Installation Guide **CUSTOMER**

Software Provisioning Manager 1.0
Document Version: 2.3 – 2017-02-08

Installation of SAP Web Dispatcher for SAP Systems Based on SAP NetWeaver 7.0 to 7.5 on Windows

Content

1 Introduction. 5
1.1 About this Document. 5
1.2 About Software Provisioning Manager. 5
1.3 New Features. 6
1.4 Architecture and Functions of the SAP Web Dispatcher. 7
1.5 SAP Notes for the Installation. 11
1.6 Accessing the SAP Library. 11
1.7 Naming Conventions. 12

2 Planning. 13
2.1 Hardware and Software Requirements. 13
Hardware and Software Requirements Tables. 13
2.2 Basic Installation Parameters. 18

3 Preparation. 22
3.1 Checking the Windows File System. 22
3.2 Reducing the Size of the File Cache. 22
3.3 Required User Authorization for Running the Installer. 23
3.4 Performing a Domain Installation Without Being a Domain Administrator. 24
3.5 SAP Directories. 27
3.6 Using Virtual Host Names. 29
3.7 Preparing the Installation Media. 30
Downloading the Software Provisioning Manager Archive. 31
Using the Physical Media from the Installation Package. 32
Downloading Specific Installation Archives (Archive-Based Installation). 33
Downloading the Complete Installation Media. 34

4 Installation. 36
4.1 Prerequisites for Running the Installer. 36
4.2 Running the Installer. 36
4.3 Additional Information About the Installer. 38
Useful Information About the Installer. 38
How to Avoid Automatic Logoff by the Installer. 39
Interrupted Processing of the Installer. 40
Performing a Remote Installation. 42
Starting the Installer GUI Separately. 44
Running the Installer in Accessibility Mode. 46
Troubleshooting with the Installer. 47

5 Post-Installation Activities. 48
5.1 Logging on to the SAP Web Dispatcher Management Console. 48
5.2 SAP Web Dispatcher Configuration 49

6 Additional Information. 50
6.1 Using Virtual Host Names. 50
6.2 Checking and Changing the Paging File Settings on Windows Server 2012 (R2). 50
6.3 Starting and Stopping with the SAP Microsoft Management Console (SAP MMC). 52
6.4 Uninstall. 53

Document History

> **Note**
>
> Before you start the implementation, make sure you have the latest version of this document, which is available at https://support.sap.com/sltoolset ▶ ▶ *System Provisioning* ▶.

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

Table 1:

Version	Date	Description
2.3	2017-02-06	Updated version for software provisioning manager 1.0 SP19 (SL Toolset 1.0 SP19)
2.2	2016-10-07	
2.1	2016-06-06	Updated version for software provisioning manager 1.0 SP17 (SL Toolset 1.0 SP17)Updated version for software provisioning manager 1.0 SP18 (SL Toolset 1.0 SP18)
2.0	2016-02-15	Updated version for software provisioning manager 1.0 SP10 (SL Toolset 1.0 SP16): Archive-Based Installation (see Preparing the Installation Media [page 30])
1.9	2015-10-12	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP15)
1.8	2015-09-14	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP14)
1.7	2015-04-27	Updated version for software provisioning manager 1.0 SP08 (SL Toolset 1.0 SP13)
1.6	2014-11-24	Updated version for software provisioning manager 1.0 SP07 (SL Toolset 1.0 SP12)
1.5	2014-07-07	Updated version for software provisioning manager 1.0 SP18 (SLUpdated version for software provisioning manager 1.0 SP06 (SL Toolset 1.0 SP11)
1.4	2014-03-17	Updated version for software provisioning manager 1.0 SP09 (SL Toolset 1.0 SP10)
1.3	2013-10-28	Updated version
1.2	2013-07-15	Updated version
1.1	2013-04-12	Updated version
1.0	2012-12-17	Initial version

1 Introduction

1.1 About this Document

This documentation describes how to install an SAP Web Dispatcher instance for SAP system products based on SAP NetWeaver 7.1 and higher using the installation tool software provisioning manager 1.0 SP19 (“installer” for short), which is part of SL Toolset 1.0 SP19.

You can find a complete list of supported SAP system products in SAP Note 1680045.

We recommend that you use a Web Dispatcher [page 7] when you run an SAP system with several application servers for web applications.

1.2 About Software Provisioning Manager

Software Provisioning Manager 1.0 is the successor of the product- and release-specific delivery of provisioning tools, such as SAPinst. Before you run it, we recommend that you always download the latest version of Software Provisioning Manager 1.0. Software Provisioning Manager 1.0 is part of the Software Logistics Toolset 1.0 (“SL Toolset” for short). This way, you automatically get the latest fixes and supported processes. For more information about Software Provisioning Manager as well as products and releases supported by it, see SAP Note 1680045 and http://scn.sap.com/docs/DOC-30236. “SAPinst” has therefore been renamed to “Software Provisioning Manager 1.0” in this documentation. However, the term “SAPinst” is still used in:

- Texts and screen elements in the Software Provisioning Manager GUI
- Naming of executables, for example `sapinst.exe`

In the following, we generally refer to Software Provisioning Manager 1.0 as the “installer”. We only use the term “Software Provisioning Manager 1.0” if this is required for technical reasons.

- ⚠ Caution

  SAP is going to restrict maintenance for operating system versions that have been initially released with SAP kernel 7.2<x> but are no longer supported for SAP kernel 7.40 and higher. The following Software Provisioning Manager operating system versions are affected:

  - WINDOWS SERVER ON IA32 32BIT
  - WINDOWS ON IA64
  - WINDOWS ON X86_64 64BIT: < 6.0 aka Windows 2008

  With the release of Software Provisioning Manager 1.0 SPS 18, the `SWPM*.SAR` archive will stop working on the above listed outdated operating system versions.

  Instead of using the `SWPM*.SAR` archive, you must use the `RMOSSWPM*.SAR` archive for these outdated operating system versions.

Keep in mind that the `RMOSSWPM*.SAR` archive will not receive improvements in the future. SAP maintenance for `RMOSSWPM*.SAR` will be finally stopped by the end of 2017.

SAP recommends upgrading the operating system to a more recent version and using `RMOSSWPM*.SAR` to export from existing SAP systems.

Related Information

Preparing the Installation Media [page 30]

1.3 New Features

The table below provides an overview of the new features in Software Provisioning Manager.

Make sure that you also read the release notes for your SAP product at http://help.sap.com > `<Product Area>` > `<Product>` > `<Release>` > *What's New – Release Notes* .

