways:

- Use the software provisioning manager to configure the SAP system instances to use the Transport Layer Secure (TLS)/Secure Sockets Layer (SSL) protocol to secure connections of to the SAP HANA database.
- Configuring your SAP HANA database to force all clients to use a secured connection and to validate all client connection.

Prerequisites

For enabling SAP HANA SSL, at least SAP HANA Client 2.0 SPS04 is required. For more information, see SAP Note 2784500.

Applying Self-signed Certificates while Running the Software Provisioning Manager [page 78]

The software provisioning manager can configure the SAP system instances to use the Transport Layer Secure (TLS)/Secure Sockets Layer (SSL) protocol to secure connections of to the SAP HANA database. Self-signed certificates are generated to setup the secure environment for your system using the SAP Cryptographic Library CommonCryptoLib.

Configuring SAP HANA Encryption Parameters [page 79]

Depending on how you have specified parameter sslEnforce, the software provisioning manager will configure the connection of the SAP system instances to the SAP HANA database.

4.11.1 Applying Self-signed Certificates while Running the Software Provisioning Manager

The software provisioning manager can configure the SAP system instances to use the Transport Layer Secure (TLS)/Secure Sockets Layer (SSL) protocol to secure connections of to the SAP HANA database. Self-signed certificates are generated to setup the secure environment for your system using the SAP Cryptographic Library CommonCryptoLib.

Context

If you want to secure your SAP system database connection to the SAP HANA database, TLS/SSL must be configured on both server and client side.

For more information, see section Configuring Clients for Secure Connections in the documentation SAP HANA Client Interface Programming Reference.
Procedure

On the Database for SAP System screen, select checkbox Connect using SSL and enter the required encryption parameters when requested by the software provisioning manager. For more information, see SAP Note 2891130.

4.11.2 Configuring SAP HANA Encryption Parameters

Depending on how you have specified parameter sslEnforce, the software provisioning manager will configure the connection of the SAP system instances to the SAP HANA database.

Context

Due to enhanced security standards, you can set up your SAP HANA database using parameter sslEnforce in a way that SAP system instances are only allowed to access it using secured and encrypted connections.

For more information, see the information about parameter sslEnforce in section Enforced TLS/SSL for Client Connections in the SAP HANA Security Guide at: https://help.sap.com/viewer/p/SAP_HANA_PLATFORM

Procedure

1. Start the SAP HANA Database Studio as described in the SAP HANA Administration Guide at: https://help.sap.com/viewer/p/SAP_HANA_PLATFORM
2. If not yet done, add your SAP HANA database system.
3. Log on as user SYSTEM.
4. Choose Configuration
5. Filter for the sslEnforce parameter and change the value according to your requirements. Default is false.
4.12 Checking Time Zones

Before you start the software provisioning manager, you need to check time zone settings.

Context

Before you start the software provisioning manager, compare the following time zone settings:

• The time zone of the target host for the ABAP application server
• The time zone of the \(<}\text{sid}\>\text{adm}\) user of the SAP HANA system

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

Procedure

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

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

For more information, see https://help.sap.com/viewer/p/SAP_HANA_PLATFORM # Installation and Upgrade > SAP HANA Server Installation and Update Guide

4.13 Preparing the Installation Media

This section describes how to prepare the installation media.

Installation media are available as follows:

• The software provisioning manager 1.0 archive containing the software provisioning manager software
  You always have to download the latest version of the software provisioning manager 1.0 archive.
  For more information, see Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87].
• The media containing the software to be installed. These are the following:
  • Kernel media:
    You can make them available in one of the following ways:
    • Make yourself familiar with current SAP Kernel releases and SAP’s Kernel strategy:
      Central SAP Notes
      2083594 - SAP Kernel Versions and SAP Kernel Patch Levels
      3116151 - SP Stack Kernel Schedule Forecast
The white paper **Update Strategy for the Kernel of the Application Server ABAP in On Premise Landscapes** provides SAP recommendations on how to patch the SAP kernel.

- **Download the SAP Kernel Archives** (SAR files) from the SAP Software Download Center - this is the recommended way. For more information, see **Downloading SAP Kernel Archives (Archive-Based Installation)** [page 89].
  
  If you are performing an **Installation Using a Stack XML File** [page 38], you can directly download the artefacts (SAR archives) as specified in the Maintenance Plan.

- **Use the physical installation media as part of the installation package.** For more information, see **Media Required for the Installation - Listed by SAP System Instance** [page 81].

- **Download the complete kernel media from the SAP Software Download Center.** For more information, see **Downloading Complete Installation Media** [page 94].

- **RDBMS and export media.** You can make them available in one of the following ways:
  
  - **Use the physical installation media as part of the installation package.**
  
  - **Download the complete kernel media from the SAP Software Download Center.**

For detailed information about how to obtain these media, see **Media Required for the Installation - Listed by SAP System Instance** [page 81].

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

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

The digital signature of installation media is checked **automatically** by the software provisioning manager during the **Define Parameters** phase while the **Media Browser** screens are processed (see also **Running Software Provisioning Manager** [page 101]). The software provisioning manager only accepts media whose digital signature has been checked.

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

**Central SAP Notes**
The white paper Update Strategy for the Kernel of the Application Server ABAP in On Premise Landscapes provides SAP recommendations on how to patch the SAP kernel.

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

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

Proceed as follows to make the media available:

1. Identify the required media for your installation [page 28] as listed below.

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required Software Packages from Installation Media</th>
</tr>
</thead>
</table>
| ABAP Central services instance (ASCS instance) | • Software Provisioning Manager 1.0 archive  
• UC or NUC Kernel (folder K_<Version>_N or U_<OS>) where U means Unicode and N means non-Unicode. |

**Note**

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

#### Required Software Packages from Installation Media

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required Software Packages from Installation Media</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Database instance</strong></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>
</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.

• Database client software
  For enabling SAP HANA SSL, at least SAP HANA Client 2.0 SPS04 is required. For more information, see SAP Note 2784500.

• Installation Export (folders EXP*)

**Note**

If you want to use SAP liveCache on SAP HANA, you must install the LCAPPS package on the database server. For more information, see the SAP MaxDB Administration Guide at https://help.sap.com/maxdb and SAP Note 2979266.

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

**i 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.

- Installation Export (folders EXP*)  
- **SAP SCM only:** SAP MaxDB liveCache

**i Note**
If you want to use SAP liveCache on SAP HANA, you must install the LCAPPS package on the database server. For more information, see the SAP MaxDB Administration Guide at [https://help.sap.com/maxdb](https://help.sap.com/maxdb) and SAP Note 2979266.

<table>
<thead>
<tr>
<th>Additional application server instance</th>
<th>Required Software Packages from Installation Media</th>
</tr>
</thead>
</table>
| - Software Provisioning Manager 1.0 archive  
- UC or NUC Kernel (folder K_<Version>_N or U_<OS>) where U means Unicode and N means non-Unicode. |

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

- **SAP SCM only:** SAP MaxDB liveCache

**i Note**
If you want to use SAP liveCache on SAP HANA, you must install the LCAPPS package on the database server. For more information, see the SAP MaxDB Administration Guide at [https://help.sap.com/maxdb](https://help.sap.com/maxdb).

**SAP Host Agent (Separate Installation Only)**

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required Media</th>
</tr>
</thead>
</table>
| SAP Host Agent (separate installation only) | - Software provisioning manager 1.0 archive  
- UC Kernel (folder K_<Version>_U_<OS>) where U means Unicode. |
2. Make the installation media available on each installation host as follows:
   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 87].
   2. Use the SAP HANA database client revision matching your HANA database. You can find the correct database client here:

   https://launchpad.support.sap.com/#/softwarecenter/Support Packages and Patches
   Software Downloads > Support Packages & Patches > By Alphabetical Index (A-Z) > H > SAP HANA PLATFORM EDITION > SAP HANA PLATFORM EDIT. 1.0 > Entry by Component > HANA client > SAP HANA CLIENT 1.00 > <Application_Server_OS>

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

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

3. Make the kernel media available.

   You can do this in one of the following ways:
   - Download the dedicated kernel archives - this is the recommended way. For more information, see Downloading SAP Kernel Archives (Archive-Based Installation) [page 89].
   - Use the physical kernel medium from the installation package.
     - Copy the required media folders directly to the installation hosts.
     - Mount the media on a central media server that can be accessed from the installation hosts.

   **Caution**
   - If you copy the media to disk, make sure that the paths to the destination location of the copied media do not contain any blanks.
   - If you perform a domain installation and do not want to copy the media but use network drives for mapping the installation media, make sure that the <sapsid>adm user has access to the UNC paths of the network drives. If the user does not yet exist, you have to create the user manually before you install the SAP system.
   - Download the kernel medium from the Software Download Center. For more information, see Downloading Complete Installation Media [page 94].
**Note**

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

For example: The software provisioning manager might require a certain PL of `<x>` of the `SAPEXEDB.SAR` (for DBTYPE `<y>`), but this PL of the `SAPEXEDB.SAR` is not contained in the SAP kernel media. In this case you have to download the required PL from https://launchpad.support.sap.com/#/softwarecenter following the instructions in Downloading SAP Kernel Archives (Archive-Based Installation) [page 89].

**Note**

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

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

**Caution**

- If you copy the media to disk, make sure that the paths to the destination location of the copied media do not contain any blanks.
- If you perform a domain installation and do not want to copy the media but use network drives for mapping the installation media, make sure that the `<sapsid>adm` user has access to the UNC paths of the network drives.
  If the user does not yet exist, you have to create the user manually before you install the SAP system.

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

**Related Information**

- Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87]
- Downloading SAP Kernel Archives (Archive-Based Installation) [page 89]
- Downloading Software Packages for a Maintenance Planner Transaction [page 92]
- Downloading Complete Installation Media [page 94]
4.13.1.1 Downloading and Extracting the Software Provisioning Manager 1.0 Archive

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

Prerequisites

- Make sure that you use the latest version of the SAPCAR tool when manually extracting the software provisioning manager archive. You need the SAPCAR tool to be able to unpack and verify software component archives (*.SAR files). *.SAR is the format of software lifecycle media and tools that you can download from the SAP Software Download Center.

**Note**

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

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

1. Go to https://launchpad.support.sap.com/#/softwarecenter

2. Select the SAPCAR for your operating system and download it to an empty directory.

3. Even if you have the latest SAPCAR already available, we strongly recommend that you verify its digital signature anyway, unless you downloaded it directly from https://launchpad.support.sap.com/#/softwarecenter/ yourself. You can do this by verifying the checksum of the downloaded SAPCAR tool:
   1. Depending on what operating system you are using, compute a hash of the downloaded SAPCAR tool, using the SHA-256 algorithm used by SAP .
   2. Now verify the digital signature of the downloaded SAPCAR tool by comparing the hash with the checksum (generated by SAP using the SHA-256 algorithm) from the Content Info button in the Related Info column on the right-hand side of the place where you downloaded the SAPCAR tool.

4. To improve usability, we recommend that you rename the executable to sapcar.

For more information about SAPCAR, see SAP Note 212876.

Context

An up-to-date version of the load tools - such as R3load, R3szchk, R3ldctl, SAPuptool - which were available so far only in the SAPEXEDB_<...>.SAR archive of the kernel media, has now been made available in the software provisioning manager archive (software provisioning manager10SP<Support_Package_Number>_<Version_Number>.SAR), in a sub-archive named LOADTOOLS.SAR, located in the COMMON/LOADTOOLS folder. For an installation using kernel version 740 or higher, the load tools from the software provisioning manager10SP<Support_Package_Number>_<Version_Number>.SAR are used automatically instead.
of the loadtools available in the SAPEXEDB<...>.SAR archive of the kernel media. **There is no action required from your side**, the software provisioning manager uses the relevant loadtools automatically once you run it from the extracted software provisioning manager10SP<Support_Package_Number>_<Version_Number>.SAR archive. For more information, see SAP Note 2472835.

**Procedure**

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

2. Using the latest version of SAPCAR, you can verify the digital signature of the downloaded SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive as follows:
   a. Get the latest version of the SAPCRYPTOLIB archive to your installation host as follows:
      1. Go to https://launchpad.support.sap.com/#/softwarecenter SUPPORT PACKAGES & PATCHES and search for “sapcryptolib”.
      2. Select the archive file for your operating system and download it to the same directory where you have put the SAPCAR executable.
      3. Use the following command to extract the SAPCRYPTOLIB archive to the same directory where you have put the SAPCAR executable:
         
         SAPCAR -xvf sapcryptolibp_84...sar -R <target directory>
      4. Download the Certificate Revocation List from https://tcs.mysap.com/crl/crlbag.p7s and move it to the same directory.
   b. Verify the digital signature of the downloaded SWPM10SP<Support_Package_Number>_<Version_Number>.SAR archive by executing the following command:

   ```
   Note
   Check SAP Notes 2178665 and 1680045 whether additional information is available.
   ```

   ```
   <Path to SAPCAR>\sapcar.exe -tvVf<Path to Download Directory>\SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -crl <file name of revocation list>
   ```

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

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

   ```
   <Path to SAPCAR>\sapcar.exe -xvf <Path to Download Directory>\SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -R <Path to Unpack Directory>
   ```
4.13.1.2 Downloading SAP Kernel Archives (Archive-Based Installation)

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

**i Note**

If you are performing an installation using a Stack XML file, you can use the service Downloading Software Packages for a Maintenance Planner Transaction [page 92].

**Context**

The digital signature of installation archives is checked automatically by the software provisioning manager [page 101] during the Define Parameters phase while processing the Software Package Browser screens. The software provisioning manager only accepts archives whose digital signature has been checked. After scanning the archives and verifying the digital signature, an info file is written where you can find detailed information about matching and non-matching archive files. You can access this info file by choosing the info file link in the Archive Scanning Result section of the Software Package Browser screen. The info file contains only the results of the latest archive scan.

**Procedure**

1. Download and unpack the latest version of software provisioning manager as described in Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87].
2. Make yourself familiar with current SAP Kernel releases and SAP’s Kernel strategy:

   **Central SAP Notes**
   - 2083594 - SAP Kernel Versions and SAP Kernel Patch Levels
   - 3116151 - SP Stack Kernel Schedule Forecast
   - 1744209 - SAP Kernel 720, 721 and 722: Versions and Kernel Patch Levels
   - 1969546 - Release Roadmap for Kernel 74x and 75x
   - 1802333 - Finding information about regressions in the SAP kernel
19466 📌 - Downloading SAP kernel patches

2966761 📌 - Overview of SAP Kernel Correction Archives

2966621 📌 - Overview of Kernel-Related Software Components

953653 📌 - Rolling Kernel Switch

The white paper Update Strategy for the Kernel of the Application Server ABAP in On Premise Landscapes provides SAP recommendations on how to patch the SAP kernel.

3. To get all downloadable software component archives required for your SAP product, go to
https://launchpad.support.sap.com/#/softwarecenter

You can also search for dedicated software component archives by choosing
SUPPORT PACKAGES & PATCHES & By Category

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

5. Choose the required package:

   i Note
   If you perform an additional application server installation, kernel archives
   - such as SAPEXE<Version>.SAR, SAPEXEDB<Version>.SAR, IGSEXE<Version>.SAR.
Caution

• Make sure that you always use the highest available patch level unless special patch levels are specified for the relevant package in SAP Note 1680045.

• Make sure that you always choose SAPEXE<Version>.SAR, SAPRXEDB<Version>.SAR of the same SAP kernel release and extension.

Example

If SAPEXE<Version>.SAR is of version 64-BIT UNICODE, then SAPRXEDB<Version>.SAR must also be of version 64-BIT UNICODE.

• SAPEXE<Version>.SAR
  * SAP KERNEL <Version> <UC> <DATABASE INDEPENDENT> *
  * SAPEXEDB<Version>.SAR *
  
  Choose the version corresponding to the SAPEXE<Version>.SAR from SAP KERNEL <Version> <UC> <<Operating System> <<DATABASE> *

• igsexehelper<Version>.sar
  * SAP IGS <Version> <<Operating System> *
  
  You require the igshelper<Version>.sar.

• SAP<Version>.SAR
  * SAP HOST AGENT 7.22 <<Operating System> *

  Recommendation

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

Note

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

6. If you want to install an SAP system based on SAP NetWeaver 7.3 EHP1 - that is you have to use SAP kernel 7.22 - download the latest patch level of SAPCRYPTOLIB <Version>.SAR from the following path:

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

7. Make the RDBMS and the export media available - either by using physical media as described in Media Required for the Installation - Listed by SAP System Instance [page 81] or by downloading them as described in Downloading Complete Installation Media [page 94].
Related Information

Downloading Software Packages for a Maintenance Planner Transaction [page 92]

4.13.1.3 Downloading Software Packages for a Maintenance Planner Transaction

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

**i Note**

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

Prerequisites

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

Procedure

1. Specify a download directory for the artifacts (SAP archives) to be downloaded.
2. Start the software provisioning manager as described in Running Software Provisioning Manager [page 101].
3. On the **Welcome** screen, choose ➤ **Generic Options** ➤ **Download Software Packages for Maintenance Planner Transaction**
4. Follow the instructions on the software provisioning manager screens.

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

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

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

- Your S-User ID and password

You call Software Provisioning Manager with command line parameter `SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>` to get the Maintenance Planner Transaction ID extracted from the Stack XML file.

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

Ensure the following for your S-User:

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


3. Location of download folder for the installation software packages to be downloaded
4. If you have a proxy configured in your network, provide the proxy host and port.

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

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

6. Choose Next to start the download.

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

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

You have downloaded the artifacts (SAP archives) required for your SAP system installation with the software provisioning manager - corresponding to the archives listed in section Downloading SAP Kernel Archives (Archive-Based Installation) [page 89] - and for applying the required kernel and support packages using Software Update Manager (SUM) after the installation has completed.

SAP BW/4HANA 1.0 SR1 only: RDBMS and export media are not covered by this feature. You have to provide them either as physical media or download them from the SAP Software Center as described in Downloading Complete Installation Media [page 94].

4.13.1.4 Downloading Complete Installation Media

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

Procedure

1. Download and unpack the latest version of Software Provisioning Manager as described in Downloading and Extracting the Software Provisioning Manager 1.0 Archive [page 87].
2. Create a download directory on the host where you want to run the software provisioning manager.
3. Identify the required media as listed in Media Required for the Installation - Listed by SAP System Instance [page 81].
4. Identify all download objects that belong to one medium according to one of the following:

   • Download path or location:
     • To download the complete kernel media, go to https://launchpad.support.sap.com/#/softwarecenter/SUPPORT PACKAGES & PATCHES By Category ADDITIONAL COMPONENTS SAP KERNEL SAP KERNEL 64-BIT UNICODE SAP KERNEL <Version> 64-BIT UNICODE <Select your OS>.
     • Select #DATABASE INDEPENDENT to download the database-independent parts of the kernel.

   Example

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

   SAPEXE_1118-80002612.SAR

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

You can only download complete kernel media for kernel release 7.22, which can only be used for provisioning of SAP products based on SAP NetWeaver 7.3 EHP1. For all remaining SAP products, you have to download kernel media from [https://launchpad.support.sap.com/#/softwarecenter/](https://launchpad.support.sap.com/#/softwarecenter/) as described in Downloading SAP Kernel Archives (Archive-Based Installation) [page 89].

- To download the remaining media required for your SAP product, you can use one of the following navigation paths:
  - [https://launchpad.support.sap.com/#/softwarecenter](https://launchpad.support.sap.com/#/softwarecenter) > INSTALLATIONS & UPGRADES > By Category > SAP NETWEAVER AND COMPLEMENTARY PRODUCTS > <Product> > <Product Release>

- Material number

All download objects that are part of an installation medium have the same material number and an individual sequence number:

<Kernelpart>_<Sequence Number>-<Material Number>

**Example**

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

**Example**

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

- Title

All objects that are part of an installation medium have the same title, such as

<Solution><Media_Name><OS> or <Database>RDBMS<OS> for database media.