Table 2:

Feature	Description	Availability
Verification of Integrity of Data Units in Software Provisioning Manager	The integrity of data units extracted from the Software Provisioning Manager archive is verified. For more information, see Downloading the Software Provisioning Manager Archive [page 31]. In addition, check SAP Note 1680045 whether additional information is available.	Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)
Installation without Message Server Port Configuration	Configuration of message server host and port during the installation is now optional. For more information, see Basic Installation Parameters [page 18].	Software Provisioning Manager 1.0 SP19 (SL Toolset 1.0 SP19)
`WEBDISPATCHER.SAR` Archive for Archive-Based Installation	You can now use a specific `WEBDISPATCHER.SAR` archive instead of the `SAPEXE.SAR` archive. For more information, see Downloading Specific Installation Archives (Archive-Based Installation) [page 33]	Software Provisioning Manager 1.0 SP18 (SL Toolset 1.0 SP18)
Archive-Based Installation	You can now download the required **installation archives** instead of the complete SAP kernel installation media. For more information, see Downloading Specific Installation Archives (Archive-Based Installation) [page 33].	Software Provisioning Manager 1.0 SP10 (SL Toolset 1.0 SP16)

Feature	Description	Availability
System Provisioning for SAP NetWeaver 7.5 and SAP NetWeaver 7.5-based Products	All system provisioning tasks (installation, system copy, system rename) are available for the new SAP NetWeaver 7.5 release. The Dual Stack option, which integrates an AS ABAP and AS Java in a single system (common System ID `<SAPSID>`, common startup framework, common database), is no longer supported in SAP systems based on SAP NetWeaver 7.5.	Software Provisioning Manager 1.0 SP09 (SL Toolset 1.0 SP15)
Feedback Evaluation Form	SAP SE's aim is to provide fast and efficient procedures. To evaluate the procedure you just carried out, we need information generated by the tool during process execution and your experience with the tool itself. A new evaluation form contains a simple questionnaire and XML data generated during the procedure. Port 4239 is used for displaying the feedback evaluation form. For more information, see the *Prerequisites* section in Running the Installer [page 36].	Software Provisioning Manager 1.0 SP07 (SL Toolset 1.0 SP12)
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.	Software Provisioning Manager 1.0 SP06 (SL Toolset 1.0 SP11)

1.4 Architecture and Functions of the SAP Web Dispatcher

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

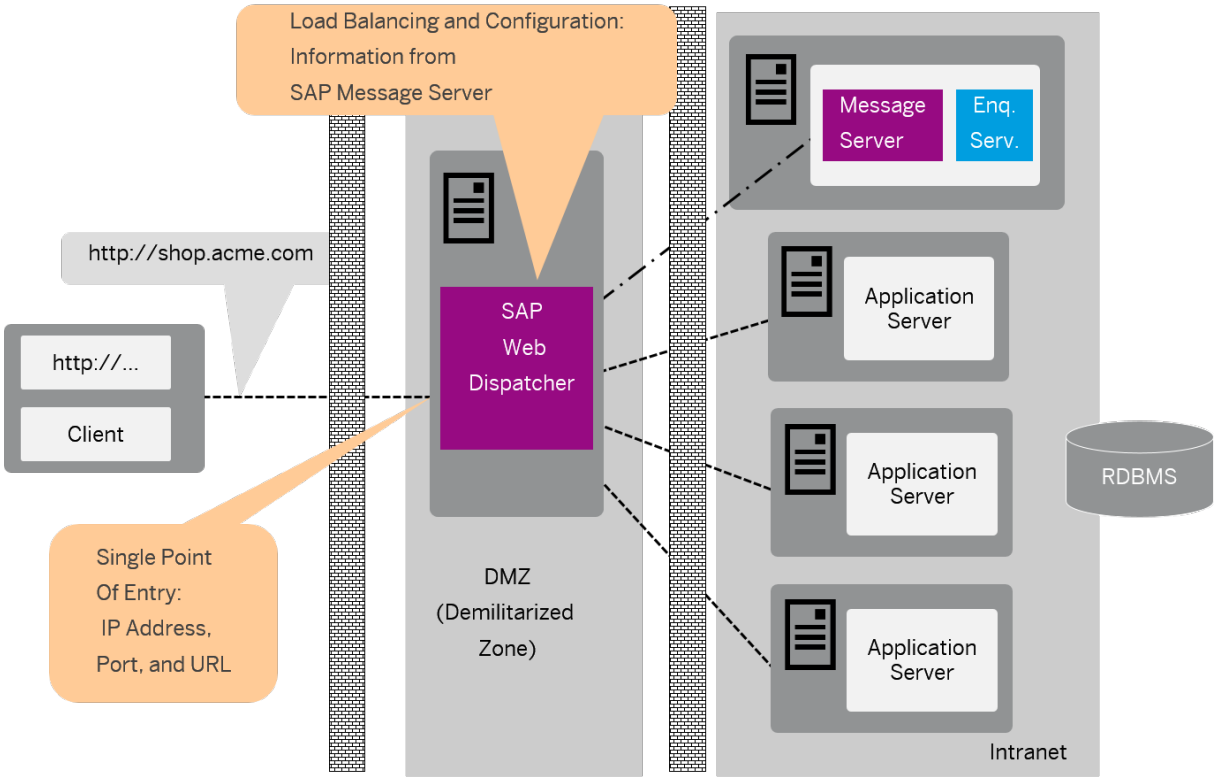

Figure 1: SAP Web Dispatcher in the System Landscape

It forwards the incoming requests (HTTP, HTTPS) in turn to the application server (AS) of the SAP system. The number of requests that are sent to an AS depends on its capacity. The capacity of an AS ABAP depends on the number of configured dialog work processes. The capacity of a AS Java depends on the number of server processes. If the application is stateful, the SAP Web Dispatcher ensures that with the next request, the user is forwarded to the server that is processing his or her application. To do this, it uses the session cookie with HTTP connections, and the client IP address with end-to-end SSL.

Furthermore, the SAP Web Dispatcher decides whether the incoming request should be forwarded to an ABAP or Java Server.

> **Note**
>
> Unlike HTTP load balancing with the SAP Message Server, redirects are not executed when the SAP Web Dispatcher is used. This avoids the associated disadvantages (several IP addresses must be known, book marking is not possible, authentication after changing the application server).

SAP Web Dispatcher for Multiple Systems

In the figure the SAP Web Dispatcher is located in front of an SAP system.

You can also place the SAP Web Dispatcher in front of multiple systems (SAP and/or external systems). In this case use parameter `wdisp/system_ <xx>` to inform the SAP Web Dispatcher of all the systems and their message servers.

Structure of the SAP Web Dispatcher

The architecture is the same as the architecture of the Internet Communication Manager (ICM). The SAP Web Dispatcher uses the same HTTP framework and is likewise structured modularly from subhandlers. But unlike the ICM, the SAP Web Dispatcher does not directly pass incoming requests to a work process (such as a server process)– it passes them to the ICM of the application server. The response of the application server to a request returns to the client using the same network connection via the SAP Web Dispatcher.

If the application server acting as the client opens connections to external HTTP servers, these connections go direct to the server (or possibly via a configured proxy) and not via the SAP Web Dispatcher.

The Web Dispatcher has the function of a “reverse proxy”, and not that of a “proxy”.

Processing HTTP Requests

Like the ICM the SAP Web Dispatcher uses various handlers to process incoming requests. With the exception of the ABAP handler and the Java handler the handlers are called in the precise sequence described in "Processing HTTP Requests". The **dispatching handler** comes last and this performs the load balancing and then forwards the request to the ICM of the appropriate application server.

Information Tables

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

> **Note**
>
> With Java-only installations of the SAP NetWeaver AS the message server of the “Central Services” (SCS) supplies the information. With ABAP installations the information comes from the message server of the AS ABAP. The SAP Web Dispatcher knows which message server is used from the parameters `rdisp/mshost` and `ms/http_port` or `wdisp/system_ <xx>`.

You can also use HTTPS here. The SAP Web Dispatcher keeps the information in the following tables:

Table 3:

Table	Information	Source of Information
Server table	All AS instances that process the HTTP(S) requests.	Message server of the SAP system with the server list.

Table	Information	Source of Information
Group table	Groups of HTTPS-enabled ABAP servers. Here there are known logon groups that are maintained in the system, as well as the following internal groups:	You maintain logon groups in transaction `SMLG` in AS ABAP. The SAP Web Dispatcher can get the information from any AS ABAP. Each application server belongs to at least two of the internal groups. Each server can also offer ABAP and Java and hence belong to all groups. You can also configure logon groups for AS Java.
!ALL	Group of all connected application servers.	
!J2EE	Group of those application servers that contain the AS Java.	
!DIAG	Group of ABAP servers that provide the dialog work processes.	
!J2EES	Group of HTTPS-enabled application servers that contain the AS Java.	
!DIAGS	Group of HTTP-enabled servers that provide the dialog work processes.	
URL mapping table	Mapping of the path part that is specified in the browser to the information about the server (groups). **Example** You can determine, for example, that all requests that contain the path prefix `/sap/bc`are only processed by the servers that process logon group `GROUP_1`.	You maintain the URL path in transaction `SICF` in AS ABAP as a service in the HTTP service tree. The SAP Web Dispatcher can get the information from any AS.

More Information

For more information, see the Web Dispatcher documentation in the SAP Library [page 11] at: *Function-Oriented View* > *Application Server Infrastructure* > *Components of SAP NetWeaver Application Server* > *SAP Web Dispatcher*

1.5 SAP Notes for the Installation

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

Make sure that you have the up-to-date version of each SAP Note which you can find in the SAP Service Marketplace at http://service.sap.com/notes.

Table 4: SAP Notes for the Installation

SAP Note Number	Title	Description
1680045	Release Note for Software Provisioning Manager 1.0	Remarks, annotations, and corrections discovered after publication of the documentation Software Provisioning Manager
908097	SAP Web Dispatcher: Release, Installation, Patches, Documentation	Contains information about the following: • How to apply patches to an existing Web Dispatcher installation • Which Web Dispatcher release you can use with which SAP NetWeaver release

1.6 Accessing the SAP Library

The references to **SAP NetWeaver Library** documentation in this installation guide always refer to the following on SAP Help Portal:

Table 5:

Product and Release	SAP Library Path
SAP systems based on SAP NetWeaver 7.3	http://help.sap.com/nw73 ▶ *Application Help* ▶ *Function-Oriented View: English* ▶
SAP systems based on SAP NetWeaver 7.3 including Enhancement Package 1	http://help.sap.com/nw731 ▶ *Application Help* ▶ *Function-Oriented View: English* ▶
SAP systems based on SAP NetWeaver 7.4	http://help.sap.com/nw74 ▶ *Application Help* ▶ *Function-Oriented View: English* ▶
SAP systems based on SAP NetWeaver 7.5	http://help.sap.com/nw75 ▶ *Application Help* ▶ *Function-Oriented View: English* ▶

1.7 Naming Conventions

In this documentation, the following naming conventions apply:

> **Note**
>
> From a technical point of view, the web dispatcher is set up like an SAP system with its own SAP system ID (SAPSID), its own operating system users, and its own directory structure.

- *installer* refers to *software provisioning manager 1.0*.
- *SAP system* refers to *web dispatcher* .
- *instance* refers to a *web dispatcher Instance*.

2 Planning

2.1 Hardware and Software Requirements

You check that your hosts meet the hardware and software requirements for your operating system and the Web Dispatcher.

> **Caution**
>
> If your hosts do not fully meet the requirements, you might experience problems when working with the SAP system.

Process Flow

1. Check the *Product Availability Matrix* at http://service.sap.com/pam for supported operating system releases.
2. If you want to use the Web Dispatcher for a **production** system, the values provided by the Prerequisite Checker and the hardware and software requirements checklists are not sufficient. In addition, do the following:
   - You use the hardware sizing information available at http://service.sap.com/sizing.
     For the Web Dispatcher, there is a sizing guideline available at:
     http://service.sap.com/sizing > *Sizing Guidelines* > *Solutions & Platform* > *Sizing the SAP Web Dispatcher*
   - 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

2.1.1 Hardware and Software Requirements Tables

The Web Dispatcher host must meet the following requirements:

Table 7: Hardware Requirements

Hardware Requirement	Requirement	How to Check
Minimum disk space	• 1 GB of hard disk space minimum for the installation as such. For production use, you need to reserve at least 5 GB. • Temporary disk space for every required installation medium that you have to copy to a local hard disk: 4.3 GB	To check disk space: • Windows Server 2012 (R2): 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. • Windows Server 2008 (R2): 1. Choose *Start* > *All Programs* > *Administrative Tools* > *Storage* > *Computer Management* > *Disk Management* >. 2. Right-click the drive and choose *Properties*.

Hardware Requirement	Requirement	How to Check
Minimum RAM	The SAP Web Dispatcher instance requires 1 GB RAM minimum. For memory consumption in productive use, see SAP Note 2007212.	To check RAM: • Windows Server 2012 (R2): Open PowerShell in elevated mode, and enter the following command: `Get-WmiObject Win32_ComputerSystem` • Windows Server 2008 (R2): Choose *Start* > *Control Panel* > *System* >. **Note** If *System* is not visible, change *View by:* from *Category* into *Large icons*.

Hardware Requirement	Requirement	How to Check
Paging file size	For more information, see SAP Note 1518419.	To check paging file size: • Windows Server 2012 (R2): For more information, see Checking and Changing the Paging File Settings on Windows Server 2012 (R2) [page 50] • Windows Server 2008 (R2): 1. Choose *Start* > *Control Panel* > *System*. **Note** If *System* is not visible, change *View by:* from *Category* into *Large icons*. 2. Choose *Advanced system settings*. 3. In section *Performance*, select *Settings...* > *Advanced*. 4. If required, in section *Virtual memory*, choose *Change*. **Note** Do **not** select *Automatically managed paging file size for all drives*.

Hardware Requirement	Requirement	How to Check
Processing units	The number of physical or virtual processing units usable by the operating system image must be equal to or greater than 2. 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.	
Suitable backup system		

Table 8: Software Requirements

Software Requirement	Requirement	How to Check

Windows operating system	• **64-bit version** of one of the following Windows Server Editions:
	  ○ Windows Server 2012 (R2):
	  ○ Windows Server Standard Edition
	  ○ Windows Server Datacenter Edition
	  ○
	  ○ Windows Server Standard Edition
	  ○ Windows Server Enterprise Edition
	  ○ Windows Server Datacenter Edition
	  ○ Windows Server 2008 (R2) for Itanium-Based Systems Edition
	
	⚠ 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.
	