5. Download the objects to the download directory.
6. To correctly re-combine the media that are split into small parts, unpack all parts into the same directory.
In the unpacking directory, the system creates a subdirectory with a short text describing the medium and copies the data into it. The data is now all in the correct directory, the same as on the medium that was physically produced. For more information, see SAP Note [1258173](https://support.sap.com/).

⚠️ Caution

Make sure that you unpack each installation media to a separate folder. Do not unpack installation media to the same folder where you unpack the Software Provisioning Manager archive. Do not unpack installation media to the same folder where you unpack the SAP kernel archives for archive-based installation.
5 Installation

5.1 Installation Checklist

This section includes the installation steps for the following:

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

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

**i Note**

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

On the Database for SAP System screen, enter the Database Host and the Instance Number for your SAP HANA database host. If the instance does not exist, a new SAP HANA database instance will be installed on the same host as the SAP system.

---

**Standard System**

1. You check the prerequisites [page 99] and run the software provisioning manager [page 101] to install the SAP system.

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

2. You continue with Post-Installation [page 122].

**Distributed System**

1. On the ASCS instance host, you check the prerequisites [page 99] and run the software provisioning manager [page 101] to install the ABAP central services instance.
If you want to install an ASCS instance with embedded SAP Web Dispatcher [page 32] or with embedded SAP Gateway [page 34] or both, you must choose the Custom parameter mode.

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

2. On the primary application server instance host, you check the prerequisites [page 99] and run the software provisioning manager [page 101] to install the contents of the database instance.

3. On the primary application server instance host, you check the prerequisites [page 99] and run the software provisioning manager [page 101] to install the primary application server instance.

4. If required, you install 1 to <N> additional application server instances on the respective hosts, as described later in this section.

5. You continue with Post-Installation [page 122].

---

**High-Availability System**

1. To install a high-availability system with Microsoft Failover Clustering, you perform the HA-specific installation steps [page 187].

2. You continue with Post-Installation [page 122].

---

**Additional Application Server Instance**

You perform the following steps on each host where you install the additional application server instances.

1. You check the prerequisites [page 99] and run the software provisioning manager [page 101] to install the additional application server instances.

---

**Caution**

In a high-availability system, you must install at least one additional application server instance.

---

2. You continue with Post-Installation [page 122].
5.2 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 47].

Procedure

Using Central User Management

1. You install your SAP system as described in this installation guide.
2. Add the system to Central User Administration (CUA). For more information, see Configuring User Management [page 147].

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 147].

5.3 Prerequisites for Running Software Provisioning Manager

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

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

⚠️ Caution

The software provisioning manager uses a self-signed certificate, which is used temporarily only while the software provisioning manager is running. This certificate is not trusted by the browser unless it is imported manually by the user running the software provisioning manager. This behavior is intentionally designed in this way because - unlike ordinary public web servers - the software provisioning manager has different usage patterns. You must configure your browser to trust the self-issued certificate of the software provisioning manager after carefully performing the “thumbprint” verification described in Running Software Provisioning Manager [page 101]. For more information about adding trusted certificates, see the documentation of your browser.

For more information about the SL-UI, see Useful Information about Software Provisioning Manager [page 108].

• If you want to enable Internet Protocol Version 6 (IPv6), make sure that you set `SAP_IPv6_ACTIVE=1` in the environment of the user with the required authorization [page 73] to run the software provisioning manager. While running the software provisioning manager, this setting is then also added to the environment of the `<sapsid>adm` user.

⚠️ Caution

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

• You need at least 700 MB of free space in the installation directory for each installation option. In addition, you need 700 MB free space for the software provisioning manager executables. The software provisioning manager creates an installation directory `sapinst_instdir`, where it keeps its log files, and which is located directly in the `%ProgramFiles%` directory. For more information, see Useful Information about Software Provisioning Manager [page 108].

• Make sure that you have defined the most important SAP system parameters as described in Basic Installation Parameters [page 48] before you start the installation.

• Check that your installation host meets the requirements for the installation options that you want to install.

For more information, see Running the Prerequisite Checker [page 42].

• Make sure that the database is up and running before starting the installation.

• If you want to install an additional application server instance in an existing SAP system, make sure that:
  • The service definitions for the SAP start services are configured correctly and refer to the correct profile files.
  • There are no profile backup files with an underscore “_” in their profile name. If so, replace the “_” with a “.”.

💡 Example

Rename `<Drive>:\usr\sap\S14\SYS\profile\S14_D20_wsi6408_12` to `<Drive>:\usr\sap\S14\SYS\profile\S14_DVEBMGS20_wsi6408.12`.

• Make sure that the following ports are not used by other processes:
  • Port 4237 is used by default as HTTPS port for communication between the software provisioning manager and the SL-UI.
If this port cannot be used, you can assign a free port number by executing sapinst.exe with the following command line parameter:

```
SAPINST_HTTPS_PORT=<Free Port Number>
```

• Port 4239 is used by default for displaying the feedback evaluation form at the end of the software provisioning manager processing. The filled-out evaluation form is then sent to SAP using HTTPS.

If this port cannot be used, you can assign a free port number by executing sapinst.exe with the following command line parameter:

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

• If you want to perform the installation in unattended mode, see System Provisioning Using an Input Parameter File [page 109] which describes an improved procedure using inifile.params.

### 5.4 Running Software Provisioning Manager

This section describes how to run the software provisioning manager.

#### Prerequisites

For more information, see Prerequisites for Running Software Provisioning Manager [page 99].

#### Context

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

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

For more information about the SL-UI, see Useful Information about Software Provisioning Manager [page 108].

#### Procedure

1. Log on to the installation host using an account with the required user authorization to run the software provisioning manager [page 73].

   △ Caution

   Do not use an existing `<sapsid>adm` or the built-in administrator account user.
If your security policy requires that the person running the software provisioning manager is not allowed to know administrator credentials 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 `sapinst.exe` from the command line. You must confirm that the user is a trusted one. For more information, see SAP Note [1745524](https://launchpad.support.sap.com/#/notes/1745524).

2. Make the installation media available.

For more information, see Preparing the Installation Media [page 80].

---

### Note

Even if you use the complete SAP kernel media, the software provisioning manager might prompt you during the provisioning process for additional archives (*.SAR files) due to special Patch Level (PL) requirements depending on categories such as the product, operating system, and database platform. `<x>` of the `SAPEXEDB.SAR` (for `DBTYPE=<Y>`), but this PL of the `SAPEXEDB.SAR` is not contained in the SAP kernel media. In this case you must download the required PL from [https://launchpad.support.sap.com/](https://launchpad.support.sap.com/#/softwarecenter#) following the instructions given in Downloading SAP Kernel Archives (Archive-Based Installation) [page 89].

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

```
   sapinst.exe (in a command prompt)
   .\sapinst.exe (in PowerShell)
```

### Note

If you are using a Stack XML file (see [Installation Using a Stack XML File](page 38)), you must call `sapinst.exe` with command line parameter `SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File>`:

```
   sapinst.exe SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File> (in a command prompt)
   .\sapinst.exe SAPINST_STACK_XML=<Absolute_Path_To_Stack_XML_File> (in PowerShell)
```

If you want to run your installation using a Stack XML file in unattended mode, consider the additional command line parameters described in [System Provisioning Using an Input Parameter File](page 109).

By default, the SL-UI uses the default browser defined for the host where you run the software provisioning manager. However, you can also specify another supported web browser available on the host where you start the software provisioning manager. You can do this by starting the `sapinst` executable with command line option `SAPINST_BROWSER=<Path_to_Browser_Executable>`, for example `SAPINST_BROWSER=firefox.exe`.

### Note

If you need to assign a virtual host name to the instance to be installed and you do not want to assign it by entering it as a parameter using the software provisioning manager screens (see [SAP System Parameters](page 50)), you can alternatively assign it as follows:

1. Open a command prompt or PowerShell window in elevated mode and change to the directory to which you unpacked the Software Provisioning Manager archive.
2. Start the software provisioning manager with the following command:

    sapinst.exe SAPINST_USE_HOSTNAME=<Virtual_Host_Name>  
    \sapinst.exe SAPINST_USE_HOSTNAME=<Virtual_Host_Name>  

(in a command prompt)

For more information, see Using Virtual Host Names [page 74].

**Note**

If you want to set the connectivity data for your SAP HANA database, you can add a parameter when calling sapinst as follows:

- ABAP secure storage in the file system (SSFS):

  sapinst.exe HDB_ABAP_SSFS=YES

- If you want to assign virtual host names, you must start the software provisioning manager with the SAPINST_USE_HOSTNAME command line parameter as follows:
  1. Open a command prompt or PowerShell window in elevated mode and change to the directory to which you unpacked the Software Provisioning Manager archive.
  2. Start the software provisioning manager with the following command:

    sapinst.exe SAPINST_USE_HOSTNAME=<Virtual_Host_Name>  
    \sapinst.exe SAPINST_USE_HOSTNAME=<Virtual_Host_Name>  

(in PowerShell)

For more information, see Setting Connectivity Data for the SAP HANA Database [page 69].

**Note**

If you are running a system copy with parallel export/import using the Migration Monitor with the R3load socket option and started the export with command line option SUPPORT_DECLUSTERING=false, you must start the software provisioning manager for the installation of the target database instance with command line option SUPPORT_DECLUSTERING=true for the import during the target system installation.

For more information, see the system copy guides at http://support.sap.com/sltoolset

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

If you have a supported web browser (see Prerequisites for Running Software Provisioning Manager [page 99]) installed on the host where you run the software provisioning manager, the SL-UI starts automatically by displaying the Welcome screen.

If the SL-UI does not open automatically, you can find the URL you require to access the SL-UI at the bottom of the Program Starter window of the software provisioning manager. You find the icon of the Program Starter window in the taskbar of your Windows host. Open a supported web browser and run the URL from there.

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

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

1. Terminate the software provisioning manager as described in Useful Information about Software Provisioning Manager [page 108].
2. Restart the software provisioning manager from the command line with the `SAPINST_GUI_HOSTNAME=<hostname>` property.
   You can use a fully-qualified host name.

⚠ Caution

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

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

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

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

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

1. Go to the `sapinst_exe.xxxxxx.xxxx` directory in the temporary directory to which the software provisioning manager has extracted itself:
   `%userprofile%\sapinst\`
2. In the `sapinst_exe.xxxxxx.xxxx` directory, execute the `sapgenpse` tool with the command line option `get_my_name -p`.
   As a result, you get the server fingerprint or thumbprint from the server certificate.
3. Accept the warning to inform your browser that it can trust this site, even if the certificate could not be verified.

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

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

- Perform preparations

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

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

- Install an SAP system:

  • To install an SAP system based on SAP NetWeaver AS ABAP from scratch, choose | <Product> > <Database> > Installation > Application Server ABAP > <System_Variant>.

  • To install the application server ABAP for an SAP Process Integration system based on SAP NetWeaver 7.5 from scratch, choose | SAP NetWeaver 7.5 > <Database> > Installation > Application Server ABAP for SAP Process Integration > <System Variant>.
• To install the application server ABAP for an SAP Solution Manager 7.2 system from scratch, choose [SAP Solution Manager 7.2 <Support_Release> <Database> Installation Application Server ABAP <System Variant>]

• To install an SAP system based on SAP NetWeaver AS ABAP as target system of a system copy, choose [Product <Database System Copy Target System <System_Variant Based on AS ABAP>]

• To install the application server ABAP for an SAP Process Integration system based on SAP NetWeaver 7.5 as target system of a system copy, choose [SAP NetWeaver 7.5 <Database System Copy Target System <System_Variant Based on AS ABAP>]

• To install the application server ABAP for an SAP Solution Manager 7.2 system as target system of a system copy, choose [SAP Solution Manager 7.2 <Support_Release> <Database System Copy Target System <System_Variant Based on AS ABAP>]

• Install an additional SAP system instance, go to [Product <Database Additional SAP System Instances Additional Application Server Instance>]

• Perform other tasks or install additional components

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

6. Choose Next.

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

7. If the software provisioning manager prompts you to log off from your system, log off and log on again.
The software provisioning manager restarts automatically.

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

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

i Note
If you want to install an ASCS instance with embedded SAP Web Dispatcher [page 32] or with embedded SAP Gateway [page 34] or both, you must choose the Custom parameter mode.

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

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

• Only valid for 'High Availability': HA (Windows)

High Availability only: If you decide to install an SAP Web Dispatcher or a Gateway in the ASCS instance, note that a failure of the SAP Web Dispatcher or the Gateway causes failover of the ASCS instance to another cluster node. The failover cluster monitors all processes that are started by the SAP start service (sapstartsrv.exe). For an ASCS instance this is: msg_server.exe (message server).
enserver.exe (enqueue server), gwrd.exe (Gateway), and sapwebdisp.exe (SAP Web Dispatcher). To prevent failover, see SAP Note 2375999.

End of ‘High Availability’: HA (Windows)

Note

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

- $datacodepage $datacodepage_of_source_system$

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

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

Caution

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

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

For more information, see SAP Note 2393060.

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

9. To start the installation, choose Next.

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

During the installation of an Application Server ABAP for SAP Process Integration 7.5 or SAP Solution Manager 7.2, the following is automatically accomplished by the software provisioning manager:

- The Java users for the Application Server Java for SAP Process Integration or SAP Solution Manager are created, which you have to install once the installation of the Application Server ABAP for SAP Process Integration or SAP Solution Manager is complete.

- The Application Server ABAP for SAP Process Integration or SAP Solution Manager is prepared for connection to the Application Server Java for SAP Process Integration or SAP Solution Manager.

For details on these users, see the Preparing an External ABAP System as Source for User Data chapter of the Installation of SAP Systems Based on the Application Server Java of SAP NetWeaver 7.5 and SAP Installation.
Solution Manager 7.2 SR2 Java on <OS>: <DB> documentation, which you must use anyway to install the Application Server Java for SAP Process Integration 7.5 or SAP Solution Manager 7.2 after you have installed the Application Server ABAP.

If you are performing an Installation Using a Stack XML File [page 38], the Software Update Manager (SUM) is started by the software provisioning manager at the end of the installation process. A browser window opens with a link to UI of the SUM that is already running. Follow the instructions on the SUM dialogs and in the SUM Guide at https://support.sap.com/sitoolkit System Maintenance.

10. If required install an additional application server instance for a standard (central) or distributed system.

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

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

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

You find the software provisioning manager log files in the sapinst_instdir directory. For more information, see Useful Information about Software Provisioning Manager [page 108].

5.5 Additional Information about Software Provisioning Manager

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

Useful Information about Software Provisioning Manager [page 108]

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

System Provisioning Using an Input Parameter File [page 109]

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

How to Avoid Automatic Logoff by Software Provisioning Manager [page 114]

Restarting Interrupted Processing of Software Provisioning Manager [page 115]

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

Entries in the Services File Created by Software Provisioning Manager [page 119]

Troubleshooting with Software Provisioning Manager [page 119]

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

Using the Step State Editor (SAP Support Experts Only) [page 120]

This section describes how to use the Step State Editor available in the software provisioning manager.
5.5.1 Useful Information about Software Provisioning Manager

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

- The software provisioning manager has a framework named “SAPinst”. For more information about the current SAPinst Framework version and its features, see SAP Note 3207613 (SAPinst Framework 753 Central Note).

- The software provisioning manager has the web browser-based “SL-UI of the software provisioning manager” - “SL-UI” for short.
  The SL-UI uses the SAP UI Development Toolkit for HTML5 - also known as SAPUI5 - a client-side HTML5 rendering library based on JavaScript. The benefits of this new user interface technology for the user are:
  - Zero foot print, since only a web browser is required on the client
  - New controls and functionality, for example, view logs in web browser.
  As of version 1.0 SP24 Patch Level (PL) 5, the software provisioning manager comes with a new look and feel of the SL-UI. For more information, see https://blogs.sap.com/2018/11/10/new-look-for-software-provisioning-manager/.

  The SL-UI connects the web browser on a client with the sapinst executable - which is part of software provisioning manager - running on the installation host using the standard protocol HTTPS.
  For the SL-UI, the software provisioning manager provides a pre-generated URL in the Program Starter window. If you have a supported web browser installed on the host where you run the software provisioning manager, the SL-UI starts automatically.
  By default, the SL-UI uses the default browser defined for the host where you run the software provisioning manager. However, you can also specify another supported web browser available on the host where you start the software provisioning manager. You can do this by starting the sapinst executable with command line option SAPINST_BROWSER=<Path to Browser Executable>, for example SAPINST_BROWSER=firefox.exe.
  Alternatively you can open a supported web browser on any device and run the URL from there.
  For more information about supported web browsers see Prerequisites for Running Software Provisioning Manager [page 99].
  If you need to run the SL-UI in accessibility mode, apply the standard accessibility functions of your web browser.

- As soon as you have started the sapinst.exe executable, the software provisioning manager creates a .sapinst directory underneath the <Drive>:\Users\<User> directory where it keeps its logs and other technical files. <User> is the user which you used to start the software provisioning manager.
  After you have reached the Welcome screen and selected the relevant software provisioning manager option for the SAP system or instance to be installed, the software provisioning manager creates a directory sapinst_instdir, where it keeps its logs and other technical files, and which is located directly in the %ProgramFiles% directory. If the software provisioning manager is not able to create sapinst_instdir there, it tries to create sapinst_instdir in the directory defined by the TEMP environment variable.
  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.
  The software provisioning manager records its progress in the keydb.xml file located in the sapinst_instdir directory. Therefore, if required, you can continue with the software provisioning manager from any point of failure, without having to repeat the already completed steps and without having to reenter the already processed input parameters. For security reasons, a variable encryption key
is generated as soon as the `sapinst_instdir` directory is created by the software provisioning manager. This key is used to encrypt the values written to the `keydb.xml` file.

→ **Recommendation**

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

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

⚠️ **Caution**

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

- To see a list of all available software provisioning manager properties (command line options) and related documentation, open a command prompt and start the software provisioning manager with command line parameter `-p`:
  ```
  sapinst -p
  ```
  
  - If you want to perform the installation in unattended mode, see System Provisioning Using an Input Parameter File [page 109] which describes an improved procedure using `inifile.params`.
  
  - If required, stop the software provisioning manager by choosing the `Cancel` button.

---

5.5.2 **System Provisioning Using an Input Parameter File**

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

**Prerequisites**

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

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

Since the new Web-based SL-UI (see Useful Information about Software Provisioning Manager [page 108]) was introduced in 2017 there are two ways to run the unattended mode: "observer mode" and "non-observer mode".

**Observer Mode**

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

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

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

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

**Non-Observer Mode**

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

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

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

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

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

**Restrictions**

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

• The input parameter file only contains values that you entered in the software provisioning manager's SL-UI.

• With the SAPinst 749.0.69 or by other means patch we provide a better encryption of passwords in software provisioning manager files:

  If the input parameter file has parameters which are encrypted with Des25 encryption, the instkey.pkey file available in the installation directory contains the key for the encryption. The instkey.pkey file must be always located in the same directory as the input parameter file and is used to decrypt the values of the encrypted parameters. If you need to copy an input parameter file to another directory, you must also copy the instkey.pkey file to this directory.

• Not explicitly set parameters are documented as comments in the generated input parameter file.

• Each parameter has got a documentation assigned as a comment on top.

Example

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

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

Example

Example for a parameter that is used:

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

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

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

• For each media location you must manually insert a dedicated line in your input parameter file. The software provisioning manager does not automatically take over the media locations you entered while processing the Media Browser dialog.