	⚠ 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
		To check your Windows version:
		• Windows Server 2012 (R2):
		Open PowerShell in elevated mode, and enter the following command:
		`Get-WmiObject Win32_OperatingSystem | select caption`
		• Windows Server 2008 (R2):
		1. Choose *Start* > *All Programs* > *Accessories* > *Command Prompt*
		2. Enter the command **winver**

Software Requirement	Requirement	How to Check
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*.

2.2 Basic Installation Parameters

The table below lists the basic input parameters that are prompted by the installer. For all other SAP system parameters, use the F1 help in the installer screens.

Table 9:

Parameters	Description
SAP System ID `<SAPSID>`	The SAP System ID `<SAPSID>` identifies the whole SAP system. **Caution** Choose your SAP system ID carefully. You **cannot** change the SAP system ID after the installation. Make sure that your SAP system ID: • Is unique throughout your organization • Consists of exactly three alphanumeric characters • Contains only uppercase letters • Has a letter for the first character • Does not include any of the reserved IDs listed in SAP Note 1979280.
Instance Number for the SAP Web Dispatcher	**Instance Number:** Technical identifier for internal processes. 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. **Caution** Do not use 43, 60, 89 for the instance number of the SAP Web Dispatcher.

Parameters	Description
Virtual Host Name	Virtual host name (network name) of the `SAP<SAPSID>` cluster group If you provide a virtual host name in the `<Instance_Name>` *Virtual Host* field of the screen of an instance, this instance is installed with the given virtual host name. After the installation has completed, all application servers can use this virtual host name to connect to the instance. The virtual host name is also a global host name. If you do not provide the virtual host name, the instance is installed automatically using its physical host name. You must have already reserved the virtual host name (network name) and its IP address on a DNS server before you run the installer. For more information, see Using Virtual Host Names [page 29]. **Note** Fully qualified host names, `IPv4`, `IPv6` are not accepted as virtual host names. Alternatively you can assign virtual host names also by starting the installer with the `SAPINST_USE_HOSTNAME` property. For more information, see Running the Installer [page 36].

Parameters	Description

Operating System Users	The passwords of the operating system users **must** comply with the Windows password policy. The installer processes the passwords of operating system users as follows:
	• If the operating system users do **not** exist, SAP creates the following users:
	  ○ `<sapsid>adm`
	  This user is the SAP system administrator user. It is a member of the local `Administrators` group.
	  ○ `SAPService<SAPSID>`
	  This user is the Windows account to run the SAP system. It is not a member of the local `Administrators` group.
	  ○ `sapadm`
	  The host agent user `sapadm` is used for central monitoring services. The installer creates this user by default as a local user although it is not a member of the local `Administrators` group.
	  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 24]. For security reasons, however, SAP strongly recommends you to create this user as a local user.
	  The installer sets the master password for these users by default. You can overwrite and change the passwords either by using the parameter mode *Custom* or by changing them on the parameter summary screen.
	• If the operating system users already exist, the installer prompts you for the existing password, except the password of these users is the same as the master password.
	⚠ Caution
	Make sure that you have the required user authorization [page 23] for these accounts before you start the installation.

Message Server Host	You can configure the SAP Web Dispatcher to connect to an SAP system immediately during the installation by defining the host on which the message server is located (profile parameter `MSHOST`). However, you can also specify to not configure the message server host and configure it manually after the installation has completed.
Message Server HTTP(S) Port	You can configure the SAP Web Dispatcher to connect to an SAP system immediately during the installation by defining the HTTP(S) port of the message server (profile parameter `MSPORT_<XX>`). However, you can also specify to not configure the HTTP(S) port of the message server and configure it manually after the installation has completed.

Parameters	Description
SAP Web Dispatcher Configuration	• You can specify a maximum of incoming concurrent connections This value is directly mapped to the tuning parameter `icm/max_conn`. For more information, see SAP Note 2007212. • HTTPS port: The HTTPS port of the SAP Web Dispatcher is an entry point to the SAP system. The default is `443<XX>`(where `<XX>` is the instance number). • HTTP port: Optionally you can change the HTTP port number if the port number assigned by default does not suit your needs. The HTTP port of the SAP Web Dispatcher is an entry point to the SAP system. The default is `80<XX>` (where `<XX>` is the instance number). You can either accept a default value for the HTTP port number or configure the port number as required. ➔ Recommendation If you want to install SAP Web Dispatcher version 7.21, we recommend that you choose the HTTP port, because the HTTPS port is not available after the installation without further configuration. For more information about port configuration for SAP Web Dispatcher, see the SAP Library [page 11] at: *Application Server* > *Application Server Infrastructure* > *Components of SAP NetWeaver Application Server* > *SAP Web Dispatcher* > *Administration of the SAP Web Dispatcher* > *Configuration of the SAP Web Dispatcher Server Port*
Encryption Mode	The Encryption Mode defines the encryption for communication between the SAP Web Dispatcher and the back-end system. You can choose between one of the following options: • Always: HTTPS is used. • Never: HTTP is used. • IDepending on the incoming protocol: HTTPS is used for requests to the SAP Web Dispatcher HTTPS port, whereas HTTP is used for requests to the SAP Web Dispatcher HTTP port. The profile parameter responsible for the encryption mode is named `SSL_ENCRYPTION`.
Activate ICF nodes	The SAP Web Dispatcher uses ICF services of SAP ABAP system's application servers to retrieve information about server groups and URL mappings. By default, all ICF services are inactive. For more information, see SAP Note 552286.

3 Preparation

3.1 Checking the Windows File System

Use

You need to check that you are using the Windows file system NTFS on hosts where you want to install the SAP system and database. NTFS supports full Windows security and long file names.

> **Note**
>
> You must use NTFS for an SAP system installation. Do **not** install the SAP directories on a FAT partition.

Procedure

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.

3.2 Reducing the Size of the File Cache

Use

> **Note**
>
> This step is not required if you use Windows Server 2008.

The Windows file cache competes directly with SAP programs for memory. Therefore, you need to adjust the file cache as described below.

Procedure

1. Choose ▶ *Start* ▶ *Control Panel* ▶ *Network Connections* ▶ *Local Area Connections* ▶.
2. In the *Local Area Connection Status* dialog box, choose *Properties*.
3. In the *Local Area Connection Properties* dialog box, double-click *File and Printer Sharing for Microsoft Networks*.
4. Select *Maximize data throughput for network applications*.

   ⚠ Caution

   If you cannot select *File and Printer Sharing for Microsoft Networks*, this option has not yet been installed. To install it, you need the Windows Server CDs.

5. To confirm your entries, choose *OK*.

3.3 Required User Authorization for Running the Installer

Although the installer 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` 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` and the domain `Admins` group of the relevant domain. 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 you to perform a domain installation to avoid authorization problems.

For a domain installation, you need to:

1. Check that the account used for the installation is a member of the domain `Admins` group.

2. If required, obtain these rights by asking the system administrator to enter the account as a member of the domain `Admins` group.

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.

If the SAP system is to run on a **single** machine, you can perform a local installation.

> **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 installer. 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.

3.4 Performing a Domain Installation Without Being a Domain Administrator

You normally perform a domain installation of the SAP system with a user who is a member of the domain `Admins` group, as described in Required User Authorization for Running the Installer [page 23]. If for any reason, the account used for the installation is not a member of the domain `Admins` group, you can perform the installation with a domain user who is a member of the local `Administrators` group. In this case, the domain administrator has to prepare the system appropriately for you. The domain administrator can perform the following steps either using the installer or manually:

1. Create the new global group `SAP_<SAPSID>_GlobalAdmin`.
2. Create the two new SAP system users `<sapsid>adm` and `SAPService<SAPSID>`.
3. Add the users `<sapsid>adm` and `SAPService<SAPSID>` to the newly created group `SAP_<SAPSID>_GlobalAdmin`.

> **Note**
>
> The installer 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
>
> However, for security reasons we strongly recommend you to create this user as a local user.

Prerequisites

- You must be domain administrator to perform the required steps.
- Windows Server 2008 (R2) and Windows Server 2012 (R2):
  You must have installed the feature *Remote Server Administration Tools* as follows:
  - Windows Server 2012 (R2):
    Open PowerShell in elevated mode, and enter the following command:
    `add-windowsfeature RSAT-ADDS`
  - Windows Server 2008 (R2):
    1. Choose *Start* > *Administrative Tools* > *Server Manager*.
    2. In the *Server Manager* window, select *Features*.
    3. Select the feature *Remote Server Administration Tools* > *Role Administration Tools* > *Active Directory Domain Services Tools*.

Procedure

Creating the Required Users and Groups Using the Installer

On the host where the SAP system is to be installed, the domain administrator starts the installer as described in Running the Installer [page 36] and chooses *Generic Installation Options* > *<Database>* > *Preparations* > *Operating System Users and Groups* to have the group and users created automatically.

Creating the Required Users and Groups Manually

> **Note**
>
> To create the users and groups specific to the SAP Host Agent, you must follow the procedure below, and replace the users and groups with those for the SAP Host Agent.

Creating the New Global Group SAP_<SAPSID>_GlobalAdmin

Perform the following steps:

- Windows Server 2012 (R2):
  Open PowerShell in elevated mode, and enter the following command:
  `net group SAP_<SAPSID>_GlobalAdmin /add /domain`
- Windows Server 2008 (R2):
  1. Log on as domain administrator.
  2. Start the *Active Directory Users and Computers Console* by choosing:
     Start > *Control Panel* > *Administrative Tools* > *Active Directory Users and Computers*.
  3. Right-click *Users* in *Tree*, and choose *New* > *Group*.
  4. Enter the following:
     Group name: **`SAP_<SAPSID>_GlobalAdmin`**
  5. Select the following:
     1. *Group scope*: Global
     2. *Group type*: Security

6. Choose *OK*.

Creating the New SAP System Users <sapsid>adm and SAPService<SAPSID>

Perform the following steps:

- Windows Server 2012 (R2):
  1. Open PowerShell in elevated mode.
  2. Create the `<sapsid>adm` user with the following command:
     `net user <sapsid>adm <Password> /add /domain`
  3. Create the `SAPService<SAPSID>` user with the following command:
     `net user SAPService<SAPSID> <Password> /add /domain`
- Windows Server 2008 (R2):
  1. In *Active Directory Users and Computers Console*, right-click *Users* in *Tree* and choose:
     New > *User*
  2. Enter the following:

     Table 10:

Field	Input for <sapsid>adm	Input for SAPService<SAPSID>
First name:	None	None
Initials:	None	None
Last name:	None	None

  3. Choose *Next* and enter the following:
     Password: **`<Password>`**
     Confirm password: **`<Password>`**
  4. Select *Password never expires*.

     > **Note**
     >
     > Make sure that no other options are selected.

  5. Choose *Next* > *Finish*.

Adding the Manually Created Users to Groups

> **Note**
>
> To add the users specific to the SAP Host Agent to the relevant groups, you must follow the procedure below, and replace the users and groups with those for the SAP Host Agent.

Adding the <sapsid>adm User to the SAP_<SAPSID>_GlobalAdmin Group

- Windows Server 2012 (R2):
  Open PowerShell in elevated mode, and enter the following command:
  `net group SAP_<SAPSID>_GlobalAdmin <sapsid>adm /add /domain`
- Windows Server 2008 (R2):
  1. In the *Users* folder, double-click the newly created user account `<sapsid>adm` in the list on the right.

2. Choose *Member* > *Add* .
3. Select the new *SAP_<SAPSID>_GlobalAdmin* group and choose *Add* to add it to the list.

> **Note**
>
> By default, the user is also a member of the `Domain Users` group.

4. Choose *OK* twice.

Adding the SAPService<SAPSID> User to the SAP_<SAPSID>_GlobalAdmin Group

- Windows Server 2012 (R2):
  Open PowerShell in elevated mode, and enter the following command:
  `net group SAP_<SAPSID>_GlobalAdmin SAPService<SAPSID> /add /domain`
- Windows Server 2008 (R2):
  1. In the *Users* folder, double-click the newly created user account *SAPService<SAPSID>* in the list on the right.
  2. Choose *Member* > *Add* .
  3. Select the new *SAP_<SAPSID>_GlobalAdmin* group.
  4. Choose *Add* to add it to the list, and then *OK*.
  5. Choose *OK* to close *SAPService<SAPSID>Properties*.
  6. Close the *Active Directory Users and Computers Management Console*.

3.5 SAP Directories

The installer automatically creates the directories listed in the following figures and tables. Before running the installation, you have to set up the required file systems manually. In addition, you have to make sure that the required disk space for the directories to be installed is available on the relevant hard disks. The figure below assumes that you have set up one file system for the SAP system mount directory `<sapmnt>` and one file system for the `/usr/sap` directory. However, you have to decide for which directories you want to set up separate file systems. If you do not set up any file system on your installation host, the installer creates all directories in the `root` directory `/`. The installer prompts you only for the `<sapmnt>` directory during the installation.