• For <media_name> you can choose any value, but the <location> must be unique.

• To find out the required media entries, open the summary.html file which you can find in the installation directory and go to the Dialog "Media" section.

• Make sure that you enter the full paths to all required media, relative paths are not sufficient.

Example

Example on UNIX:

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

Example

Example on Windows:

```plaintext
SAPINST.CD.PACKAGE.KERNEL = C:\sapdvds\KERNEL
```
If one media contains several subfolders, you can specify it in one of the following ways:

**Example**

The SAP Export DVDs/media:

<table>
<thead>
<tr>
<th>Installation Master</th>
<th>/usr/local/TESI/SWPM/slinst_d_stream/</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM_OS400_PPC64</td>
<td>/sapmnt/mediaserver2/</td>
</tr>
<tr>
<td>Installation Export NW73 (folder EXP1)</td>
<td>/sapmnt/mediaserver2/</td>
</tr>
<tr>
<td>arch04_6/51042309/DATA_UNITS/EXP1</td>
<td>/sapmnt/mediaserver2/</td>
</tr>
<tr>
<td>Installation Export NW73 (folder EXP3)</td>
<td>/sapmnt/mediaserver2/</td>
</tr>
<tr>
<td>arch04_6/51042309/DATA_UNITS/EXP3</td>
<td>/sapmnt/mediaserver2/</td>
</tr>
<tr>
<td>Installation Export NW73 (folder EXP2)</td>
<td>/sapmnt/mediaserver2/</td>
</tr>
<tr>
<td>arch04_6/51042309/DATA_UNITS/EXP2</td>
<td>/sapmnt/mediaserver2/</td>
</tr>
</tbody>
</table>

- By specifying each subfolder:
  
  | SAPINST.CD.PACKAGE.ExportNW73EXP1=/sapmnt/mediaserver2/ |
  | arch04_6/51042309/DATA_UNITS/EXP1             |
  
  | SAPINST.CD.PACKAGE.ExportNW73EXP2=/sapmnt/mediaserver2/ |
  | arch04_6/51042309/DATA_UNITS/EXP2             |
  
  | SAPINST.CD.PACKAGE.ExportNW73EXP3=/sapmnt/mediaserver2/ |
  | arch04_6/51042309/DATA_UNITS/EXP3             |

- By specifying only the root-folder:
  
  | SAPINST.CD.PACKAGE.ExportNW73=/sapmnt/mediaserver2/arch04_6/51042309 |

**Restriction:** Currently you can only specify complete media, not paths to single files like *.SAR archives.

- When performing a system copy, you need to add one additional media path:
  
  | SAPINST.CD.PACKAGE.MIGRATION1 = <full path to ABAP Export media> |

**Caution:**

If you want to use archives for your installation, you must copy all files that are to be used to a single directory. In the input parameter file you must specify this directory as a download basket, using the `archives.downloadBasket` parameter. Make sure that there is only one version of the same archive in the directory, for example `SAPEXE_<Version>.SAR`.

### Procedure

1. You plan and prepare the run as described in *Planning [page 37]* and *Preparation [page 68]*.
2. Create your input parameter file as follows:
   
   1. Start software provisioning manager as described in *Running Software Provisioning Manager [page 101]*.
   2. Choose the option you want to run, and follow the instructions on the screens by entering all parameter values.
3. Stop after the Parameter Summary screen has been displayed.

4. Find the input parameter file named “inifile.params” in the installation directory.
   - In the same directory, you will also find the instkey.pkey file with the keys for the encrypted parameters. For more information, see Must Know about the Input Parameter File above.
   - In the same directory, you will also find the summary.html file with the required media locations. For more information, see Must Know about the Input Parameter File above.

5. If required, you can rename the “inifile.params” file as you wish.

3. Adjust the values of the input parameter file as follows:
   1. Edit your input parameter file and modify the parameters according to your needs.
   2. Add required media or archives information line by line.

4. Identify the Product-ID:
   - To start in unattended mode, you need to know the component ID for the option that are required for your provisioning scenario.
     Proceed as follows:
     1. Open the sapinst_dev.log in the installation directory.
     2. Check for the “product-id”

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

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

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

5. Run the software provisioning manager [page 101] with the parameters required for unattended mode:
   - Make sure that the instkey.pkey file with the keys for the encrypted parameters is available in the same directory as the input parameter file. Otherwise the encrypted parameters cannot be decrypted. For more information, see Must Know about the Input Parameter File above.
   - In observer mode: Start the sapinst executable from an empty directory with the following parameters:

     ```
     SAPINST_INPUTPARAMETERS_URL=<path_to_your_parameterfile>
     SAPINST_EXECUTEPRODUCT_ID=<product-id for the installation>
     SAPINST_SKIP_DIALOGS=true
     ```

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

     ```
     SAPINST_INPUTPARAMETERS_URL=<path_to_your_parameterfile>
     SAPINST_EXECUTEPRODUCT_ID=<product-id for the installation>
     SAPINST_SKIP_DIALOGS=true
     SAPINST_START_GUISERVER=false
     ```

6. After software provisioning manager has completed, perform follow-up activities as described in Post-Installation [page 122].
5.5.3 How to Avoid Automatic Logoff by Software Provisioning Manager

When you install the SAP system, the installation tool checks whether the user account used for the installation has the required privileges and authorization.

For a local or domain installation, the account needs to be a member of the local Administrators group.

For domain installations the account can be either a member of the Domain Admins group, or belongs to the Domain Users group and has the necessary rights to create/modify objects in the domain.

For a list of the required permission, see Performing a Domain Installation without being a Domain Administrator [page 169]

In both cases, the user account must be authorized to do the following:

- Act as part of the operating system
- Adjust memory quotas for a process
- Replace a process level token

If the user account does not have these rights assigned, the software provisioning manager assigns them and automatically logs the account off to activate them. To avoid the software provisioning manager logging the account off, you can set these rights manually before you start the installation.

Procedure

You perform the following steps to assign these rights to the user account used for the installation.

1. Press Ctrl + Esc and choose Administrative Tools > Local Security Policy.
2. In the Local Security Settings window, choose Local Policies > User Rights Assignment.
3. Double-click the required right under Policy and choose Add User or Group.
4. In the Select Users and Groups window, choose the required user and choose Add. The selected user appears in the box below.
5. Confirm your entry and then repeat the steps for each remaining policy that the user requires for the installation.
6. Log off and log on again to apply the changes.

Related Information

Required User Authorization for Running Software Provisioning Manager [page 73]

5.5.4 Restarting Interrupted Processing of Software Provisioning Manager

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

Context

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

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

• You interrupted the processing of the software provisioning manager by choosing Cancel in the SL-UI.

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

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

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 Software Provisioning Manager [page 101].
2. Make sure that the installation media are still available.
   
   For more information, see Preparing the Installation Media [page 80].
   
   **→ Recommendation**
   
   Make the installation media available **locally**. For example, if you use remote file shares on other Windows hosts, CIFS shares on third-party SMB-servers, or Network File System (NFS), reading from media mounted with NFS might fail.
3. Make sure that the installation media are still available.
   
   For more information, see Preparing the Installation Media [page 80].
   
   **→ Recommendation**
   
   Make the installation media available **locally**. For example, if you use remote file shares on other Windows hosts, CIFS shares on third-party SMB-servers, or Network File System (NFS), reading from media mounted with NFS might fail.
4. Restart the software provisioning manager by double-clicking `sapinst.exe` from the directory to which you unpacked the software provisioning manager archive.

By default, the SL-UI uses the default browser defined for the host where you run the software provisioning manager. However, you can also specify another supported web browser available on the host where you start the software provisioning manager. You can do this by starting the `sapinst` executable with command line option `SAPINST_BROWSER=<Path to Browser Executable>`, for example `SAPINST_BROWSER=firefox.exe`.

5. The software provisioning manager is restarting.

If you have a supported web browser (see Prerequisites for Running Software Provisioning Manager [page 99]) installed on the host where you run the software provisioning manager, the SL-UI starts automatically by displaying the Welcome screen.

If the SL-UI does not open automatically, you can find the URL you require to access the SL-UI at the bottom of the Program Starter window of the software provisioning manager. You find the icon of the Program Starter window in the taskbar of your Windows host. Open a supported web browser and run the URL from there.

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

**i Note**

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

1. Terminate the software provisioning manager as described in Useful Information about Software Provisioning Manager [page 108].
2. Restart the software provisioning manager from the command line with the `SAPINST_GUI_HOSTNAME=<hostname>` property.

You can use a fully-qualified host name.

**Caution**

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

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

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

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

1. Go to the `sapinst.exe.xxxxxx.xxxx` directory in the temporary directory to which the software provisioning manager has extracted itself:
   
   `%userprofile%\.sapinst\`

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

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

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

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

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

   The *What do you want to do?* screen appears.

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

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Behavior</th>
</tr>
</thead>
</table>
| **Perform a new run**             | The software provisioning manager does not continue the interrupted installation option. Instead, it moves the content of the old software provisioning manager directory and all software provisioning manager-specific files to a backup directory. Afterwards, you can no longer continue the old option.  

   The following naming convention is used for the backup directory:

   `log_<Day>_<Month>_<Year>_<Hours>_<Minutes>_<Seconds>`

   **Example**

   `log_01_Oct_2016_13_47_56`

   **i Note**

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

   **Caution**

   The software provisioning manager moves all the files and folders to a new log directory, even if these files and folders are owned by other users. If there are any processes currently running on these files and folders, they might no longer function properly.

| **Continue with the existing one** | The software provisioning manager continues the interrupted installation from the point of failure. |
5.5.5 Entries in the Services File Created by Software Provisioning Manager

After the installation has finished successfully, the software provisioning manager has created the following entries for port names in `\<Drive>\WINDOWS\system32\drivers\etc\services`:

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

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

5.5.6 Troubleshooting with Software Provisioning Manager

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

**Context**

If an error occurs, the software provisioning manager:

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

**Procedure**

1. Check SAP Note SAP Note 3207613 (SAPinst Framework 753 Central Note) for known software provisioning manager issues.
2. If an error occurs during the Define Parameters or the Execute Service phase, do one of the following:

   - Try to solve the problem:
     - To check the software provisioning manager log files (sapinst.log and sapinst_dev.log) for errors, choose the LOG FILES tab.

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

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

     For more information, see Useful Information about Software Provisioning Manager [page 108].

   - To check the log and trace files of the software provisioning manager’s SL-UI for errors, go to the directory %userprofile%/.sapinst/

   - Then continue by choosing Retry.

   - If required, abort the software provisioning manager by choosing Cancel in the tool menu and restart the software provisioning manager. For more information, see Restarting Interrupted Processing of Software Provisioning Manager [page 115].

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.

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

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

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

Prerequisites

- SAP Support requests you to use the Step State Editor.
- Make sure that the host where you run the software provisioning manager meets the requirements listed in Prerequisites for Running Software Provisioning Manager [page 99].
Procedure

1. Start the software provisioning manager from the command line as described in Running Software Provisioning Manager [page 101] with the additional command line parameter `SAPINST_SET_STEPSTATE=true`.

2. Follow the instructions on the software provisioning manager screens and fill in the parameters prompted during the Define Parameters phase until you reach the Parameter Summary screen.

3. Choose Next.
   
The Step State Editor opens as an additional dialog. Within this dialog you see a list of all steps to be executed by the software provisioning manager during the Execute Service phase. By default all steps are in an initial state. Underneath each step, you see the assigned software provisioning manager component. For each step you have a Skip and a Break option.
   - Mark the checkbox in front of the Break option of the steps where you want the software provisioning manager to pause.
   - Mark the checkbox in front of the Skip option of the steps which you want the software provisioning manager to skip.

4. After you have marked all required steps with either the Break or the Skip option, choose OK on the Step State Editor dialog.
   
The software provisioning manager starts processing the Execute Service phase and pauses one after another when reaching each step whose Break option you have marked. You can now choose one of the following:
   - Choose OK to continue with this step.
   - Choose Step State Editor to return to the Step State Editor and make changes, for example you can repeat the step by marking the checkbox in front of the Repeat option.
   - Choose Cancel to abort the software provisioning manager.

5. Continue until you have run through all the steps of the Execute Service phase of the software provisioning manager.
6 Post-Installation

6.1 Post-Installation Checklist

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

**Note**

**SAP systems based on SAP NetWeaver 7.4:**

You can automate some of these post-installation steps by running task list `SAP_BASIS_SETUP_INITIAL_CONFIG` in the ABAP task manager for lifecycle management automation (transaction STC01). For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 125].

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

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

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

**Note**

We highly recommend that you apply the latest Support Package as described in Applying the Latest Kernel [page 140]. The minimum requirement for running SAP BW on the SAP HANA database is SP4.

---

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

**Note**

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

The SAP HANA database is normally pre-installed by SAP partners before you start the installation. During the SAP system installation, the database instance was remotely installed by the software provisioning manager from the primary application server host.

1. You check whether you can log on to the Application Server ABAP [page 124].
2. **SAP systems based on SAP NetWeaver 7.4 and higher only:** You perform the automated initial setup [page 125].

**Note**

This step is optional.
3. If you have not enabled SAP EarlyWatch Alert in your SAP Solution Manager, you enable SAP EarlyWatch Alert for ABAP Systems on SAP HANA [page 127].

4. You install the SAP license [page 128].

5. You configure the remote connection to SAP support [page 130].

6. You enable the Note Assistant to apply note corrections [page 131].

7. You configure the documentation provided on the SAP Help Portal [page 131].

8. You perform the consistency check [page 133].

9. If required, you set up symbolic links for application servers [page 134].

10. You configure the Transport Management System [page 135].

11. For production systems it is highly recommended that you connect the system to SAP Solution Manager [page 137].

12. Run software provisioning manager option Check and Adjust ABAP System to apply necessary configuration steps.

13. You apply the latest kernel and Support Packages [page 140].

14. You perform post-installation steps for the application server ABAP [page 141].

15. If you installed a high-availability system based on SAP NetWeaver AS for ABAP 7.52, you can decide whether you want to switch to the new standalone enqueue server 2 and enqueue replicator 2 [page 144].

16. If you installed the ABAP part of an SAP Solution Manager 7.2 or SAP Process Integration 7.5 system, enable HTTPS communication with the Java part of the system.

For more information, see SAP Solution Manager 7.2, SAP Process Integration 7.5 only: Enabling HTTPS Communication for ABAP [page 145].

17. If required, you install additional languages and perform language transport [page 145].

18. You configure the user management [page 147].

---

**Note**

This section does not apply for SAP Process Integration 7.5 and SAP Solution Manager, because for them the user management with an external ABAP system is mandatory. For SAP Process Integration 7.5 and SAP Solution Manager you have to perform special configuration steps which are described in the guide you have to use for the installation of the Java stack.

19. You ensure user security [page 148].

20. You perform the client copy [page 151].

21. You install or upgrade SAP HANA studio [page 152].

22. You back up the SAP HANA database [page 153].

23. **SAP systems based on SAP NetWeaver 7.4 and higher only**: If required, you change the keys for the secure storage [page 153].

24. You perform a full system backup [page 155].

25. If you chose to install an embedded SAP Web Dispatcher within the ASCS instance, you log on to the SAP Web Dispatcher Management Console [page 156].

26. If you chose to install an embedded SAP Web Dispatcher within the ASCS instance, you configure the SAP Web Dispatcher [page 157].

27. If you chose to install an embedded Gateway within the ASCS instance, you configure the SAP Gateway [page 158].

28. You check the Master Guide - called “Installation Guide” for SAP S/4HANA - for your SAP Business Suite application, SAP Solution Manager system (section Implementation Sequence) or SAP NetWeaver application (section Configuration of Systems and Follow-Up Activities) for additional implementation and
configuration steps, such as language installation, monitoring, work processes, transports, SAP license, printers, system logs, and connectivity to system landscape directory (SLD).

Additional Application Server Instance

1. You check whether you can log on to the Application Server ABAP [page 124].
2. You configure the documentation provided on the SAP Help Portal [page 131].
3. You ensure user security [page 148].
4. If required, you set up symbolic links for application servers [page 134].
5. You perform a full system backup [page 155].

6.2 Logging On to the Application Server ABAP

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

Prerequisites

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

Context

**i Note**

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

**i Note**

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

<table>
<thead>
<tr>
<th>User</th>
<th>User Name</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP system user</td>
<td>SAP*</td>
<td>000, 001, 066</td>
</tr>
</tbody>
</table>
You access the application server ABAP using **SAP Logon**.

**Procedure**

1. Start **SAP Logon** on the host where you have installed the SAP front-end software as follows:
   - **SAP GUI for Windows**:
     1. Press `Windows + Q`, and enter **SAP Logon** in the Search field.
     2. Choose **SAP Logon**.
   - **SAP GUI for Java**:
     1. Press `Windows + Q`, and enter **SAP GUI for Java <Release>**
     2. Choose **SAP GUI for Java <Release>**.
   The **SAP Logon** appears.

   **Note**
   You can alternatively enter the command `guilogon` in the SAP GUI installation directory to start SAP GUI for Java.

2. Create a logon entry for the newly installed system in the **SAP Logon**.
   For more information about creating new logon entries, press F1
3. When you have created the entry, log on as user **SAP* or DDIC**.

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

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

**Prerequisites**

Note that the best point in time when you perform automated initial setup depends on the following:
If you have run the installation using a Stack XML file (also called “up-to-date installation”), we recommend that you proceed as follows:

1. Perform the complete installation and update process - that is the installation with Software Provisioning Manager and the update with Software Update Manager.
2. Perform the automated initial setup.

By running first the update and then the automated initial setup, you can profit from latest features and fixes in the initial setup configuration content.

Background: As of Software Logistics Toolset 1.0 SPS12, the installation procedure with Software Provisioning Manager 1.0 SP07 and higher also includes basic configuration activities, such as initial basic configuration of transport management, which are a prerequisite for the subsequent maintenance process.

In previous SP versions of Software Logistics Toolset 1.0, this prerequisite had to be fulfilled by running automated initial setup before the update process.

If you have not run the installation using a Stack XML file (also called “up-to-date installation”), we recommend that you proceed as follows:

1. Run automated initial setup directly after the installation, using the automation content provided with the system load.
2. Apply the Support Packages to benefit from the already performed initial configuration – for example, using the already configured Transport Management System.
3. Consider running the automated initial setup a second time, especially if you want to benefit from the latest improvements and fixes offered by the updated automation content provided by the applied Support Package.

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

Procedure

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

Related Information

Installation Using a Stack XML File [page 38]
Installing the SAP License [page 128]
Configuring the Remote Connection to SAP Support [page 130]
Configuring the Change and Transport System [page 135]
Applying the Latest Kernel and Support Package Stacks [page 140]
Performing Post-Installation Steps for the ABAP Application Server [page 141]
6.4 Enabling SAP EarlyWatch Alert for ABAP Systems on SAP HANA

Context

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

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

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

The task list comprises the following detailed tasks:

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

Procedure

1. Download the archive SAPK-74005INSTPI or higher at:
   http://support.sap.com/installations
   Software Downloads ➤ Support Packages and Patches ➤ By Alphabetical Index (A-Z) ➤ S ➤ ST-PI ➤ ST-PI 740 ➤ SUPPORT PACKAGES
2. Apply the downloaded ST-PI archive via SPAM/SAINT.
   For more information, see http://help.sap.com/spmanager.
3. Start the ABAP Task Manager by calling transaction STC01.
4. Choose the task list /BDL/SDCCN_EWA_CONFIG.
5. Choose Execute.
   You are guided through the configuration steps.