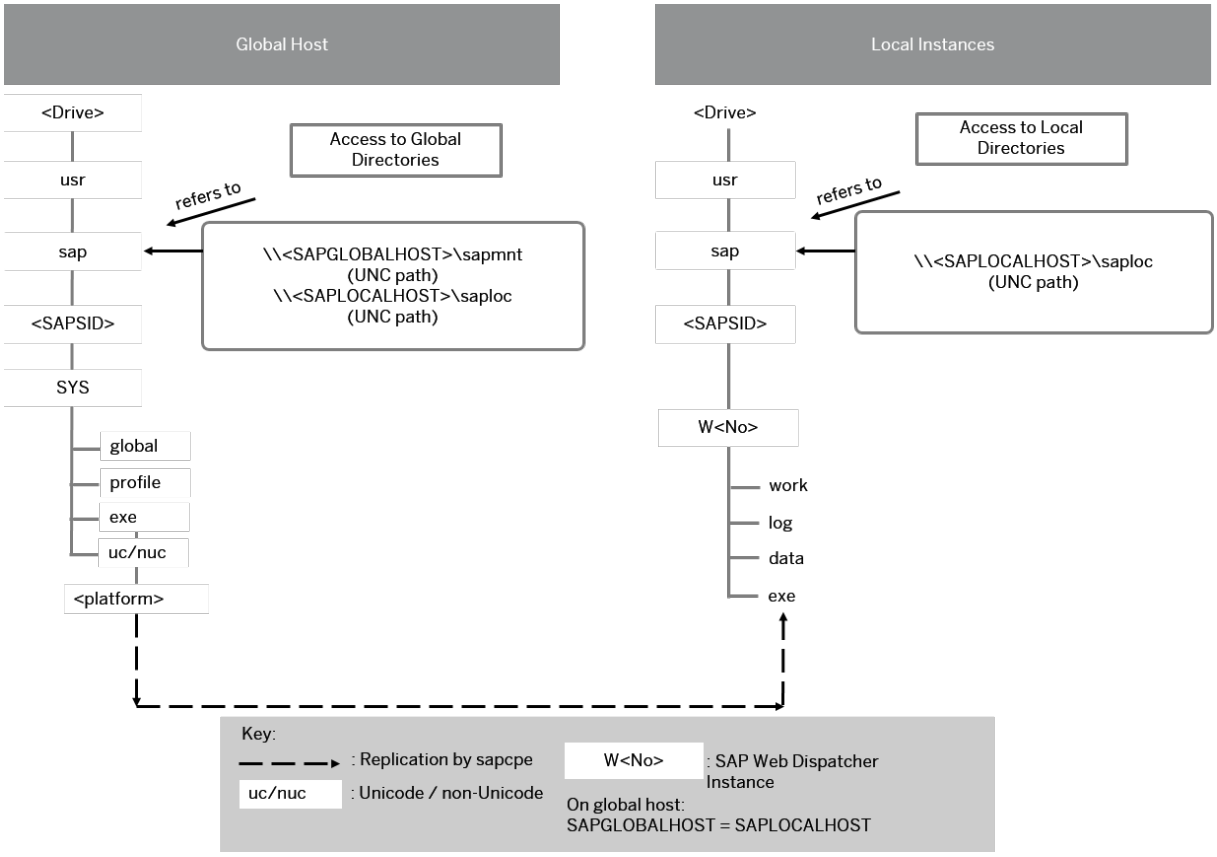

Figure 2:

The directory of the SAP Web Dispatcher instance is `W<Instance_Number>`, for example `W00`.

SAP File Directories in Detail

> **Note**
>
> The listed file system sizes are initial SAP requirements.
>
> Depending on your operating system, you might also have to add space for administrative purposes.

Table 11:

Directory Name	Description	Space Required
<Drive>:\usr\sap\<SAPSID>	\usr\sap is created and **shared** with the network share sapmnt. The \usr\sap directory contains general SAP software, global and local (instance-specific) data. For this, the following directories are created in usr\sap\<SAPSID>\SYS: • global (contains globally shared data) • profile (contains the profiles of the instance) • exe (contains executable kernel programs) The directory usr\sap\<SAPSID>\<INSTANCE> is the directory of the instance: The instance name (instance ID) of the Web Dispatcher instance is W<Instance_Number>, for example W00.	500 MB
<Drive>:\usr\sap\trans	\usr\sap\trans This directory contains SAP software for the transport of objects between SAP systems .	This value heavily depends on the use of your SAP system. For the installation, it is sufficient to use 200 MB for each SAP system instance. You can enlarge the file system afterwards.

3.6 Using Virtual Host Names

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

Prerequisites

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

Procedure

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

3.7 Preparing the Installation Media

This section describes how to prepare the installation media.

Installation media are available as follows:

- The Software Provisioning Manager 1.0 archive containing the installer.
  You always have to download the latest version of the Software Provisioning Manager 1.0 archive.
- The complete media or dedicated installation archives (`SAR` files) containing the software to be installed, which are available as follows:
  - You can use the physical installation media as part of the installation package as described in *Using the Physical Media from the Installation Package* (see the *Related Information* section below).
  - You download the complete installation media as described in *Downloading the Complete Installation Media* (see the *Related Information* section below).
  - As an alternative to downloading the complete SAP kernel media, you can download the specific **SAP kernel archives** (`SAR` files), as described in *Downloading SAP Kernel Archives (Archive-Based Installation)* (see the *Related Information* section below).

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

Related Information

Downloading the Software Provisioning Manager Archive [page 31]
Downloading the Complete Installation Media [page 34]
Using the Physical Media from the Installation Package [page 32]
Downloading Specific Installation Archives (Archive-Based Installation) [page 33]

3.7.1 Downloading the Software Provisioning Manager Archive

You always have to download and unpack the Software Provisioning Manager 1.0 archive (`SWPM10SP<Support_Package_Number>_<Version_Number>.SAR`) from the SAP Software Download Center because you must use the latest version.

Prerequisites

Make sure the latest version of the `SAPCAR` archiving tool is available on each installation host.

You require the `SAPCAR` archiving tool to be able to unpack software component archives (*.SAR files), which is the format of software lifecycle media and tools that you can download from the SAP Software Download Center.

If required, you can download the latest version of `SAPCAR` from:

http://support.sap.com/swdc > *Software Downloads* > *SUPPORT PACKAGES & PATCHES* > *By Alphabetical Index (A-Z)* > *S* > *SAPCAR*.

For more information about `SAPCAR`, see SAP Note 212876.

Procedure

1. Download the latest version of the Software Provisioning Manager 1.0 archive `SWPM10SP<Support_Package_Number>_<Version_Number>.SAR` from:

   http://support.sap.com/swdc > *Software Downloads* > *SUPPORT PACKAGES & PATCHES* > *By Alphabetical Index (A-Z)* > *S* > *SOFTWARE PROVISIONING MANAGER*

   > **Note**
   >
   > If you have an operating system version that has been initially released with SAP kernel 7.2`<X>` but is no longer supported for SAP kernel 7.40 and higher, instead of the `SWPM*.SAR` archive you must download the `RMOSSWPM*.SAR` archive for these outdated operating system versions. For more information, see About Software Provisioning Manager [page 5].

2. If you want to verify the signature of the `SWPM10SP<Support_Package_Number>_<Version_Number>.SAR` archive, execute the following commands :

   > **Note**
   >
   > In addition, check SAP Note 1680045 whether additional information is available.

```
<Path to SAPCAR>\sapcar.exe -tVvf<Path to Temporary Directory>
\SWPM10SP<Support_Package_Number>_<Version_Number>.SAR
```

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

```
<Path to SAPCAR>\sapcar.exe -xvf <Path to Temporary Directory>
\SWPM10SP<Support_Package_Number>_<Version_Number>.SAR
```

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

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

3.7.2 Using the Physical Media from the Installation Package

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

Procedure

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

   Table 12:

Installation Media	Description
Software Provisioning Manager 1.0	Software provisioning manager 1.0 archive `SWPM10SP<Support_Package_Number>_<Version_Number>.SAR`
SAP Kernel	Make sure that either the UC kernel or the NUC kernel software are available, depending on the installation option you want to choose: ○ Unicode (UC) Kernel if you want to install the SAP Web Dispatcher with kernel version 745 (installation option *SAP Web Dispatcher (Unicode)*): Folder `K_<Version>_U_<OS>` where `U` means “Unicode”. ○ Non-Unicode (NUC) Kernel if you want to install the SAP Web Dispatcher with kernel version 721 or 742 (installation option *SAP Web Dispatcher (Non-Unicode)*): Folder `K_<Version>_N_<OS>` where `N` means “non-Unicode”.