### 6.5 Installing the SAP License

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

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAP systems based on SAP NetWeaver 7.4 or higher only:</strong></td>
</tr>
<tr>
<td>You can automate this step by running task list SAP_BASIS_SETUP_INITIAL_CONFIG in the ABAP task manager for lifecycle management automation (transaction STC01). For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 125].</td>
</tr>
</tbody>
</table>

**Context**

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before</strong> the temporary license expires, you must apply for a permanent license key from SAP.</td>
</tr>
<tr>
<td>We recommend that you apply for a permanent license key as soon as possible after installing your system.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>i Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>The license key is bound to the hardware key of the host where the message server is running.</td>
</tr>
<tr>
<td><strong>High Availability only:</strong></td>
</tr>
<tr>
<td>In a high-availability system with Microsoft Failover Clustering, the message server is part of the ASCS instance that can run on a different cluster node. Therefore you must install the SAP license on both nodes.</td>
</tr>
<tr>
<td>You have to do failover from the first cluster node where the ASCS instance is installed to the second cluster node. Use the hardware key of the second cluster node for the installation of the second SAP license.</td>
</tr>
<tr>
<td>For more information about SAP license keys and how to obtain them, see <a href="http://support.sap.com/licensekey">http://support.sap.com/licensekey</a>.</td>
</tr>
</tbody>
</table>
Procedure

Install the SAP license 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 7.3 including Enhancement Package 1  
| • SAP NetWeaver 7.4  
  [link](http://help.sap.com/nw74) |
| • SAP NetWeaver 7.5  
  [link](http://help.sap.com/nw75) |
| • SAP NetWeaver Application Server for ABAP 7.51 innovation package  
  [link](https://help.sap.com/nw751abap) |
| • SAP NetWeaver AS for ABAP 7.52  
  [link](https://help.sap.com/nw752abap) |

6.6 High Availability: Setting Up Licenses

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

Prerequisites

The SAP system is up and running.

Context

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

To be able to perform a switchover, the **temporary** license that is installed automatically with the ASCS instance is not sufficient. You first need to install a **permanent** license, which is determined by the hardware environment of the message server. Since SAP’s high-availability (HA) solution stipulates two or more cluster nodes (host machines) where the message server is enabled to run, you have to order as many **license keys** [page 128] as you have cluster nodes.
When we receive confirmation from your vendor that you are implementing a switchover environment, we provide the required license keys for your system, one key for each machine.

Procedure

1. To find the hardware ID of the primary host, log on to any application server instance of the SAP system and call transaction SLICENSE.

2. Perform a switchover of the ABAP central services instance (ASCS) to another node in the cluster and repeat the previous step.
   
   Repeat this for all remaining nodes in the cluster.

3. To obtain the two license keys, enter the hardware IDs for each cluster node, where message server is enabled to run: http://support.sap.com/licensekey

4. To import the files containing the two licenses, log on to any application server instance of the SAP system and call transaction SLICENSE.

5. Perform a switchover of the ABAP central services instance (ASCS) to another node in the cluster and repeat the previous step.
   
   Repeat this for all remaining nodes in the cluster.

Results

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

6.7 Configuring the Remote Connection to SAP Support

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

Note

SAP systems based on SAP NetWeaver 7.4 or higher only:

You can automate this step by running task list SAP_BASIS_SETUP_INITIAL_CONFIG in the ABAP task manager for lifecycle management automation (transaction STC01). For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 125].

For more information, see SAP Support Portal at https://support.sap.com/remote-support.html.
6.8 Enabling Note Assistant to Apply Note Corrections

Use the Note Assistant to implement note corrections in your ABAP system.

**Context**

The Note Assistant allows you to automatically implement note corrections in your ABAP system. For more information about the Note Assistant, see [https://support.sap.com/noteassistant](https://support.sap.com/noteassistant) and [https://help.sap.com/netweaver](https://help.sap.com/netweaver) > SAP NetWeaver Platform > Application Help > SAP NetWeaver Library: Function-Oriented View > Solution Life Cycle Management > Software Logistics > Note Assistant.

**Procedure**

1. Follow the instructions in SAP Note 2836302 for enabling the Note Assistant for TCI and digitally signed SAP Notes.
2. Apply important SAP Notes for SAP_BASIS as described in SAP Note 1668882.

6.9 Configuring Documentation Provided on the SAP Help Portal

In transaction SR13, you can configure the settings of your backend system to point to documentation that is provided on the SAP Help Portal.

**Context**

You can configure your backend system to access documentation that is provided on the SAP Help Portal.

**Prerequisites**

- The documentation you want to access must be available on the SAP Help Portal.
- The users who access the documentation must have access to the Internet.
- You can configure an ABAP system to connect to only one combination of product and version.

If you cannot fulfill one or more of these prerequisites, you must install the documentation in your local system landscape using the download packages or media provided.
i Note
For more information about installing the documentation in your local system landscape, see the Installation of SAP Library guide.

Procedure

2. Select the tab PlainHtmlHttp.
3. Choose New Entries.

⚠️ Caution
You have to create entries for both documentation and XML documentation areas for each platform you are using and each language in which you want to provide documentation.
You must use the exact combination of uppercase and lowercase characters specified in the product and version.

To find the correct entry for the Path field, see the list of products and versions attached to SAP Note 2652009.

4. To create entries for the documentation area, enter the following values:

<table>
<thead>
<tr>
<th>Name</th>
<th>Value to be entered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variant</td>
<td>Enter a name for the variant.</td>
</tr>
<tr>
<td>Platform</td>
<td>Select the platform relevant for your implementation from the list of available platforms, for example, WN32.</td>
</tr>
<tr>
<td>Area</td>
<td>Select Documentation from the list; this will display as IWBHELP in the table.</td>
</tr>
<tr>
<td>Path</td>
<td>&lt;product/version&gt;</td>
</tr>
<tr>
<td>Language</td>
<td>Select the language you need from the list.</td>
</tr>
</tbody>
</table>

5. To create entries for the XML documentation area, enter the following values:

<table>
<thead>
<tr>
<th>Name</th>
<th>Value to be entered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variant</td>
<td>Enter a name for the variant (any name).</td>
</tr>
<tr>
<td>Platform</td>
<td>Select the platform relevant for your implementation from the list of available platforms, for example, WN32.</td>
</tr>
<tr>
<td>Area</td>
<td>Select XML Documentation from the list; this will display as XML_DOCU in the table.</td>
</tr>
</tbody>
</table>
**Name** | **Value to be entered**
---|---
Path | `<product/version>`
To find the correct entry for the Path field, see the list of products and versions attached to SAP Note [2652009](#).

| **Language** | Select the language you need from the list. |
---|---|

6. Repeat steps 4 and 5 for each relevant platform and language.
7. Select one entry as the default language for each platform and area.
8. Save your entries.

**Results**

You have configured the settings to point to documentation that is provided on the SAP Help Portal.

**Related Information**

- Installation of SAP Library
- SAP Note [2149786](#)
- SAP Note [2652009](#)

**6.10 Performing the Consistency Check**

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

---

**i Note**

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

You can automate this step by running task list `SAP_BASIS_SETUP_INITIAL_CONFIG` in the ABAP task manager for lifecycle management automation (transaction STC01). For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 125].

---

**Prerequisites**

- If the installation finished successfully, your SAP system should be up and running. Otherwise, start it as described in Starting and Stopping the SAP System [page 174].
You have logged on to the SAP system [page 124].

Context

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

The following checks are performed:

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

Procedure

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

6.11 Creating Symbolic Links on Windows Server for Application Servers

Use

On Windows Server you can create symbolic links for additional application server instances to simplify their administration.
In a high-availability system, you can additionally create symbolic links for the primary application server instance.

Symbolic links for application servers let you access from your local host the SYS directory that is located on the global host, without having to specify its UNC path. Instead you can browse, for example, in the Windows explorer on your local host to the SYS directory and its subdirectories on the global host.

**Procedure**

To create symbolic links, perform the following steps:

1. Open a PowerShell command in elevated mode, and enter the following PowerShell command in a single line:
   ```
cmd /c mklink /d <localdisk>:\usr\sap\<SAPSID>\SYS \n   \<sapglobalhost>\sapmnt\<SAPSID>\SYS
   ```

   **iNote**
   
Enter a blank before `\\<sapglobalhost>`.

2. If you use a central transport directory, you can also create the following link in PowerShell:
   ```
cmd /c mklink /d <localdisk>:\usr\sap\trans \\<trans_dir_host>\sapmnt\trans
   ```

   **iNote**
   
The transport directory host `<trans_dir_host>` and the `<sapglobalhost>` can be identical.

   **Caution**
   
The command `mklink` creates the link without checking whether the link target exists or is accessible. If the link does not work after you created it, make sure that it exists and check the accessibility of the UNC path.

### 6.12 Configuring the Change and Transport System

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

**iNote**

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

You can automate this step by running task list `SAP_BASIS_SETUP_INITIAL_CONFIG` in the ABAP task manager for lifecycle management automation (transaction STC01). For more information, see [SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 125]].
i Note
SAP_BASIS_SETUP_INITIAL_CONFIG only covers the configuration of TMS as single system.

i Note
If you are using a Stack XML file (see Installation Using a Stack XML File [page 38]) and chose Run TMS Configuration (for Single System) during the installation, you have already completed this step and and skip this section.

Context

Procedure

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

   For more information, see the SAP Library at:

   **SAP Release and SAP Library Quick Link**
   - SAP NetWeaver 7.3 including Enhancement Package 1
     http://help.sap.com/nw731
   - SAP NetWeaver 7.4
     http://help.sap.com/nw74
   - SAP NetWeaver 7.5
     http://help.sap.com/nw75
   - SAP NetWeaver Application Server for ABAP 7.51 innovation package
     https://help.sap.com/nw751abap
   - SAP NetWeaver AS for ABAP 7.52
     https://help.sap.com/nw752abap

   **SAP Library Path (Continued)**
   - Application Help
   - Function-Oriented View
   - Solution Life Cycle Management
   - Software Logistics
   - Change and Transport System
   - Change and Transport System – Overview
   - Basics of the Change and Transport System
   - Transport Management System – Concept

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

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
</table>
| • SAP NetWeaver 7.3 including Enhancement Package 1  
  http://help.sap.com/nw731 | Application Help ➤ Function-Oriented View ➤ Solution |
| • SAP NetWeaver 7.4  
| • SAP NetWeaver 7.5  
  http://help.sap.com/nw75 | and Transport System ➤ Transport Organizer (BC-CTS- |
| • SAP NetWeaver Application Server for ABAP 7.51  
  innovation package  
  https://help.sap.com/nw751abap | ORG) ➤ Requirements for Working with the Transport |
| • SAP NetWeaver AS for ABAP 7.52  
  https://help.sap.com/nw752abap | Organizer ➤ Setting the System Change Option |

3. Only valid for ‘High Availability’: HA (Windows)
   In a high-availability system with Microsoft Failover Clustering, you must configure all systems in the TMS landscape. To do this, implement SAP Note 943334.

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

### 6.13 Connecting the System to SAP Solution Manager

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

<i>Note</i>

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

### Prerequisites

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

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

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

Procedure

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

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

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

2. The data suppliers send information about the hardware and installed software to a central System Landscape Directory (SLD). Updates are sent to the SLD as well. Alternatively, systems can send information directly to the LMDB in SAP Solution Manager, without an SLD, as described in http://help.sap.com/solutionmanager\#Version 7.2 SPS <No> Application Help (English) Technical Infrastructures > Landscape Management Database (LMDB) > Setting Up the Landscape Management Infrastructure > Importing Landscape Data, CIM Model, and CR Content.


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

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

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

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

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

Related Information

- Setting Up the Landscape Management Infrastructure
- Importing Landscape Data, CIM Model, and CR Content
- Synchronization with an SLD
- Managing Technical System Information
- Handling Technical Systems’ Data - System Landscape Directory

6.14 Running Software Provisioning Manager Option “Check and Adjust ABAP System”

Run software provisioning manager option Check and Adjust ABAP System to apply some necessary configuration steps.

Procedure

1. Start the software provisioning manager as described in Running Software Provisioning Manager [page 101].
2. On the Welcome screen, choose software provisioning manager option Generic Options SAP HANA Database Check and Adjust ABAP System

Follow the instructions on the software provisioning manager screens and enter the parameters for the ABAP system to be checked and adjusted.
On the Check Adjust SAP System screen, select the required option:

- **HDI_CHECK_ENABLE**
  If your SAP system is based on SAP NetWeaver AS for ABAP 7.52, running this option applies some necessary configuration for the HANA Deployment Infrastructure (HDI) content. If you do not run this option, updating the ABAP system using transaction SPAM might fail.

- **REPAIR_PRIVILEGES**
  With this option you can recreate the privileges for the ABAP schema user.

### 6.15 Applying the Latest Kernel and Support Package Stacks

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

**Note**

If you are using a Stack XML file (see Installation Using a Stack XML File [page 38]), you already downloaded the stack.xml file and the delta archives. If you then already called the Software Update Manager (SUM) from the software provisioning manager and applied the Support Package Stacks after the installation had finished, you can skip this section.

**Context**

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

**Central SAP Notes**

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

The white paper Update Strategy for the Kernel of the Application Server ABAP in On Premise Landscapes provides SAP recommendations on how to patch the SAP kernel.
If you have installed an SAP Solution Manager 7.2 system, you must apply at least Support Package Stack (SPS) 01. You cannot use SAP Solution Manager 7.2 with SPS 00.

Procedure

- Download and apply the latest Kernel and Support Package stacks using the Software Update Manager (SUM) as described in the Software Update Manager documentation at: https://support.sap.com/en/tools/software-logistics-tools/software-update-manager.html
- 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.

6.16 Performing Post-Installation Steps for the ABAP Application Server

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

SAP systems based on SAP NetWeaver 7.4 or higher only:

You can automate this step by running task list SAP_BASIS_SETUP_INITIAL_CONFIG in the ABAP task manager for lifecycle management automation (transaction STC01). For more information, see SAP NetWeaver 7.4 and Higher: Performing Automated Initial Setup (Optional) [page 125].

Prerequisites

You have logged on to the ABAP application server as described in Logging On to the Application Server [page 124].
You have to perform the following post-installation steps for the ABAP application server:

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

For more information, see the appropriate sections below.

**Procedure**

- **Upload and Set System Profiles using Transaction RZ10**
  
  You upload system profiles, such as default profile and instance profile, from the file system into the database of the target system using transaction **RZ10**.

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

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

- **Configure the number of work processes**
  
  SAP systems are installed with a minimum number of work processes. This is only an initial configuration to get you started after the installation. It is not detailed enough for a production system because the optimal number of each type of work process depends on the system resources and on the number of users working in each SAP system application. For more information about how many work processes to configure and how to set the number, see SAP Note **39412**.

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

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

If required, you create the RFC server group parallel_generators.

- **Create Operation Modes using Transaction RZ04**

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

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

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

- **Schedule Standard Jobs using Transaction SM36**

You schedule SAP standard jobs using transaction SM36.

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

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

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

For more information, see Connecting the System to SAP Solution Manager [page 137]

- **Perform Load Generation using Transaction SGEN**

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

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

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

• Prepare All Objects for Generation

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

6.17 Systems Based on SAP NetWeaver AS for ABAP 7.52 only: Switching to Standalone Enqueue Server 2 and Enqueue Replicator 2

If you installed a high-availability SAP system based on SAP NetWeaver AS for ABAP 7.52, you can switch to “Standalone Enqueue Server 2” and “Enqueue Replicator 2”.

When installing an SAP system based on SAP NetWeaver AS for ABAP 7.52 or lower, Software Provisioning Manager 1.0 installs the ASCS instance with the classic “Standalone Enqueue Server” and the ERS instance with the classic “Enqueue Replication Server” by default. However, if you installed an SAP system based on SAP NetWeaver AS for ABAP 7.52, you can switch to “Standalone Enqueue Server 2” and “Enqueue Replicator 2”.

For more information, see https://help.sap.com/nw752abap

Related Information

Enqueue Replication Server in a Microsoft Failover Cluster [page 194]
Configuring the First Cluster Node [page 203]
6.18 SAP Solution Manager 7.2, SAP Process Integration 7.5 only: Enabling HTTPS Communication for ABAP

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

Prerequisites

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

Procedure

Proceed as described in the SAP Note 510007.

Related Information

Additional Parameters when Installing SAP Process Integration 7.5 or SAP Solution Manager 7.2 [page 62]

6.19 Installing Additional Languages and Performing Language Transport

This section describes how to install and transport additional languages.

i Note

You do not have to perform these steps or at least some of these steps if you are using a Stack XML file (see Installation Using a Stack XML File [page 38]) and processed the Install Additional Languages screen during the installation.
Context

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

Procedure

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

   For more information, see SAP Note 42305.

2. Perform the language transport using transaction SMLT:

   a. Classify the language.
   b. Schedule the language transport.
   c. Schedule the language supplementation.

Next Steps

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

• Install the Support Packages again.
• Use the report RSTLAN_IMPORT_OCS to extract the language-relevant information from each Support Package.
6.20 Configuring the User Management

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

i Note

For SAP Process Integration 7.5 and SAP Solution Manager configuring the user management with an external ABAP system is mandatory. For more information, see Preparing an External ABAP System as Source for User Data in the Java installation guide for your operating system and database.

For SAP Process Integration 7.5 and SAP Solution Manager go to PI 7.5: Configuring the Process Integration System After the Installation respectively Configuring an SAP Solution Manager System in the Java installation guide for your operating system and database.

Context

For Solution Manager and Process Integration 7.5, your UME has been configured with the ABAP part of the system during the target system installation. For other SAP system products this configuration is optional. For more information, see Preparing an External ABAP System as Source for User Data in the Java installation guide for your operating system and database.

Procedure

After the installation of your SAP system has finished, you must decide whether you want to do the following:
• Add the system to Central User Administration (CUA)
• Use Lightweight Directory Access Protocol (LDAP) synchronization

For more information, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw75">https://help.sap.com/nw75</a></td>
<td>➤ Integration of User Management in Your System Landscape</td>
</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td>➤ Adding an ABAP System to Your System Landscape</td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

### 6.21 Ensuring User Security

You need to ensure the security of the users that the software provisioning manager created during the installation.

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

- Operating system users
- SAP system users

During the installation, the software provisioning manager by default assigned the master password [page 50] to all users created during the installation unless you specified other passwords.

**Recommendation**

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

**Recommendation**

In all cases, the user ID and password are encoded only when transported across the network. Therefore, we recommend using encryption at the network layer, either by using the Secure Sockets Layer (SSL) protocol for HTTP connections, or Secure Network Communications (SNC) for the SAP protocols dialog and RFC.
⚠️ Caution
Make sure that you perform this procedure **before** the newly installed SAP system goes into production.

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

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

---

### Operating System and Database Users

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

<table>
<thead>
<tr>
<th>User Type</th>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system user</td>
<td>&lt;sapsid&gt;adm</td>
<td>SAP system administrator</td>
</tr>
<tr>
<td></td>
<td>SAPService&lt;sapsid&gt;</td>
<td>User to run the SAP system</td>
</tr>
<tr>
<td>SAP HANA database user</td>
<td>SAP&lt;sapsid&gt;</td>
<td>SAP HANA database owner</td>
</tr>
</tbody>
</table>

**SAP Host Agent User**

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

---

### SAP System Users

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

**Note**

Client 066 is no longer available in newly installed SAP systems based on SAP NetWeaver 7.5 or higher. For more information, see SAP Note [1749142](https://help.sap.com/).
Client 001 is no longer available in newly installed SAP systems based on SAP S/4HANA and SAP BW/4HANA.

### SAP System Users

<table>
<thead>
<tr>
<th>User</th>
<th>User Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP system user</td>
<td>SAP*</td>
<td>User exists in at least SAP system clients 000, 001, and 066.</td>
</tr>
<tr>
<td>DDIC</td>
<td></td>
<td>User exists in at least SAP system clients 000 and 001.</td>
</tr>
<tr>
<td>EARLYWATCH</td>
<td></td>
<td>User exists in at least SAP system client 066.</td>
</tr>
</tbody>
</table>

**Application Server Java Administrator**

This user has only been created if you have installed the application server ABAP for an SAP Process Integration (PI) 7.5 system or for an SAP Solution Manager 7.2 system.

The name that you gave this user during the installation or the default name J2EE_ADMIN (see SAP System Parameters [page 50]).

This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It has administrative permissions for user management.

The password of this user is stored in secure storage. Therefore, whenever you change the password of the administrator password, you must also change the password in secure storage.

→ Recommendation

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

**Application Server Java Guest**

This user has only been created if you have installed the application server ABAP for an SAP Process Integration (PI) 7.5 system or for an SAP Solution Manager 7.2 system.

The name that you gave this user during the installation or the default name J2EE_GUEST (see SAP System Parameters [page 50]).

This user exists in at least clients 000 and 001 of the ABAP system and in the User Management Engine (UME) of the Java system. It is used for anonymous access.
### 6.22 Performing the Client Copy

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

**Context**

The software provisioning manager creates three ABAP clients during the installation, client 000, client 001, and client 066.

**i Note**

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

**i Note**

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

Use client 000 as source client for the client copy.

**i Note**

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

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

Next Steps

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

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
</table>
| • SAP NetWeaver 7.3 including Enhancement Package 1  
| • SAP NetWeaver 7.4  
  http://help.sap.com/nw74 | ➤ Application Help ➤ Function-Oriented View ➤ Application Server ➤ Application Server ABAP ➤ Administration of Application Server ABAP ➤ Change and Transport System ➤ BC – Client Copy and Transport |
| • SAP NetWeaver 7.5  
  http://help.sap.com/nw75 | ➤ Application Help ➤ Function-Oriented View ➤ Application Server ➤ Application Server ABAP ➤ Administration of Application Server ABAP ➤ Change and Transport System ➤ BC – Client Copy and Transport |
| • SAP NetWeaver Application Server for ABAP 7.51 innovation package  
  https://help.sap.com/nw751abap | ➤ Application Help ➤ Function-Oriented View ➤ Application Server ➤ Application Server ABAP ➤ Administration of Application Server ABAP ➤ Change and Transport System ➤ BC – Client Copy and Transport |
| • SAP NetWeaver AS for ABAP 7.52  
  https://help.sap.com/nw752abap | ➤ Application Help ➤ Function-Oriented View ➤ Application Server ➤ Application Server ABAP ➤ Administration of Application Server ABAP ➤ Change and Transport System ➤ BC – Client Copy and Transport |

6.23 Installation or Upgrade of SAP HANA Studio

Here you find documentation about how to install or upgrade the SAP HANA Studio.  
To install or upgrade SAP HANA studio, see the documentation SAP HANA Studio Installation and Update Guide at https://help.sap.com/viewer/p/SAP_HANA_PLATFORM ➤ Installation and Upgrade.
6.24 Backing Up the SAP HANA Database

We recommend that you back up the SAP HANA database after the installation has completed.

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


Alternatively, as of SAP HANA 2.0, you can use the SAP HANA cockpit to do so. For more information, see section Backup and Recovery of the documentation SAP HANA Administration with SAP HANA Cockpit, which you can find here:


Note
Make sure that you perform a “Complete Data Backup”.

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

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

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

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

→ Recommendation

SAP recommends using an individual encryption key.
For the secure storage in the file system, the key change is described in the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
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<tr>
<td>• SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
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<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
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</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

More Information

See also the entry Individual Encryption Key for the Secure Storage in table SAP System Parameters in SAP System Parameters [page 50].
6.26 Performing a Full System Backup

You must perform a full system backup, including the operating system disk, system state, and all other disks, after the configuration of your SAP system. If required, you can also perform a full system backup after the installation (recommended). In addition, we recommend you to regularly back up your database.

Prerequisites

- You are logged on as user <sapsid>adm.
- You have shut down the SAP system and database.

Procedure

For more information about backing up your SAP system on Windows, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Application Help ▶ Function-Oriented View ▶ Solution Life</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td></td>
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<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
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<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51</td>
<td></td>
</tr>
<tr>
<td>innovation package</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw751abap">http://help.sap.com/nw751abap</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
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<tr>
<td><a href="http://help.sap.com/nw752abap">http://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>
6.27 Logging on to the SAP Web Dispatcher Management Console

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

Context

Note

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

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

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

Procedure

1. Open a web browser.
2. Enter the following URL, depending on whether you use HTTP or HTTPS:

   http(s)://<Webdispatcher_Host>:<HTTP(S)_PORT>/sap/wdisp/admin/public/default.html

   Example


3. Log on as user webadm with the password that you entered during the input phase of the installation.

   The SAP Web Dispatcher Monitor screen appears.

4. We recommend that you change the password of webadm immediately after the installation for security reasons.
For more information on how to change passwords of existing users using the Admin Handler, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quicklink</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
</table>
| • SAP NetWeaver 7.3 including Enhancement Package 1  
  http://help.sap.com/nw731 | Application Help ➔ Function-Oriented View ➔ Application Server ➔ Application Server Infrastructure ➔ Components of SAP NetWeaver Application Server ➔ SAP Web Dispatcher ➔ Administration of the SAP Web Dispatcher ➔ Area menu ➔ Section "HTTP Handler" |
| • SAP NetWeaver 7.4  
  http://help.sap.com/nw74 | |
| • SAP NetWeaver 7.5  
  http://help.sap.com/nw75 | |
| • SAP NetWeaver Application Server for ABAP 7.51 innovation package  
  https://help.sap.com/nw751abap | |
| • SAP NetWeaver AS for ABAP 7.52  
  https://help.sap.com/nw752abap | |

Related Information

ASCS Instance with Embedded SAP Web Dispatcher [page 32]

6.28 SAP Web Dispatcher Configuration (Optional)

After installing SAP Web Dispatcher, you must configure it to be able to use it.

**i Note**

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

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

ASCS Instance with Embedded SAP Web Dispatcher [page 32]

6.29 Gateway Configuration

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

i Note

This step is only relevant if you installed a gateway embedded in the ASCS instance. For more information, see ASCS Instance with Embedded Gateway [page 34].

You can find all relevant configuration information in the gateway documentation in the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quicklink</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1 <a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
<td>Application Help &gt; SAP NetWeaver Library: Function-Oriented View &gt; Application Server &gt; Application Server Infrastructure &gt; Connectivity &gt; Gateway</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4 <a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5 <a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
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<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package <a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAP NetWeaver AS for ABAP 7.52 <a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
</tr>
</tbody>
</table>
SAP Release and SAP Library Quicklink

- SAP NetWeaver 7.4
  http://help.sap.com/nw74
- SAP NetWeaver 7.5
  http://help.sap.com/nw75
- SAP NetWeaver Application Server for ABAP 7.51 innovation package
  https://help.sap.com/nw751abap
- SAP NetWeaver AS for ABAP 7.52
  https://help.sap.com/nw752abap

SAP Library Path (Continued)

Application Help ➤ SAP NetWeaver Library: Function-Oriented View ➤ Application Server ➤ Application Server Infrastructure ➤ Components of SAP NetWeaver Application Server ➤ Gateway

Related Information

ASCS Instance with Embedded Gateway [page 34]
7 Additional Information

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

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

7.1 Integration of LDAP Directory Services

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

⚠️ Caution

SAP recommends that you no longer use the LDAP configuration options provided by the software provisioning manager, because current security guidelines make it unsafe to run SAP applications on a domain controller. Instead, SAP recommends that you follow the instructions in SAP Note 3251648 to enable LDAP directory service integration of your SAP system with Active Directory.

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

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

ℹ️ Note

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

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

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

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td>Application Help &gt; Function-Oriented View &gt; Security</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
<td>&gt; Identity Management &gt; User and Role Administration of</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td>Application Server ABAP &gt; Configuration of User and Role</td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td>Administration &gt; Directory Services &gt; LDAP Connector</td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
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</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
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<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
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<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
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<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

### Prerequisites

You can only configure the SAP system for Active Directory services or other LDAP directories if these are already available on the network. 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.

### 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 SAP Logon in the sapmsg.ini configuration file to find SAP systems and their message servers from the directory. If you configure SAP logon to use the LDAP directory, it queries the directory each time Server or Group selection is chosen to fetch up-to-date information on available SAP systems.
To use LDAP operation mode, check that the sapmsg.ini file contains the following:

```
[Address]
Mode=LDAPdirectory
LDAPserver=
LDAPnode=
LDAPoptions=
```

Distinguish the following cases:

- If you use an Active Directory, you must set `LDAPoptions="DirType=NT5ADS"`. For more information, see the SAP system profile parameter `ldap/options`.
- You must specify the directory servers (for example, `LDAPserver=pcintel6 p24709`) if one of the following is true:
  - The client is not located in the same domain forest as the Active Directory
  - The operating system does not have a directory service client (Windows NT and Windows 9X without installed `dsclient`).
    For more information, see the SAP system profile parameter `ldap/servers`.
- For other directory services, you can use `LDAPnode` to specify the distinguished name of the SAP root node. For more information, see the SAP system profile parameter `ldap/saproot`.

**SAP MMC**

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

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

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

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

**SAP MC**

You can also use the SAP Management Console (SAP MC) for administering and monitoring SAP systems from a central location.
For more information about the SAP MC and about how to configure it to access LDAP directories, see the documentation *SAP Management Console* in the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td><img src="http://help.sap.com/nw731" alt="Access" /></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td><img src="http://help.sap.com/nw75" alt="Access" /></td>
</tr>
<tr>
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<td><img src="http://help.sap.com/nw752abap" alt="Access" /></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 software provisioning manager to automatically:

⚠️ **Caution**

SAP recommends that you no longer use the LDAP configuration options provided by the software provisioning manager, because current security guidelines make it unsafe to run SAP applications on a domain controller. Instead, SAP recommends that you follow the instructions in SAP Note 3251648 to enable LDAP directory service integration of your SAP system with Active Directory.

• Extend the Active Directory schema to include the SAP-specific data types
• Create the domain accounts required to enable the SAP system to access and modify the Active Directory. These are the group *SAP_LDAP* and the user *sapldap*.
• Create the root container where information related to SAP is stored
• Control access to the container for SAP data by giving members of the *SAP_LDAP* group permission to read and write to the directory


⚠️ **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. The software provisioning manager software contains schema extensions for directory servers Netscape/iPlanet (ldregns4.txt, ldregns5.txt) and OpenLDAP slapd (ldregslapd.schema). Both files are located...
in the directory `<Unpack_Directory>`\COMMON\ADS. After you have applied the schema extension, you need to create a root container to store the SAP-related information and create a directory user that the SAP application server can use to write information to the directory.

For more information about how to set up a Netscape/iPlanet directory server, see the documentation SAP System Information in Directory Services at: https://archive.sap.com/documents/docs/DOC-14384

- **Enabling the SAP System LDAP Registration**
  Once you have correctly configured your directory server, you can enable the LDAP registration of the SAP system by setting some profile parameters in the default profile.
  To do this, run the software provisioning manager [page 101] once for your system and choose:

  △ **Caution**

  SAP recommends that you no longer use the LDAP configuration options provided by the software provisioning manager, because current security guidelines make it unsafe to run SAP applications on a domain controller. Instead, SAP recommends that you follow the instructions in SAP Note 3251648 to enable LDAP directory service integration of your SAP system with Active Directory.

### 7.2 SAP Directories

This section describes the directories that are available in an SAP system.

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

If you want to install a high-availability system, see also Directories in a Microsoft Failover Cluster Configuration [page 197].

End of 'High Availability': HA (Windows)

The software provisioning manager automatically creates the following directories during the installation:

- `\usr\sap`  
  This directory is created on the:
  - Global host and shared with the network share `sapmnt`

Only valid for 'High Availability': non-HA

In a non-high-availability-system, you can install the primary application server instance or the (A)SCS instance on the global host or on any other host.

End of 'High Availability': non-HA

On global hosts, the `\usr\sap` directory contains general SAP software, global, and local (instance-specific) data.
For this, the software provisioning manager creates the global directory `\usr\sap\<SAPSID>\SYS`, which physically exists only once for each SAP system. It consists of the following subdirectories:

- **global** – contains globally shared data
- **profile** – contains the profiles for all instances
- **exe** – contains executable replication directory for all instances and platforms

During the installation of an SAP system distributed over several hosts, you can now specify that the SAP Global directories are installed on a host different from the ASCS instance host. For more information, see SAP Note 3349121.

- **Local host and shared** with the name `saploc`.

  In a high availability system this directory is located on a local disk. You have at least two disk drives with a `\usr\sap` directory structure.

On local hosts, the `\usr\sap\<SAPSID>\<Instance_Name>` directory contains copies of the SAP software and local (instance-specific) data.

- **Note**
  - Since SAP traces for the instance are created in `\usr\sap`, make sure that there is sufficient space available in this directory. Changes in SAP profiles can also affect the disk space.
  - The executables on the local host are replicated from those on the global host every time the local instance is started. The SAP copy program `sapcpe` compares the binaries in the `<Platform>` directory on the global host and the binaries in the `exe` directory on the application server. If the binaries in the `exe` directory are older than those in the `<Platform>` directory, `sapcpe` replaces them with the newer version of the global host.

Other application servers access the global data using the Universal Naming Convention (UNC) path `\\<SAPGLOBALHOST>\sapmnt`. The SAP programs access their instance-specific data with the UNC path `\\<SAPLOCALHOST>\saploc`. If the UNC path points to a local directory, the local path (and not the UNC path) is used to access the directory.

The parameters `SAPGLOBALHOST` and `SAPLOCALHOST` have the **same** values on the global host.

- **Note**
  - In a high-availability system, file shares pointing to directories on shared disks are only visible or can be accessed with the virtual host name of the cluster group the shared disks belong to.

- **\usr\sap\trans**
  - The transport directory contains SAP software for the transport of objects between SAP systems. The software provisioning manager by default creates it on the `SAPGLOBALHOST`. If you want to have it created on another host, or if you want to use an already existing transport host of your SAP system landscape, you can specify another host during the installation. In this case, you have to prepare that host to allow the new SAP system to use it as transport host. For more information, see Preparing the SAP System Transport Host [page 75].
Directory Structure

The following figures show how the physical directory \usr\sap is shared on the global host in a standard and in a distributed system. In both cases, the UNC paths are used as follows:

- `\<SAPGLOBALHOST>\sapmnt` to access global directories
- `\<SAPLOCALHOST>\saploc` to access local instance-specific data

**Note**

There are the following instance names available in an SAP system:

- **ABAP central services instance**: ASCS<Instance_Number>
- **SAP systems based on SAP NetWeaver 7.3 EHP1 to 7.4**: Primary application server instance: DVEBMGS<Instance_Number>
- **SAP systems based on SAP NetWeaver 7.5 and higher**: Primary application server instance: D<Instance_Number>
- **Additional application server instance**: D<Instance_Number>

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

**High Availability only**: Enqueue Replication Server instance: ERS<Instance_Number>

End of 'High Availability': HA (Windows)

**Directory Structure on the Global Host in a Standard (Central) ABAP System for SAP Systems Based on SAP NetWeaver 7.5 and higher**

On the global host in a standard (central) ABAP system for SAP systems based on SAP NetWeaver 7.5 and higher, all application server instances, including the primary application server instance, are named D<Instance_Number>.
Directory Structure on the Global Host in a Standard (Central) ABAP System for SAP Systems Based on SAP NetWeaver 7.3 EHP1 to 7.4

For the global host in a standard (central) ABAP system for SAP systems based on SAP NetWeaver 7.3 EHP1 to 7.4, the primary application server instance is named DVEBMGS<Instance_Number>.
Directory Structure on the Global Host in a Standard (Central) ABAP System for SAP Systems Based on SAP NetWeaver 7.3 EHP1 to 7.4

Directory Structure for a Distributed ABAP System
7.3 Performing a Domain Installation Without Being a Domain Administrator

It is not required to perform the installation of the SAP system with a user who is a member of the Domain Admins group. For security reasons most customers do not provide this permission to SAP or database administrators. If the Domain Admin right has been granted, you can start any SAP installation because the user will have all necessary rights to install a standard, distributed or high-availability system.

An alternative is to ask the domain administrator to grant the required permissions to the user which installs SAP or the database. This domain user must be a member of the local Administrators group. In most cases the domain administrator will define an OU (Organizational Unit) structure, where all SAP systems and their related domain objects belong to.

To perform the installation with a domain user, the user account must meet the following requirements:

1. Create/Delete/Modify Users and Groups within OUs only. Ask the AD administrator about the company’s OU concept.
2. Create/Delete/Modify Computer Objects within this OU. This is required for users which install SAP or database applications in Failover Clusters, SAP Landscape Management environments or other high-availability (HA) environments.
   Optional rights might be necessary related to your company’s security policy, for example:
3. Create/Delete/Modify DNS server records within a specific DNS zone, where the Windows hosts with SAP software belong to.
4. Create/Delete/Modify Organizational Unit objects within a specific OUs only.

For standard and distributed installations (not HA installations!) the domain administrator can prepare the user and group objects in the domain for you. In this case, the domain user which will be used for the installation does not need any of the above permissions.
The required objects in the domain are:

1. Domain group SAP_<SAPSID>_GlobalAdmin
   The group scope should be GLOBAL, the group type should be SECURITY.
2. Two new SAP system users <sapsid>adm and SAPService<SAPSID>.
3. The users <sapsid>adm and SAPServiceSAPSID must be members of the domain group SAP_<SAPSID>_GlobalAdmin.

**i Note**
The software provisioning manager creates the operating system user for the SAP Host Agent by default as a local user that is not a member of the local Administrators group. If you want to create this user manually as a domain user, you must perform the following steps:

Creating the SAP Host Agent User and Group Manually
1. Create the new global group SAP_GlobalAdmin
2. Create the SAP system user sapadm.
3. Add the user sapadm to the newly created group SAP_GlobalAdmin.

However, for security reasons we strongly recommend that you create this user as a local user.

### 7.4 Checking and Changing the Paging File Settings on Windows Server

This section describes how to check and change the paging file size on Windows Server with PowerShell. The PowerShell commands also work in previous Windows versions where PowerShell is available.

**i Note**
Some paging file operations require a reboot of the server to activate the changes you made. Wmi-commands do not indicate whether a reboot is required or not. Therefore, we recommend rebooting your system every time you change the paging file settings with PowerShell.

**Prerequisites**
Always start the PowerShell in elevated mode (run as administrator).

**Procedure**
Checking the Size of a Paging File
2. Check whether the default value *Automatic manage pagefile size for all devices* is activated.

Note

We do not support automatically managed page file sizes.

To check this, enter the following command:

```powershell
(Get-WmiObject Win32_Pagefile) -eq $null
```

If *Automatic manage pagefile size for all devices* is enabled, the output value is `True`.

If necessary, disable *Automatic manage pagefile size for all devices* with the following command:

```powershell
$sys = Get-WmiObject Win32_Computersystem -EnableAllPrivileges
$sys.AutomaticManagedPagefile = $false
$sys.put()
```

3. Check the size of the paging files with the following command:

```powershell
Get-WmiObject WIN32_Pagefile | Select-Object Name, InitialSize, MaximumSize, FileSize
```

The output looks like the following:

<table>
<thead>
<tr>
<th>Name</th>
<th>InitialSize</th>
<th>MaximumSize</th>
</tr>
</thead>
<tbody>
<tr>
<td>C:\pagefile.sys</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>E:\pagefile.sys</td>
<td>40000</td>
<td>80000</td>
</tr>
</tbody>
</table>

In this example, in the first line, the *InitialSize* and *MaximumSize* values of a paging file are 0, which means that the paging file size is *system managed* (not recommended).