2. Make the installation media available on the installation host as follows:
   a. Download and unpack the latest version of Software Provisioning Manager as described in Downloading the Software Provisioning Manager Archive [page 31].
   b. Make the media containing the software to be installed available.

You can do this in one of the following ways:

- Copy the required media folders directly to the installation host.
- 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 the user does not yet exist, you have to create the user manually before you install the SAP system.

3.7.3 Downloading Specific Installation Archives (Archive-Based Installation)

As an alternative to downloading the complete SAP Kernel media, you can also download exactly the installation archives that are required for your installation.

Context

You must download - apart from the Software Provisioning Manager 1.0 archive which is always required for an installation - the `sapwebdisp_<Version>.sar` and `SAPHOSTAGENT<Version>.SAR` archive files.

See also section *Updating SAP Web Dispatcher* in SAP Note 908097.

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.

> **Caution**
>
> - Make sure that you always use the highest available patch level unless special patch levels are specified for the relevant package in SAP Note 1680045.
> - Make sure that you always choose `SAPEXE<Version>.SAR`, `SAPEXEDB<Version>.SAR` of the **same** SAP kernel release and extension:
>
> **Example**
>
> - If `SAPEXE<Version>.SAR` is of version **7.42 EXT**, then `SAPEXEDB<Version>.SAR` must also be of version **7.42 EXT**.
> - If `SAPEXE<Version>.SAR` is of version **7.45**, then `SAPEXEDB<Version>.SAR` must also be of version **7.45**.
>
> - If you provide the archives in one download folder, and there is more than one version of the same archive available - for example `SAPEXE<Version>.SAR` - and these versions match the product-specific requirements, the installer selects one of these archive versions. If you want a specific archive version to be used, make sure that this is the only version available in the download folder. When running system provisioning in GUI mode, you can also check in the GUI which archive is being used. So

even if there is more than one version of the same archive available in the download folder, you can select the exact archive version you want to use and enter the exact path to the required archive file.

Procedure

1. Download and unpack the latest version of Software Provisioning Manager as described in Downloading the Software Provisioning Manager Archive [page 31].
2. Go to http://support.sap.com/swdc > *Software Downloads* > *SUPPORT PACKAGES & PATCHES* > *By Category* >
3. Download the latest patch level of the following software component archives (*.SAR files) from the following paths:
   - If you want to apply installation option *SAP Web Dispatcher (Unicode)*, download `sapwebdisp_<Version>.sar` from the following path:
     > *SAP TECHNOLOGY COMPONENTS* > > *SAP WEB DISPATCHER* > *SAP WEB DISPATCHER 7.45* > `<Operating System>` >
   - If you want to apply installation option *SAP Web Dispatcher (Non-Unicode)*, download `sapwebdisp<Version>.sar` from the following path:
     > *SAP TECHNOLOGY COMPONENTS* > *SAP Web Dispatcher* > *SAP WEB DISPATCHER* `<7.21 or 7.42>` > `<Operating System>` >
   - If you want to apply installation option *SAP WEB DISPATCHER* `<7.21 or 7.42>` with SAP Kernel 7.21., download the latest patch level of `SAPCRYPTOLIB <Version>.SAR`:
     > *Additional Components* > *SAPCRYPTOLIB* > *COMMONCRYPTOLIB*`<Version>` > `<Operating System>` >
   - `SAPHOSTAGENT <Version>.SAR`:
     > *SAP Technology Components* > *SAP HOST AGENT* > *SAP HOST AGENT 7.21* > `<Operating System>` >

3.7.4 Downloading the Complete Installation Media

This section describes how you 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 the Software Provisioning Manager Archive [page 31].
2. Identify **all** download objects that belong to one medium according to one of the following:

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

- Download path or location:
  You can download installation media from the SAP Software Download Center using one of the following paths:
  - http://support.sap.com/swdc > *Software Downloads* > *INSTALLATIONS & UPGRADES* > *By Alphabetical Index (A-Z)* > `<First_Letter_Of_Your_Product>` > `<Your_Product>` > `<Your_Product_Version>`
  - http://support.sap.com/swdc > *Software Downloads* > *INSTALLATIONS & UPGRADES* > *By Category* > `<Your_Product>` > `<Your_Product_Version>`
  - For downloading the kernel media, proceed as described in the *Kernel Media* section of SAP Note 1680045.
- Material number
  All download objects that are part of an installation medium have the same material number and an individual sequence number:
  `<Material_Number>_<Sequence_Number>`

  > **Example**
  >
  > `51031387_1`
  >
  > `51031387_2`
  >
  > `...`

- 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.

3. Download the objects to the download directory.
4. To correctly re-combine the media that are split into small parts, unpack all parts into the same directory.

   In the unpacking directory, the system creates a subdirectory with a short text describing the medium and copies the data into it. The data is now all in the correct directory, the same as on the medium that was physically produced. For more information, see SAP Note 1258173.

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

4 Installation

4.1 Prerequisites for Running the Installer

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

- You need at least 300 MB of free space in the installation directory for each installation option. In addition, you need 300 MB free space for the installer executables.
- Make sure that you have defined the most important SAP system parameters as described in Basic Installation Parameters [page 18] **before** you start the installation.
- Make sure that the following ports are not used by other processes:
  - Port 21212 is used by default for communication between the installer GUI server and the installer GUI client.
    If this port cannot be used, you can assign a free port number by executing `sapinst.exe` with the following command line parameter:
    `SAPINST_DIALOG_PORT=<Port_Number>`
  - Port 4239 is used by default for displaying the feedback evaluation form at the end of the installer processing.
    The filled-out evaluation form is then sent to SAP using HTTPS.
    If this port cannot be used, you can assign a free port number by executing `sapinst.exe` with the following command line parameter:
    `SAPINST_HTTP_PORT=<Port_Number>`

4.2 Running the Installer

This section describes how to run the installation tool Software Provisioning Manager 1.0 (the “installer” for short).

Software Provisioning Manager 1.0 includes a GUI client and a GUI server, which both use Java. In the following, GUI client and GUI server are called the “installer GUI”.

This procedure describes an installation where the installer and the installer GUI are running on the same host.

Prerequisites

For more information, see Prerequisites for Running the Installer [page 36].

Procedure

1. Log on to the installation host using an account with the required user authorization to run the Installer [page 23].

   > **Caution**
   >
   > Do **not** use an existing `<sapsid>adm` user.