In the second line, the paging file size has a minimum and a maximum size (recommended).

### Changing the Size of a Single Paging File

Changing the *InitialSize* and *MaximumSize* values of a paging file to a size other than 0, will automatically switch off *system managed size*.

In the following example, we change the size of the paging file on *C*: to the *InitialSize* of 40 GB and to the *MaximumSize* of 80 GB.

Use the following commands in a PowerShell:

```powershell
$Pagefile = Get-WmiObject Win32_PagefileSetting | Where-Object {$_..name -eq "C:\pagefile.sys"}
$Pagefile.InitialSize = 40000
$Pagefile.MaximumSize = 80000
$Pagefile.put()
```

Typically, you choose the same value for *InitialSize* and *MaximumSize*.

Note

The sum of all paging files *InitialSize* values must be equal to or higher than the value recommended for your SAP system.
Creating a Second Paging File on Another Disk

You might want to create a second or additional paging files to improve system performance, or if your disk does not have enough space.

To do so, enter the following commands in a PowerShell:

```powershell
$Pagefile = Get-WmiObject Win32_PagefileSetting
$pagefile.Name = "E:\pagefile.sys"
$pagefile.Caption = "E:\pagefile.sys"
$pagefile.Description = "pagefile.sys @ E:\"
$pagefile.SettingID = "pagefile.sys @ E:\"
$pagefile.InitialSize = 80000
$pagefile.MaximumSize = 80000
$pagefile.put()
```

Deleting a Paging File on a Specific Device

To delete a paging file, enter the following commands in a PowerShell:

```powershell
$pagefile = Get-WmiObject Win32_PagefileSetting | Where-Object {$_ -eq "E:\pagefile.sys"}
$pagefile.delete()
```

7.5 Installation of Multiple Components in One Database

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

→ Recommendation

MCOD is generally available and there is no intention to de-support this installation feature.

However, SAP recommends that customers should not use the MCOD feature when installing new systems.

The major drawbacks are as follows:

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

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

Additional information is available in SAP Note 2146542.

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

A productive SAP system with SAP HANA database cannot be an MCOD system. For more information about the supported MCOD systems with SAP HANA Database, see SAP Notes 1661202 and 1681092.

With MCOD we distinguish two scenarios:

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

**Prerequisites**

- For more information about MCOD and its availability on different platforms, see *Multiple Components in One Database (MCOD)* at: https://wiki.scn.sap.com/wiki/pages/viewpage.action?pageId=448465680.
- Since SAP does not support mixed solutions with MCOD, your SAP system must contain Unicode SAP instances only.
- Improved sizing required
  
  You calculate the CPU usage for an MCOD database by adding up the CPU usage for each individual SAP system. You can do the same for memory resources and disk space.
  
  You can size multiple components in one database by sizing each individual component using the Quick Sizer tool and then adding the requirements together. For more information about the Quick Sizer, see http://sap.com/sizing.

**Features**

- Reduced administration effort
- Consistent system landscape for backup, system copy, administration, and recovery
- Increased security and reduced database failure for multiple SAP systems due to monitoring and administration of only one database
- Independent upgrade

  In an MCOD landscape, you can upgrade a single component independently from the other components running in the same database, assuming that the upgraded component runs on the same database version. However, if you need to restore a backup, be aware that all other components are also affected.

**Note**

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

- We **strongly recommend** that you test MCOD in a test or development system. We recommend that you run MCOD systems in the same context. We do not recommend that you mix test, development, and production systems in the same MCOD.
- In the event of database failure, all SAP systems running on the single database are affected.
- Automated support in an MCOD landscape for the following administrative tasks depends on your operating system and database:
  - Copying a single component from an MCOD landscape to another database at database level.
  - Uninstalling a single component from an MCOD landscape requires some additional steps. You can use a remote connection to SAP support to request help with these tasks. For more information, see [http://support.sap.com/remotecollection](http://support.sap.com/remotecollection).
- You **cannot** install a Unicode ABAP system with a non-Unicode ABAP system in one database.
- Only valid for 'High Availability': HA (Windows)
  You **cannot** install multiple components in one database with Microsoft Failover Clustering. For more information, see [High Availability with Microsoft Failover Clustering](page 185).
- For the first SAP system, the database system ID can be different from the SAP system ID.
- For the second SAP system, you must use the same `<DBSID>` as for the first SAP system.
- If you decide to turn off database logging during the database load phase of the installation, you need to plan downtime for all MCOD systems sharing the database.

7.6 Installing the SAP Host Agent Separately

The SAP Host Agent is installed automatically during the installation of new SAP instances with SAP kernel 7.20 or higher (embedded installation). If you need to install the SAP Host Agent separately, use the documentation [Installation of SAP Host Agent on Windows - Using Software Provisioning Manager 1.0](https://support.sap.com/sltoolset) at:

https://support.sap.com/sltoolset >> System Provisioning >> Install a System using Software Provisioning Manager >> Installation Option of Software Provisioning Manager 1.0 SP <<Current Version> >> Installation Guides - Standalone Engines and Clients >> SAP Host Agent

7.7 Starting and Stopping the SAP System

You use this procedure to start and stop the SAP system or single instances after the installation with the SAP Microsoft Management Console (SAP MMC) or SAPControl.
Prerequisites

The user who wants to start and stop the SAP system with the SAP MMC, must be a member of the local administrators group.

Procedure

Starting and Stopping the SAP System with the SAP MMC

With the SAP MMC, you can start or stop installed SAP instances – except the database instance – locally on the host that you are logged on to. If the SAP MMC is configured for central system administration, you can start or stop the entire system from a single host.

i Note

- To stop the database instance you must use the relevant database administration tools.
- You can also start and stop a UNIX system with the SAP MMC.
- The SAP MMC is not available on Windows Server Core.
For more information about the SAP MMC, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td><img src="#" alt="Application Help" /> ➤ <img src="#" alt="Function-Oriented View" /> ➤ <img src="#" alt="Solution Life Cycle Management" /> ➤ <img src="#" alt="SAP Microsoft Management Console" /> ➤ <img src="#" alt="Windows" /></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw731">http://help.sap.com/nw731</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.4</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw74">http://help.sap.com/nw74</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td><a href="http://help.sap.com/nw75">http://help.sap.com/nw75</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw751abap">https://help.sap.com/nw751abap</a></td>
<td></td>
</tr>
<tr>
<td>• SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
<tr>
<td><a href="https://help.sap.com/nw752abap">https://help.sap.com/nw752abap</a></td>
<td></td>
</tr>
</tbody>
</table>

To start or stop the SAP system – except the database instance – with the SAP MMC, perform the following steps:

1. Start the SAP MMC on the SAP system host.
2. Right-click the SAP system node and choose **Start** or **Stop**.
   
   All SAP instances listed under the system node start or stop in the correct order.
3. To stop the database instance, use the relevant database administration tools.
4. If the SAP system is installed on multiple hosts, you have the following options to start or stop your system:
   
   • You start or stop the SAP instances – except the database instance – using the SAP MMC on each host.
   
   • You add the remote instances to the SAP MMC configuration to start or stop all instances from a single SAP MMC.
   
   To do so, do one of the following:
   
   • You configure the SAP MMC manually. For more information, see *Changing the Configuration of the SAP MMC* in the SAP MMC documentation.
   
   • You use the automatic LDAP registration. For more information, see *Configuring SAP MMC for Active Directory Services* in the SAP MMC documentation.

**Starting and Stopping the SAP System with SAPControl**

To start or stop the SAP system – except the database instance – with SAPControl (*sapcontrol.exe*), perform the following steps:

- To start or stop the complete SAP system with SAPControl, open a PowerShell in elevated mode, and enter the following command:
  
  `sapcontrol -prot PIPE -nr <Instance_Number> -function StartSystem`
  
  `sapcontrol -prot PIPE -nr <Instance_Number> -function StopSystem`

- To start or stop a single instance with SAPControl, open a PowerShell in elevated mode, and enter the following command:
  
  `sapcontrol -prot PIPE -nr <Instance_Number> -function Start`
  
  `sapcontrol -prot PIPE -nr <Instance_Number> -function Stop`

- To stop the database instance, use the relevant database administration tools.
7.8 Configuring the Windows Server Firewall after SAP installation

Use

In Windows Server the firewall is configured to allow only a small set of Windows-specific inbound IP connections.

Therefore, we recommend that you do not turn on the Windows firewall after you have installed your SAP system. Instead, we recommend that you secure network access to your SAP system with the physical firewall or a router Access Control List (ACL) within your datacenter.

If, for some reason, you want to use the Windows Server firewall, you have to configure the Windows firewall and define a set of Inbound Rules for the TCP/IP port numbers that are used by your system. Otherwise, your SAP system might not operate.

For more information about the port numbers used, see the documentation TCP/IP Ports of All SAP Products at: https://help.sap.com/viewer/ports.

Ports listed with the default value Not active in this document are not configured.

<table>
<thead>
<tr>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>You turn on the disabled firewall [page 70] as follows:</td>
</tr>
<tr>
<td>• Open Windows PowerShell in elevated mode, and enter the following command: Set-NetFirewallProfile &quot;public&quot;, &quot;domain&quot;, &quot;private&quot; -enabled true</td>
</tr>
<tr>
<td>• You turn on the disabled firewall as follows: Open Windows PowerShell in elevated mode, and enter the following command: Set-NetFirewallProfile &quot;public&quot;, &quot;domain&quot;, &quot;private&quot; -enabled true</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>This procedure provides an example how to set Inbound Rules for the ports of an ABAP server that was installed with the following settings: Instance number 00</td>
</tr>
</tbody>
</table>
Port type: TCP

<table>
<thead>
<tr>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>3200, 3300, 4800, 8000, 3600, 50013, 1433, 1434</td>
</tr>
</tbody>
</table>

- Open Windows PowerShell in elevated mode, and enter the following command:
  `New-NetFirewallRule -DisplayName "SAP ABAP Server 00" -Direction Inbound -Protocol TCP -LocalPort 3200,3300,4800,8000,3600,50013,1433,1434 -Action Allow`

- You turn on the disabled firewall as follows:
  Open Windows PowerShell in elevated mode, and enter the following command:
  `Set-NetFirewallProfile "public","domain","private" -enabled true`

**Note**

If you want to use, for example, a different IP scope for port 50013, which is used by the connection SAP Start Service – SAP Management Console, you can restrict the IP access to a small number of SAP administrators. Then delete this port from the SAP ABAP Server 00 rule and create a new rule for port 50013 with a more restrictive scope.

### 7.9 SAP System Security on Windows

In a standard SAP system installation, the software provisioning manager automatically performs all steps relevant for security. Although the software provisioning manager makes sure that the system is protected against unauthorized access, you must still check that no security breaches can occur.

For central and straightforward administration of the SAP system, you have to install distributed SAP systems with multiple application servers in a Windows domain. This section describes the user accounts and groups that the software provisioning manager creates during a domain installation and shows how these are related to the SAP directories.

**User Accounts**

The software provisioning manager creates the following accounts for SAP system administration:

<table>
<thead>
<tr>
<th>User account</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;sapsid&gt;adm</td>
<td>This is the SAP system administrator account that enables interactive administration of the system.</td>
</tr>
<tr>
<td>SAPService&lt;SAPSID&gt;</td>
<td>This is the user account that is required to start the SAP system. It has the local user right to log on as a service. The advantage of the additional SAPService&lt;SAPSID&gt; account is that it does not allow interactive logon, which prevents abuse of the account. Therefore, you do not need to set an expiration date for the password and you do not have to set the option <strong>user must change password at next logon</strong>.</td>
</tr>
</tbody>
</table>
User account | Description
--- | ---
sapadm | This is the user for the SAP Host Agent. By default it is a local user and not a member of the local Administrators group. You can change this user into a domain user on the Parameter Summary screen. For security reasons, however, SAP strongly recommends to create this user as a local user.

The SAP Host Agent contains all of the required elements for centrally monitoring any host with the Alert Monitor or the SAP NetWeaver Administrator.

Domain and Local Groups

The only function of a domain group is to group users at the domain level so that they can be placed in the appropriate local groups.

Only local groups are created and maintained on each local host. A local group can only be given permissions and rights to the system where it is located. The system is part of a particular domain, and the local group can contain users and domain (global) groups from this domain.

During a domain installation, the software provisioning manager creates the following domain and local groups:

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP_&lt;SAPSID&gt;_GlobalAdmin</td>
<td>This domain (global) group is a domain-level SAP administration group for organizing SAP system administrators.</td>
</tr>
<tr>
<td>SAP_SAP_GlobalAdmin</td>
<td>This domain group for the SAP Host Agent is only created if you create the SAP Host Agent user sapadm as a domain user.</td>
</tr>
<tr>
<td>SAP_&lt;SAPSID&gt;_LocalAdmin</td>
<td>This local group is created on each host.</td>
</tr>
<tr>
<td>SAP_SAP_LocalAdmin</td>
<td>If you create the SAP Host Agent user as domain user, the group SAP_SAP_LocalAdmin is also created.</td>
</tr>
<tr>
<td>SAP_LocalAdmin</td>
<td>This local group is created on all hosts, but is particularly important for the transport host. Members of the group have full control over the transport directory (\usr\sap\trans) that allows transports to take place between systems.</td>
</tr>
</tbody>
</table>

SAP Directories

The software provisioning manager protects the SAP directories under \usr\sap\<SAPSID> by only granting the group SAP_<SAPSID>_LocalAdmin full control over these directories.

The following graphic illustrates the users and groups that are created by the software provisioning manager for the <sapsid>adm and SAPService<SAPSID> users in a system infrastructure consisting of two SAP systems.
An access control list (ACL) controls access to SAP system objects. For maximum security in the SAP system, only the following are members of all SAP system object ACLs:

- Local group `SAP_<SAPSID>_LocalAdmin`
- Group Administrators
- User `SYSTEM`

More Information

Automatic Creation of Accounts and Groups [page 180]

### 7.10 Automatic Creation of Accounts and Groups

The software provisioning manager automatically creates the accounts and groups required for the secure operation of the SAP system with Windows during the installation, as described in SAP System Security on Windows [page 178].

Features

The following figures show the steps that the software provisioning manager performs to create the users and groups and assign the required rights to SAP directories.
The first figure shows the users that are created during a domain installation, with the SAP Host Agent operating system users being local users.

### Creation of Accounts

<table>
<thead>
<tr>
<th>Domain users for SAP system &lt;sapsid&gt;</th>
<th>Local user for SAP Host Agent &lt;sapid&gt;</th>
</tr>
</thead>
</table>

### Creation and Modification of Domain Group in the Domain

- Creation of domain group `SAP_<SAPSID>_GlobalAdmin`
- Addition of `<sapsid>adm`, `<service>SAPSID` to `SAP_<SAPSID>_GlobalAdmin`

### Creation and Modification of Local Groups and Users on Each Host

- Creation of local groups `SAP_<SAPSID>_LocalAdmin`, `SAP_<SAPSID>_LocalAdmin`
- Creation of local group `SAP_GlobalAdmin`
- Addition of domain group `SAP_<SAPSID>_GlobalAdmin` to local group `SAP_<SAPSID>_LocalAdmin`
- Addition of `sapid` to `SAP_APP_GlobalAdmin` and `SAP_<SAPSID>_LocalAdmin`
- Creation of local group `SAP_LocalAdmin`
- Addition of domain group `SAP_<SAPSID>_GlobalAdmin` to local group `SAP_LocalAdmin`
- Addition of local user `sapid` to local group `SAP_LocalAdmin`

### Creating Users and Groups

For Administrators and SAP LocalAdmin groups
assignment of full control over:
```
user\<sapid>
user\<sapid>\trans
user\<sapid>\gsciolog
```

### Assigning Rights to SAP Directories

For Administrators and SAP `<SAPSID>` LocalAdmin groups
assignment of full control over:
```
user\<sapid>\<SAPSID>
```
7.11 Uninstalling an SAP System or Single Instances

This section describes how to uninstall a complete SAP system or single SAP instances with the *Uninstall* option of the software provisioning manager.

**Prerequisites**

- You have installed your SAP system with standard SAP tools according to the installation documentation.
- You are logged on with a user account that has the required authorization to run the software provisioning manager and the SAP system. For more information, see Required User Authorization for Running Software Provisioning Manager [page 73].

⚠️ **Caution**

Do **not** use the `<sapsid>adm` user to delete the SAP system.

- Make sure that the SAP system, or single instance, or standalone engine, or optional standalone unit to be deleted is down and that you are not logged on as one of the SAP system users. Also check that all SAP-related processes are stopped. If there is a lock on one of the SAP system objects, the uninstall fails.

ℹ️ **Note**

You do not have to stop the SAP Host Agent. The SAP Host Agent is stopped automatically during the uninstall process.

- When starting the uninstall, make sure that there are no SAP system user sessions still open.

**Context**

Note the following when deleting an SAP system or single instances:

- You cannot delete an SAP system remotely.
- If you delete network-wide users, groups or service entries in an environment with Network Information System (NIS), other SAP installations might also be affected. Make sure that the users, groups, and service entries to be deleted are no longer required.
- During the uninstall process, all file systems and subdirectories of the selected SAP system or single instance are deleted. Before you start uninstalling, check that you have saved a copy of all files and directories that you want to keep to a secure location.
- The uninstall process is designed to remove as much as possible of the SAP system to be deleted. If an item cannot be removed, a message informs you that you have to remove this item manually. You can do this either at once or after the uninstall process has finished. As soon as you confirm the message, the uninstall process continues.
- If you uninstall an SAP instance and you plan to install another SAP instance with the same System ID, first reboot the Windows host to clear all user cached information. For more information, see SAP Note 2296310.
Procedure

1. Start the software provisioning manager as described in Running Software Provisioning Manager [page 101].
2. On the Welcome screen, choose: 

   ![Generic Installation Options](Database) ![Uninstall](Uninstall) ![Uninstall SAP Systems or Single Instances](Uninstall)

3. Follow the instructions on the software provisioning manager screens to delete a complete SAP system or single instances.

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

The following table provides information about deleting a complete system or single instances with the software provisioning manager.

<table>
<thead>
<tr>
<th>Deletion of</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard system</td>
<td>You can delete a standard system (where all instances except the database instance reside on the same host) in one software provisioning manager run.</td>
</tr>
<tr>
<td>Distributed or high-availability system</td>
<td>If you want to delete a distributed or high-availability system, you have to run the software provisioning manager to delete the required instances locally on each of the hosts belonging to the SAP system in the following sequence:</td>
</tr>
</tbody>
</table>

   **Caution**
   Only select checkbox Uninstall all instances of the SAP system from this host when removing the last remaining instance of the SAP system. Otherwise, the contents of mounted global directories under `\<sapglobalhost>\sapmnt>\<SAPSID>` such as instance profiles and kernel executables, are also deleted.

   1. Additional application server instances, if there are any
   2. Primary application server instance
   - If the software provisioning manager stops responding while trying to delete the primary application server instance, close the software provisioning manager with Cancel and Exit. Log off and log on again. To complete the uninstall process of the primary application server instance, restart the software provisioning manager.
   3. Database instance
   - Do not delete the SAP HANA database instance. However, you can delete the database clients and the database users on the SAP application servers.
   4. ABAP Central services instance (ASCS)
## Deletion of Remarks

### Additional application server

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

### Standalone SAP Host Agent

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

If you want to uninstall a **standalone** SAP Host Agent, deselect **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. Delete the local user group `SAP_<SAPSID>_LocalAdmin` manually as follows:
   - Open a PowerShell in elevated mode and enter the following command:
     ```
     net localgroup SAP_<SAPSID>_LocalAdmin /delete
     ```

6. If required, you can delete the directory `\usr\sap\trans` and its contents manually.

   The software provisioning manager does not delete `\usr\sap\trans` because it might be shared.

8 High Availability with Microsoft Failover Clustering

You can install a high-availability SAP system with Microsoft Failover Clustering. The Failover Clustering software improves the availability of the system and protects it against failure and unplanned downtime, enabling 24-hour operation, 365 days a year.

With high availability, you enable critical system components, known as “Single Points of Failure (SPOFs)”, to be automatically switched from one machine to the other, if hardware or software problems arise on one machine. With the help of this switchover – or failover – the system can continue functioning.

Apart from enabling failover when hardware problems occur, you can also use Failover Clustering to avoid downtime when you perform essential system maintenance. If you need to maintain one host (failover cluster node), you can deliberately switch the cluster resources to the other host (failover cluster node) and temporarily operate it there while maintenance is in progress. When maintenance work is finished, you can easily move the resources back to their original node and continue operating them there.

When you are setting up the SAP system with Microsoft Failover Clustering, you combine standard installation steps, described earlier in this documentation, with cluster-specific steps, described here.

You have the following options to install a high-availability SAP system with Microsoft Failover Clustering:

• You install the SAP related parts (for example: ASCS instance, additional standalone Gateways, Web Dispatcher instance, etc.) in one Microsoft Failover Cluster.

• You install the SAP related parts (for example: ASCS instance, additional standalone Gateways, Web Dispatcher instance, etc.) in two Microsoft Failover Clusters.

You have the following options to install a Microsoft Failover Cluster:

• CSD (Cluster Shared Disks)
  • A Failover Cluster which contains shared disks. A database can be optionally installed in this Cluster in its own cluster group.

• FSC (File Share Cluster)
  • A Failover Cluster which does not contain shared disks and uses a remote file share instead. A database cannot be installed in this cluster because databases need shared disks. One exception: MS SQL using “AlwaysOn” option.

• **i Note**
  The user starting the software provisioning manager must have full access rights on the file share \\<sapglobalhost>\sapmnt.
You have the following options to install the database instance with a high-availability SAP system:

- You install the database instance on a different host or cluster on either the same or a different operating system.
- You use third-party high-availability solutions to improve the availability of your database instance.

**Important Information**

To install a new SAP system with Microsoft Failover Clustering, you have to perform a number of extra steps specially required for the cluster and configure the SAP system so that it can take advantage of the cluster functionality:

- Since the correct configuration of network addresses is absolutely essential for the cluster to function properly, you have to perform a number of additional steps that are necessary to set up and check address resolution.
- Since the cluster hardware has at least two nodes that have access to all local and shared storage devices, you have to install some components on all nodes and pay attention to special rules for distributing components to local disks, shared disks, or external file shares.
• You have to install and configure the ASCS instance to run on two cluster nodes in one Microsoft Failover Cluster.

**i Note**

If you have an existing SAP system and plan to migrate to a failover cluster with new hardware, you install the SAP system using a system copy.

For more information about the system copy, see the System Copy Guide for your SAP system at:

http://support.sap.com/sitoolset System Provisioning System Copy Option

The system copy guide does not include the cluster-specific information, which is described here.

**Terminology**

• In this documentation the hosts in a Microsoft Failover Cluster are referred to as first cluster node and additional cluster node(s):
  • The first cluster node is the cluster node where you perform the general installation of an SAP system, for example where the database or ASCS instance is to be installed.
  • The additional cluster node is the node where you configure the already installed SAP instances to run in Microsoft Failover Clustering.

**8.1 Checklist for a High-Availability System**

This section includes the steps that you have to perform for your SAP system using Microsoft Failover Clustering. Detailed information about the steps is available in the relevant section.

**Planning**

1. You check that you have completed the same planning activities [page 37] as for a non-HA system, including the hardware and software requirements [page 41].
2. You decide how to set up your SAP system components in an HA configuration [page 189].
3. You decide how to distribute SAP system components to disks for HA [page 195].
4. You read Directories in an HA Configuration [page 197].
5. You read IP Addresses in an HA Configuration [page 198].
6. You obtain IP addresses for HA [page 200].

**i Note**

The user starting the software provisioning manager must have full access rights on the file share \<sapglobalhost>\sapmnt.
Preparation

1. You check that you have completed the same preparations [page 68] as for a non-HA system.
2. To make sure that all preparation steps have been correctly performed, check that the storage resources are available to all cluster nodes. If you want to run the CSD option, check if you can move the disk resources from one cluster node to another so that they are accessible from a single node at any time. If you want to run the FSC option, check if the external file share is accessible by your installation user from all cluster nodes.

Installation

1. You make sure that:
   1. You are logged on as a domain administrator user or a domain user, who has the necessary rights on all cluster nodes. For a list of the required permissions, see Performing a Domain Installation without being a Domain Administrator [page 169].

   i Note
   In Failover Cluster configurations, make sure that the account of the cluster (<clusternam>$) has full rights in the OU (Organizational Unit) on which your Domain administrator configures the SAP users and the SAP group.

   If these rights are missing, the software provisioning manager will try to add the cluster network name resource to the SAP cluster group. However, because the cluster itself has no rights to add the related computer object (CNO) to the OU, the software provisioning manager will stop and show the error message <access denied>.

   2. You do not use the user <sapsid>adm unless specified.
   3. If you are prompted during the installation process, log off and log on again.

2. You configure the first cluster node [page 203].
3. You run the software provisioning manager on the first cluster node to install the database instance [page 205].
4. You configure the additional cluster node [page 206].
5. You install the primary application server instance [page 207].
6. You install at least one additional application server instance [page 208].

Post-Installation

1. You install the permanent SAP licenses on all cluster nodes.
2. You perform the post-installation checks for the enqueue replication server.
3. You perform the same post-installation steps [page 122] as for a non-HA system.
8.2 Planning

The following sections provide information about how to plan the installation of the SAP system for Microsoft Failover Clustering. For a complete list of all steps, see section Planning in the Installation Checklist for a High-Availability System [page 187].

8.2.1 System Configuration with Microsoft Failover Clustering

The following chapters provide information about the configuration of your SAP system with Microsoft Failover Clustering. It describes the components you have to install for an SAP system running in a Microsoft Failover Cluster, and how to distribute them on the specific host. For more information, see:

- SAP System Components in a Microsoft Failover Cluster [page 189]
- Enqueue Replication Server in a Microsoft Failover Cluster [page 194]

8.2.1.1 SAP System Components in a Microsoft Failover Cluster

In a Microsoft Failover Cluster configuration, you have the following mandatory components for your SAP system:

<table>
<thead>
<tr>
<th>Component</th>
<th>Number of Components per SAP System</th>
<th>Single Point of Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCS instance (message services and enqueue services)</td>
<td>1</td>
<td>yes</td>
</tr>
<tr>
<td>Application server instance (primary application server, additional application server)</td>
<td>1-&lt;n&gt;</td>
<td>no</td>
</tr>
</tbody>
</table>

- To protect the SPOFs (ASCS instance and database instance), you have to use Microsoft Failover Clustering.
If a hardware or software problem occurs on the first cluster node, the clustered ASCS instance automatically fails over to another node.

If you need to maintain the cluster node where the ASCS instance is running, you can switch this instance to another node. When maintenance work is finished, you move the ASCS instance back to the original node.

- To protect system components that are non-SPOFs, for example application servers, you have to install them as multiple components. In this case, you must install at least two application servers (the primary application server instance and one additional application server instance) on two different hosts. You have the following options:
  - You install the primary application server and the additional application server instance on the cluster nodes of a Microsoft Failover Cluster. You install them on a local disk or external file share. Any additional application server instances are installed on hosts outside of the Microsoft failover cluster. If you have to maintain a cluster node, you have to stop the primary application server or the additional application server instance on that node. When you have finished maintenance, you restart the instances.

  **Note**

  If you install the primary application server and the additional application server instance on the cluster nodes, you must perform the hardware sizing for the failover cluster host, as in this case the application server is always running on this host. This increases system load and might impact performance.

  Note that, as usual in a failover cluster setup, the ASCS instance also switch to run on the failover cluster host in the event of failover, which temporarily also increases system load.

  - You install the primary application server and all additional application server instances on hosts, which are not part of a Microsoft Failover Cluster.

### SAP System Components in One Microsoft Failover Cluster

The following figures show examples for the installation of SPOFs and non-SPOFs of an SAP system in one Microsoft Failover Cluster with two nodes.

The first figure shows an Microsoft Failover Cluster configuration where the non-SPOFs components (primary application server instance, additional application server instance) are installed locally on the cluster nodes. Any additional application server instances are installed outside the Microsoft Failover Cluster on separate hosts.
Installation of SAP Systems Based on the Application Server ABAP of SAP NetWeaver 7.3
EHP1 to 7.52 on Windows: SAP HANA Database
High Availability with Microsoft Failover Clustering

The following figure shows an HA configuration, where the non-SPOFs components (primary application server instance, additional application server instance) are installed on separate hosts that are not part of the failover cluster.
Before SAP NetWeaver 7.0, SAP only supported the installation of one clustered SAP system in one Microsoft Failover Cluster with two cluster nodes. The reason was that the cluster share `sapmnt` resource could only be assigned to one cluster group and could only point to one shared drive.

The solution was to rename the cluster share `sapmnt` resource into `sapmnt<SPATSID>`, and use junctions, which pointed to the local disk. This is no longer required.

**Caution**

All local instances such as an enqueue replication server, primary or additional application server and the local part of the ASCS when you use a file share cluster are installed on the local disk where the `saploc` share is pointing to. Make sure that you have enough space on this local disk.

Every SAP system is placed in a separate cluster group with the unique name `SAP <SAPSID>`. Each SAP cluster group has its own IP address, network name, as well as the SAP service resource (or generic service resource), and the SAP instance resource. If you use the CSD option, the cluster group also contains a shared disk and a `sapmnt` share. In case of the FSC option, the group does not contain a shared drive and the `sapmnt` share is located on a file share.
If you have an HA configuration with three or more cluster nodes, the following restrictions apply:

- The ASCS instance must be configured to be able to perform a fail over between two cluster nodes in one Microsoft Failover Cluster. For more information, see SAP Note 1634991.
- If the database supports the installation on several cluster nodes, the database instance can be installed on more than two cluster nodes in one Microsoft Failover Cluster.

The following figure shows the installation of multiple SAP systems in one Microsoft Failover Cluster. For each SAP system you have to install one primary and at least one additional application server.

**8.2.1.3 Multiple SAP Systems In Multiple Microsoft Failover Clusters**

Besides installing multiple SAP systems in one Microsoft Failover Cluster, you can also install multiple SAP systems in several Microsoft Failover Clusters with two or more cluster nodes.

For this failover cluster configuration, the following restrictions apply:

- The ASCS instance must be configured to run on two cluster nodes in one Microsoft Failover Cluster. For more information, see SAP Note 1634991.
- If the database supports the installation on several cluster nodes, the database instance can be installed on more than two cluster nodes in one Microsoft Failover Cluster.
The following figure shows the installation of multiple SAP systems in two Microsoft Failover Clusters with three cluster nodes, called Node A, B, and C. In this example, the ASCS instances are installed in the first Microsoft Failover Cluster, and the database instances for the two SAP systems are installed on the second Microsoft Failover Cluster. The application servers can be either installed on a local disk on the cluster nodes or outside the Microsoft Failover Cluster on separate hosts.

**Note**

If you use an enqueue replication server, you must configure the enqueue replication server, and the ASCS instance on two nodes.

For more information, see SAP Note 1634991.

### 8.2.1.4 Enqueue Replication Server in a Microsoft Failover Cluster

The enqueue replication server contains a replica of the lock table (replication table) and is an essential component in a high-availability setup. It is installed on the two cluster nodes where the ASCS instance is installed and configured to run, even if you have more than two cluster nodes.

In normal operation the enqueue replication server is always active on the host where the ASCS instance is not running.
If an enqueue server in a Microsoft Failover Cluster with two nodes fails on the first cluster node, the enqueue server on the additional cluster node is started. It retrieves the data from the replication table on that node and writes it in its lock table. The enqueue replication server on the first cluster node then becomes inactive. If the first cluster node is available again, the enqueue replication server on the second cluster node becomes active again.

The following figure shows the enqueue replication server mechanism in an Microsoft failover cluster configuration with two nodes:

**Note**

"enqueue server" versus “enqueue server 2”, ”enqueue replication server” versus “enqueue replication server 2”: Software Provisioning Manager 1.0 installs the “enqueue server” and “enqueue replication server” by default for all SAP system releases in the ASCS instance. However, if you have installed an SAP system based on SAP NetWeaver AS for ABAP 7.52, you can switch to “enqueue server 2” and “enqueue replication server 2” after the installation has completed. For more information, see https://help.sap.com/nw752abap.

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**8.2.2 Distribution of SAP System Components to Disks for Failover Clustering**

When planning the Microsoft Failover Cluster installation, keep in mind that the cluster hardware uses different storage resources:

- **Local Resources**
  - Local disks that are connected directly to the cluster nodes
• Shared Storage Resources
  • Shared disks that can be accessed by all cluster nodes via a shared interconnect if CSD option is used

  **i Note**

  Shared disk is a synonym for the cluster *Resource type* Physical disk.

  • An external file share if the FSC option is used

You need to install the SAP system components in both the following ways:

• Separately on all cluster nodes to use the local storage on each node

• You have two options to distribute the shared files which are used by all cluster nodes:
  • You install the following on different shared disks:
    • ASCS instance
    • Single quorum device, if used
  • On an external file share that is made accessible to all cluster nodes:
    • All database files are installed on an external host, or an additional cluster in this scenario
    • If a quorum is used, it is configured as a file share quorum on the file share host

![Diagram showing the distribution of SAP system components for an SAP system in a failover cluster with an external file share (FSC).](image)

**Quorum Configurations on Windows**

On Windows, there are several quorum configurations available. The configuration to use mainly depends on the cluster setup, such as the number of cluster nodes, the storage type (single or distributed), the distribution to shared disk and file share, and the number of data centers. For more information, see the Windows documentation.

If the number of cluster nodes is odd, you need no quorum. For a cluster with an even number of nodes you can configure a disk quorum, a file share quorum, or a cloud quorum.

The default quorum configuration is called *Node and Disk Majority* for clusters with more than two nodes.
With a quorum configuration, each node and the witness maintain its own copy of the cluster configuration data. This ensures that the cluster configuration is kept running even if the active node fails or is offline.

⚠️ Caution

If you do not use the default quorum configuration for your operating system, contact your hardware partner, who can help you to analyze your needs and set up your cluster model. SAP supports these configurations if they are part of a cluster solution offered by your Original Equipment Manufacturer (OEM), or Independent Hardware Vendor (IHV).

**Geographically Dispersed Cluster (Geospan)**

The standard cluster configuration consists of two cluster nodes and a shared storage with all technical components located in the same data center. In a geographically dispersed cluster, also known as a geospan cluster, the cluster nodes are distributed across at least two data centers to avoid the full outage of a data center in the event of disaster.

A geospan configuration requires a more sophisticated storage architecture since a standard shared storage can only be located in one data center and might therefore be a single point of failure (SPOF). To prevent the disk storage becoming a SPOF, you have to configure the storage system in each data center and to replicate its content to the storage system of the other data center.

Replication can either be synchronous or asynchronous, depending on the:

- Functionality of the storage subsystem
- Acceptable amount of data loss during a failover
- Physical layout of the storage area network
  This includes the distance between the storage systems, signal latency, capacity, and speed of the network connection.
- Customer budget

### 8.2.3 Directories in a Microsoft Failover Cluster Configuration

The following tables show the directories where the main software components for a high-availability system are stored:

**Directories on Local Disks on Cluster Nodes**

<table>
<thead>
<tr>
<th>Component</th>
<th>Default Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td>A supported operating system [page 43]</td>
<td>%windir%</td>
</tr>
<tr>
<td>Microsoft Failover Clustering software</td>
<td>%windir%\Cluster</td>
</tr>
<tr>
<td>Component</td>
<td>Default Directory</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Only if FSC option is used: ASCS instance</td>
<td>&lt;Local_Drive&gt;:\usr\sap&lt;SAPSID&gt;\ASCS&lt;Instance_Number&gt;</td>
</tr>
<tr>
<td>Application server</td>
<td>&lt;Local_Drive&gt;:\usr\sap&lt;SAPSID&gt;&lt;Instance&gt;</td>
</tr>
<tr>
<td>Enqueue replication server</td>
<td>&lt;Local_Drive&gt;:\usr\sap&lt;SAPSID&gt;\ERS&lt;Instance_Number&gt;</td>
</tr>
<tr>
<td>Diagnostics Agent (optional)</td>
<td>&lt;Local_Drive&gt;:\usr\sap&lt;DASID&gt;\SMDA&lt;Instance_Number&gt;</td>
</tr>
<tr>
<td>SAP Host Agent</td>
<td>%Program Files%\SAP\hostctrl</td>
</tr>
</tbody>
</table>

**Directories on Shared Disks**

<table>
<thead>
<tr>
<th>Component</th>
<th>Default Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster quorum resource (if used)</td>
<td>&lt;Drive&gt;:\Cluster</td>
</tr>
<tr>
<td>SAP global and instance directories</td>
<td>&lt;Drive&gt;:\usr\sap ...</td>
</tr>
</tbody>
</table>

During the installation of an SAP system distributed over several hosts, you can now specify that the SAP Global directories are installed on a host different from the ASCS instance host. For more information, see SAP Note 3349121.

### 8.2.4 Hostnames in a Failover Cluster Configuration

A part of the installation process that is unique to Microsoft Failover Clustering is the configuration of host names and IP addresses in the network. This is a particularly important task because the addressing plays a key role in the switchover procedure. Addressing must be set up correctly so that the system can take advantage of the cluster functionality and switch between nodes when hardware problems arise.

This section explains the different types of IP addresses and their function in the switchover mechanism of one Microsoft Failover Cluster with two cluster nodes.

#### Types of IP Addresses

In a proper configured cluster with at least two nodes, there are at least seven IP addresses and corresponding host names for your SAP system. You have two IP addresses for each cluster node, one IP address for the cluster, one address for the SAP cluster group and one for the database cluster group.

Some of the addresses are assigned to the network adapters (network interface card, NIC) whereas others are virtual IP addresses that are assigned to the cluster groups.
Physical IP Addresses Assigned to Network Adapters

A Microsoft Failover Cluster configuration has at least two networks:

- A public network that is used for the communication between the primary application server, additional application servers, and the LAN.
- A private network that is used internally for communication between the nodes of the cluster, also called heartbeat.

The following figure shows a Microsoft Failover Cluster with two nodes and illustrates the adapters required for the public and private networks, and their corresponding physical IP addresses. A physical IP address, in contrast to a virtual one, is stationary and permanently mapped to the same adapter.

Host Names Assigned to Network Adapters

Each of the physical IP addresses of the network adapters must have a corresponding host name. For example, on the left-hand node in the figure above, you might assign the IP addresses of the public and private network adapters as follows:

<table>
<thead>
<tr>
<th>Network Adapter</th>
<th>IP Address</th>
<th>Host Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapter 1 (private network)</td>
<td>10.1.1.1</td>
<td>clusA_priv</td>
</tr>
<tr>
<td>Adapter 3 (heartbeat network)</td>
<td>192.168.1.1</td>
<td>clusA</td>
</tr>
</tbody>
</table>

⚠️ Caution

- The IP address and host name of the public network adapter is also the IP address and name of the machine. In our example, this means that the machine that is the cluster node on the left in the figure has the name clusA.
- Do not confuse the host name with the computer name. Each node also has a computer name, which is usually the same as the host name. The computer name is displayed in the node column of the Failover Cluster Management. However, it is not required for the TCP/IP communication in the cluster. When you configure IP addresses and
corresponding names, keep in mind that it is the **host names** that are important for the cluster, not the computer names.

### Virtual IP Addresses Assigned to Cluster Groups

After you have installed the SAP system and fully configured the cluster, the critical system resources are bound together in two different **groups**.

Each of these groups requires a virtual IP address and network name that is permanently mapped to the group and not to a particular node. The advantage of this is that, whenever a group is moved between nodes, its IP address and network name move together with the group.

An HA configuration has the following groups:

- SAP cluster group for each clustered SAP system
- Cluster group

The following figure illustrates how the virtual IP addresses of the SAP group can move from one node to the other during a failover.

![Failover of Virtual IP Addresses](image)

**8.2.5 Obtaining IP Addresses for a Microsoft Failover Cluster Configuration**

This chapter describes how to obtain the IP addresses for the network adapters (cards) that are required to install and run your high-availability system.

**Context**

For a clustered system, you have to configure IP addresses correctly. During the installation procedure you have to assign at least seven IP addresses and host names. You normally obtain these names and addresses from the system administrator.
Procedure

Ask the system administrator to give you the addresses and host names listed in the tables below, which show an example for a configuration with one Microsoft failover cluster with two nodes. You need to enter the addresses and host names later during the installation process.

The column *Defined During* indicates at which stage of the installation of the operating system and the SAP system the addresses are defined in the system.

⚠️ Caution

Use the names *exactly* as specified by the system administrator.

ℹ️ Note

In the following tables we are still using the terminology cluster group, and not the Windows Server terminology Roles.

### Physical IP Addresses

<table>
<thead>
<tr>
<th>Component</th>
<th>Example for Physical IP Address</th>
<th>Example for Physical Host Name</th>
<th>Purpose</th>
<th>Defined During</th>
</tr>
</thead>
<tbody>
<tr>
<td>First cluster node: adapter for heartbeat network</td>
<td>10.1.1</td>
<td>clusA_priv</td>
<td>Address for internode communication on the heartbeat network</td>
<td>Windows installation</td>
</tr>
<tr>
<td>First cluster node: adapter for public network</td>
<td>129.20.5.1</td>
<td>clusA</td>
<td>Address of the first cluster node for communication with application servers and LAN (this is the same as the address of the first cluster node)</td>
<td>Windows installation</td>
</tr>
<tr>
<td>Additional cluster node: adapter for heartbeat network</td>
<td>10.1.1.2</td>
<td>clusB_priv</td>
<td>Address for internode communication on the heartbeat network</td>
<td>Windows installation</td>
</tr>
<tr>
<td>Additional cluster node: adapter for public network</td>
<td>129.20.5.2</td>
<td>clusB</td>
<td>Address of the additional cluster node for communication with application servers and LAN (this is the same as the address of the additional cluster node)</td>
<td>Windows installation</td>
</tr>
</tbody>
</table>
### Virtual IP Addresses

<table>
<thead>
<tr>
<th>Component</th>
<th>Example for Virtual IP Address</th>
<th>Example for Host Name</th>
<th>Purpose</th>
<th>Defined During</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster group</td>
<td>129.20.5.3</td>
<td>clusgrp</td>
<td>Virtual address and name of the cluster group. It identifies the cluster and is used for administration purposes.</td>
<td>Failover cluster software configuration</td>
</tr>
<tr>
<td>Database cluster group</td>
<td>129.20.5.4</td>
<td>dbgrp</td>
<td>Virtual address and name for accessing the group of database resources, regardless of the node it is running on</td>
<td>Execution of HA-wizard or database-specific cluster scripts</td>
</tr>
<tr>
<td>SAP cluster group</td>
<td>129.20.5.5</td>
<td>sapgrp</td>
<td>Virtual address and name for accessing the group of SAP resources, regardless of the node it is running on</td>
<td>Configuration of SAP system for high availability with the software provisioning manager on the first node</td>
</tr>
</tbody>
</table>

### 8.3 Preparation

This section provides information about how to prepare the installation of the SAP system for Microsoft Failover Clustering. For a complete list of all steps, see section Preparation in the Installation Checklist for a High-Availability System [page 187].

1. You check that you have completed the same preparations [page 68] as for a non-HA system.
2. To make sure that all preparation steps have been correctly performed, check that the storage resources are available to all cluster nodes. If you want to run the CSD option, check if you can move the disk resources from one cluster node to another so that they are accessible from a single node at any time. If you want to run the FSC option, check if the external file share is accessible by your installation user from all cluster nodes.

### 8.4 Installation

The following sections provide information about how to install the SAP system in a high-availability environment. For a complete list of all steps, see section Installation in the Installation Checklist for a High-Availability System [page 187].
You have the following options to install the database instance:

- **CSD (Cluster Shared Disk)**
  - You use a high available database outside the cluster used for the ASCS instance. This scenario requires a shared disk for the ASCS instance and requires an additional cluster used for the database which may also require shared disks.
  - You install the database on a shared disk in the same cluster used for the ASCS instance.

- **FSC (File Share Cluster)**
  - You use a high available database outside the cluster used for the ASCS instance. This scenario does not require shared disks for the ASCS instance and requires an additional cluster used for the database which may require shared disks.

**Note**
The user starting the software provisioning manager must have full access rights on the file share `\<sapglobalhost>\sapmnt`.

### 8.4.1 Configuring the First Cluster Node

At the beginning of the installation with software provisioning manager, you will be asked to choose between FSC and CSD installation option. For more information, see Installation [page 202].

When you run the **First Cluster Node** option, the software provisioning manager:

- Creates the `saploc` share, pointing to a local disk
- Creates the `sapmnt` share, pointing to a local disk if the CSD option is used, or to the external file share if the FSC option is used
- Installs the ABAP central services instance (ASCS) and prepares this host as the SAP global host

**Note**
**ASCS instance with “Standalone Enqueue Server” versus ASCS instance with new “Standalone Enqueue Server 2”:** Software Provisioning Manager 1.0 installs the “Standalone Enqueue Server” by default for all SAP system releases in the ASCS instance. However, if you have installed the ASCS instance for an SAP system based on SAP NetWeaver AS for ABAP 7.52, you can switch to the new “Standalone Enqueue Server 2” after the installation has completed. For more information, see https://help.sap.com/nw752abap

- Creates the SAP cluster group and adds the ASCS instance to the SAP cluster group
- Installs the enqueue replication server instance (ERS instance) for the ASCS instance

**Note**
**ERS instance with “Enqueue Replication Server” versus ERS instance with new “Enqueue Replicator 2”:** Software Provisioning Manager 1.0 installs the ERS instance with the classic “Enqueue Replicator 2”.

- Installs the enqueue replication server instance (ERS instance) for the ASCS instance
Replication Server” by default for all SAP system releases. However, if you have installed the ERS instance for an SAP system based on SAP NetWeaver AS for ABAP 7.52, you can switch to “Enqueue Replicator 2” after the installation has completed. For more information, see https://help.sap.com/nw752abap Application Help SAP NetWeaver Library: Function-Oriented View SAP NetWeaver Application Server for ABAP Components of SAP NetWeaver Application Server for ABAP Standalone Enqueue Server 2 and Systems Based on SAP NetWeaver AS for ABAP 7.52 only: Switching to Standalone Enqueue Server 2 and Enqueue Replicator 2 [page 144].

- Installs the SAP Host Agent

⚠️ Caution

When you reboot during the conversion to Failover Clustering, resources fail over to the other cluster node. Therefore, after each reboot you have to return the system to the state it was in before the reboot.

Prerequisites

- You are logged on to the first cluster node as domain administrator or as a domain user who has the required administration rights. For a list of the required permissions, see Performing a Domain Installation without being a Domain Administrator [page 169].
- CSD: You must install the ASCS instance on a shared disk, and the ERS instance and SAP Host Agent on a local disk.
- FSC: You must install the ASCS instance on a local disk, like ERS instance and SAP Host Agent.

⚠️ Note

If you are installing SAP NetWeaver 7.5 Process Integration (PI) system, it is mandatory to use different shared disks for the ASCS and the SCS instance if you’re using a shared disk cluster. In case you use a File Share Cluster, you have to use different sapmnt shares for both instances.

- If you select the FSC option at the beginning of the installation, the global parts of a SAP system are stored on an external file share. The ASCS instance, the ERS instance, and SAP Host Agent are installed on a local disk.

Procedure

1. Run the software provisioning manager [page 101] and on the Welcome screen, choose <Product> <Database> SAP Systems <System> High-Availability System First Cluster Node.

⚠️ Note

If the software provisioning manager prompts you to log off from your system, log off and log on again.

2. Enter the required parameter values.
8.4.2 Installing the Database Instance

This procedure describes how to install the database instance.

Prerequisites

- The SAP cluster group is Online on the first cluster node.

Procedure

Perform the following steps on the first cluster node.

1. Run the software provisioning manager [page 101] and on the Welcome screen, choose <Product> <Database> SAP Systems <System> High-Availability System Database Instance.

2. Follow the instructions in the software provisioning manager dialogs and enter the required parameter values.

For more information about the input parameters, position the cursor on a parameter and press the F1 key in the software provisioning manager.
8.4.3 Configuring the Additional Cluster Node

Prerequisites

• You have already performed the First Cluster Node [page 203] option.

Context

When you run the Additional Cluster Node option it:

• Configures the additional cluster node to run the SAP cluster group
• Creates the saploc share, pointing to a local disk
• If you chose the FSC option:
  Installs the ASCS instance
• Installs the enqueue replication server instance (ERS) for the ASCS instance
• Installs the SAP Host Agent

⚠️ Caution

You must install the instances and SAP Host Agent on a local disk.

Procedure


   i Note
   If the software provisioning manager prompts you to log off from your system, log off and log on again.

2. Enter the required parameter values.

   i Note
   For more information about the input parameters, position the cursor on the parameter and press F1 in the software provisioning manager.

   ⚠️ Caution
   Do not accept default values, as they may come from SAP systems that already exist on the cluster.
8.4.4 Installing the Primary Application Server Instance

Use

You have the following options to install the primary application server instance:

- You install the primary application server instance on a cluster node.
- You install the primary application server instance on a host outside of Microsoft Failover Cluster.

Procedure

1. Run the software provisioning manager [page 101] and on the Welcome screen, choose:
   - <Product> <Database> SAP Systems <System> High-Availability System Primary Application Server Instance.
2. If the software provisioning manager prompts you to log off, choose OK and log on again.
3. Follow the instructions in the software provisioning manager dialogs and enter the required parameter values.

Note

- For more information about the input parameters, position the cursor on a parameter and press F1 in the software provisioning manager.
- If you install the primary application server instance on an cluster node, make sure that on the screen General SAP System Parameters for the:
  - Profile Directory, you use the UNC path (not the local path) of the SAPGLOBALHOST host name, for example: \<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile.
  - If CSD option is used, the virtual host name of the ASCS instance is the same as the SAPGLOBALHOST host name.
  - If FSC option is used the virtual host name of the ASCS instance is different from the SAPGLOBALHOST host name.

Installation Drive, you choose the local disk where you want to install the primary application server instance.

- If you are installing a SAP NetWeaver 7.5 Process Integration (PI) system, make sure that the virtual host names for the ASCS instance and the SCS instance are different.
4. Check that the primary application server instance is running.

8.4.5 Installing the Additional Application Server Instance

You have to install at least one additional application server instance for Microsoft Failover Clustering. You have the following options, to install the additional application server instance:

- You install the additional application server instance on a cluster node.
- You install the additional application server instance on a host outside of the failover cluster.

Procedure


2. If the software provisioning manager prompts you to log off, choose OK and log on again.

3. Follow the instructions in the software provisioning manager dialogs and enter the required parameter values.

   i Note

   - For more information about the input parameters, position the cursor on a parameter and press F1 in the software provisioning manager.
   - If you install the additional application server instance on an cluster node, make sure that on the screen General SAP System Parameters for the:
     - Profile Directory, you use the UNC path (not the local path) of the SAPGLOBALHOST host name, for example: \\<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile.
     - If CSD option is used, the virtual host name of the ASCS instance is the same as the SAPGLOBALHOST host name.
     - If FSC option is used, the virtual host name of the ASCS instance is different from the SAPGLOBALHOST host name.
     - Installation Drive, you choose the local disk where you want to install the additional application server instance.
     - Additional application server instance, you enter the same instance number as for the primary application server.

4. When you have finished, change the instance profile of the additional application server instance so that the number of its work processes equals the number of work processes of the primary application server instance.

5. If required, install more additional application server instances outside of the failover cluster.
i Note

Make sure that on the screen General SAP System Parameters for the Profile Directory, you use the UNC path of the virtual ASCS host name, for example:

\\<SAPGLOBALHOST>\sapmnt\<SAPSID>\SYS\profile.

In a HA-system, the virtual host name of the ASCS instance is the same as the SAP global host name.

8.5 Post-Installation

To complete and check the installation of the SAP system for a high-availability configuration, you need to perform the following steps:

1. You install the permanent SAP licenses on all cluster nodes.
2. After a new installation of a clustered ASCS instance, make sure that you update the saprc.dll (part of the NTCLUST.SAR) package in c:\windows\system32 as soon as possible. For more information, see SAP Note 1596496.
3. For information about Rolling Kernel Switch on Windows Failover Clusters, see SAP Note 2199317.
4. You perform the post-installation checks for the enqueue replication server. For more information, see the SAP Library at:

<table>
<thead>
<tr>
<th>SAP Release and SAP Library Quick Link</th>
<th>SAP Library Path (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP NetWeaver 7.3</td>
<td>Application Help Function-Oriented View Application Server Application Server Infrastructure Standalone Enqueue Server Installing the Standalone Enqueue Server Replication Server: Check Installation</td>
</tr>
<tr>
<td>SAP NetWeaver 7.3 including Enhancement Package 1</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver 7.4</td>
<td>Application Help Function-Oriented View Application Server Application Server Infrastructure Components of SAP NetWeaver Application Server Standalone Enqueue Server Installing the Standalone Enqueue Server Replication Server: Check Installation</td>
</tr>
<tr>
<td>SAP NetWeaver 7.5</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver Application Server for ABAP 7.51 innovation package</td>
<td></td>
</tr>
<tr>
<td>SAP NetWeaver AS for ABAP 7.52</td>
<td></td>
</tr>
</tbody>
</table>

5. If required, you perform the general post-installation steps [page 122] listed in this guide.
8.6 Additional Information

The following sections provide additional information about:

- Moving Cluster Groups, or Services and Applications, or Roles [page 210]
- Starting and Stopping the SAP System in a Microsoft Failover Cluster Configuration [page 211].

8.6.1 Moving Cluster Groups, or Services and Applications, or Roles

Use

When you reboot during the conversion to Microsoft Failover Clustering, cluster resources fail over to the other cluster node. Therefore, you have to return the system to the state it was in before the reboot, and move the resources back to the original node.

To move the database, or ASCS from one cluster node to the other, you use the following:

To move the database, or ASCS from one cluster node to the other, you use either the Failover Cluster Manager tool or PowerShell.

i Note

Microsoft changed the term “cluster groups” in the Failover Cluster Manager tool to Roles. If you use PowerShell, the term “cluster group” is still used for all cluster operations.

Procedure

Moving Roles, or Services and Applications, or Groups

To move the roles or services and applications, proceed as follows:

1. To move a role, open PowerShell in elevated mode, and enter the following command:
   ```powershell
   move-clustergroup "<role name>"
   ```
2. Repeat these steps for each role that you want to move.

Moving Roles or Cluster Groups

To move the roles proceed as follows:

1. To move a role, open PowerShell in elevated mode, and enter the following command:
   ```powershell
   move-clustergroup -name "<role name>"
   ```
2. Repeat these steps for each role that you want to move. If you have more than 2 nodes in your cluster, you can specify the specific cluster node for the move:
   ```powershell
   move-clustergroup -name "<role name>" -Node "<cluster node name>" -Wait 0
   ```
8.6.2 Starting and Stopping the SAP System in a Microsoft Failover Cluster Configuration

An SAP System in an HA configuration is typically configured into two HA groups: one cluster resource group contains the database resources, the other group contains the SAP ASCS instance.

**Note**

When starting a whole SAP system, you first need to start the database instance and then the remaining SAP instances.

When stopping a whole SAP system, you first need first to stop all SAP instances and then the database instance.

With the SAP MMC, or SAPControl you can start and stop all SAP instances whether they are clustered or not, except the database instance.

With certain HA administration tools (Cluster Administrator, Failover Cluster Manager, or PowerShell), you can only start or stop clustered SAP instances, such as the ASCS instance, or the database instance.

**Procedure**

**Starting and Stopping a Complete System or a Single Instance with SAP MMC or SAPControl**

With the SAP MMC, or the command line tool SAPControl, you can start or stop the complete SAP system or a single clustered or non-clustered SAP instance, except the database instance.

To start or stop the database instance, you have to use the tools described in “Starting and Stopping the clustered ASCS and Database Instance”.

For more information about SAP MMC or SAPControl, see Starting and Stopping the SAP System [page 174].

**Note**

- To use SAP MMC or SAPControl for starting or stopping a clustered SAP instance, the "SAP <SAPSID> <Instance_Number> Service" resource of the clustered instance must be online. Therefore, SAP recommends keeping the "SAP <SAPSID> <Instance_Number> Service" cluster resource always online, and using the SAP MMC or SAPControl to start or stop a clustered instance.

- You can also start SAPControl in the PowerShell.

**Starting and Stopping the clustered ASCS and Database Instance**

With certain HA administration tools, such as PowerShell, or Failover Cluster Manager, you can only start or stop clustered SAP instances, such as the ASCS instance or the database instance. For all other non-clustered instances, such as additional application server instances or the primary application server instance, you must use the SAP MMC or SAPControl.

- Using PowerShell
To start or stop the clustered ASCS instance or the database instance with PowerShell do the following:

1. To start the clustered database instance, open PowerShell in elevated mode, and enter the following command:

   ```
   start-clusterresource <database resource>
   ```

2. To start the clustered ASCS instance, open PowerShell in elevated mode, and enter the following command:

   ```
   start-clusterresource "SAP <SAPSID> <Instance_Number> Instance"
   ```

3. To stop the clustered ASCS instance, open PowerShell in elevated mode, and enter the following command:

   ```
   stop-clusterresource "SAP <SAPSID> <Instance_Number> Instance"
   ```

4. To stop the clustered database instance, open PowerShell in elevated mode, and enter the following command:

   ```
   stop-clusterresource <database resource>
   ```

   • Using the **Failover Cluster Manager**

     For all other non-clustered instances, such as additional application server instances or the primary application server instance, you must use the **SAP MMC** or **SAPControl**.

     1. Start the **Failover Cluster Manager** by choosing Start ➤ Administrative Tools ➤ Failover Cluster Manager.

     2. To start the ASCS instance, select the relevant service and application **SAP <SAPSID>**. In the right-hand pane, under Other Resources, right-click the resource **SAP <SAPSID> <Instance_Number> Instance**, and choose Bring this resource online.

     3. To stop the ASCS instance, select the relevant service and application **SAP <SAPSID>**. In the right-hand pane, under Other Resources, right-click the resource **SAP <SAPSID> <Instance_Number> Instance**, and choose Take this resource offline.
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