2. Make the installation media available.
   For more information, see Preparing the Installation Media [page 30].
3. Start the installer by double-clicking `sapinst.exe` from the directory to which you unpacked the Software Provisioning Manager archive.
   The installer GUI starts automatically by displaying the *Welcome* screen.

   > **Note**
   >
   > If you need to assign a virtual host name to the instance to be installed and you do not want to assign it by entering it as a parameter using the installer screens (see Basic Installation Parameters [page 18]), 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 installer with the following command:
   > **`sapinst.exe SAPINST_USE_HOSTNAME=<Virtual_Host_Name>`** (in a command prompt)
   > **`.\sapinst.exe SAPINST_USE_HOSTNAME=<Virtual_Host_Name>`** (in `PowerShell`)
   >
   > For more information, see Using Virtual Host Names [page 29].

4. On the *Welcome* screen, execute the required option:
   - To install a new SAP Web Dispatcher instance, choose one of the following:

     Table 13:

Option	Description
Generic Options > *SAP Web Dispatcher (Non-Unicode)*	Installs a non-Unicode SAP Web Dispatcher instance using *SAP WEB DISPATCHER* `<7.21 or 7.42>`.
Generic Options > *SAP Web Dispatcher (Unicode)*	Installs a Unicode SAP Web Dispatcher instance using *SAP WEB DISPATCHER 7.45*.

   - To rename an existing SAP Web Dispatcher instance, go to *System Rename* and choose: *Distributed System* > *System Rename for Web Dispatcher Instance*
   - To uninstall an existing SAP Web Dispatcher instance, go to *Generic Options* > `<Database>` > *Uninstall* and choose:

5. Choose *Next*.
6. If the installer prompts you to log off from your system, log off and log on again.
   The installer restarts automatically.
7. Follow the instructions on the installer screens and enter the required parameters.

   > **Note**
   >
   > To find more information on each parameter during the input phase of the installation, position the cursor on the required parameter and press `F1`.

   After you have entered all requested input parameters, the installer displays the *Parameter Summary* screen. This screen shows both the parameters that you entered and those that the installer set by default. If required, you can revise the parameters before starting the installation.
8. To start the installation, choose *Start*.
   The installer starts the installation and displays the progress of the installation. When the installation has finished, the installer shows the message: `Execution of <Option_Name> has completed`.
9. We recommend deleting all files in the directory `%userprofile%\.sdtgui`.
10. If you copied the installer software to your hard disk, you can delete these files when the installation has successfully completed.

4.3 Additional Information About the Installer

The following sections provide additional information about the installer:

- Useful Information About the Installer [page 38]
- How to Avoid Automatic Logoff by the installer [page 39]
- Interrupted Installation [page 40]
- Performing a Remote Installation [page 42]
- Starting the Installer GUI Separately [page 44]
- Running the Installer in Accessibility Mode [page 46]
- Troubleshooting with the Installer [page 47]

4.3.1 Useful Information About the Installer

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

- The installer creates the installation directory `sapinst_instdir`, where it keeps its log files, and which is located directly in the `%ProgramFiles%` directory. If the installer is not able to create `sapinst_instdir` there, it tries to create `sapinst_instdir` in the directory defined by the environment variable `TEMP`.
- For each option, the installer creates a subdirectory located in the `sapinst_instdir` directory.
- The installer extracts itself to a temporary directory (`TEMP`, `TMP`, `TMPDIR`, or `SystemRoot`). These executables are deleted after the installer has stopped running.
  Directories called `sapinst_exe.xxxxxx.xxxx` sometimes remain in the temporary directory. You can safely delete them.

The temporary directory also contains the log file `dev_selfex.out` from the extraction process, which might be useful if an error occurs.

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

- To see a list of all available installer properties, go to the directory `%TEMP%\sapinst_exe.xxxxxx.xxxx` after you have started the installer, and enter the following command:
  `sapinst.exe -p`
- If you need to run the installer in accessibility mode, proceed as described in Running the Installer in Accessibility Mode [page 46].
- If required, stop the installer by choosing *SAPinst* > *Exit Process* in the installer GUI menu.

> **Note**
>
> If you need to terminate the installer, choose *File* > *Close GUI only* in the menu of the *Program Starter* window.

- If you want to install an SAP system in unattended mode, see SAP Note 2230669 which describes an improved procedure using `inifile.params`.

4.3.2 How to Avoid Automatic Logoff by the Installer

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 domain installation, the account needs to be both a member of the local `Administrators` group and the domain `Admins` group. For a local installation, the account needs to be a member of the local group `Administrators` group.

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 installer assigns them and automatically logs the account off to activate them. To avoid the installer 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.

> **Caution**
>
> Be aware that domain policies override locally defined policies. This means that if you want to grant domain administrator rights to a user who belongs to the local `Administrators` group, make sure that you have also defined domain administrator rights for this user on domain level.

1. Windows Server 2012 (R2): Press `Ctrl` + `Esc` and choose *Administrative Tools* > *Local Security Policy*.
2. Windows Server 2008 (R2): Choose *Start* > *Control Panel* > *Administrative Tools* > *Local Security Policy*.
3. In the *Local Security Settings* window, choose *Local Policies* > *User Rights Assignment.*.
4. Double-click the required right under *Policy* and choose *Add User or Group*.
5. In the *Select Users and Groups* window, choose the required user and choose *Add*.
   The selected user appears in the box below.
6. Confirm your entry and then repeat the steps for each remaining policy that the user requires for the installation.
7. Log off and log on again to apply the changes.

More Information

Required User Authorization for Running the Installer [page 23]

4.3.3 Interrupted Processing of the Installer

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

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

  > **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 16:

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

Procedure

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

1. Log on to the installation host as a user with the required permissions as described in Running the Installer [page 36].
2. Make sure that the installation media are still available on the installation host.
   For more information, see Preparing the Installation Media [page 30].

   ➡ Recommendation

   Make the installation media available **locally** . For example, if you use remote file shares on other Windows hosts, CIFS shares on third-party SMB-servers, or Network File System (NFS), reading from media mounted with NFS might fail.

3. Restart the installer by double-clicking **`sapinst.exe`** from the directory to which you unpacked the Software Provisioning Manager archive.
4. 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.
5. On the *What do you want to do?* screen, decide between the following alternatives and continue with *Next*:

Table 17:

Alternative	Behavior

Run a new option	The installer does not continue the interrupted installation option. Instead, it moves the content of the old installation directory and all installation-specific files to a backup directory. Afterwards, you can no longer continue the old installation option.
	
	The following naming convention is used for the backup directory:
	
	`log_<Day>_<Month>_<Year>_<Hours>_<Minutes>_<Seconds>`
	
	Example
	
	`log_01_Oct_2008_13_47_56`
	
	Note
	
	All actions taken by the installation before you stopped it (such as creating directories or users) are not revoked.
	
	Caution
	
	The installer moves all the files and folders to a new log directory, even if these files and folders are owned by other users. If there are any processes currently running on these files and folders, they might no longer function properly.

Continue with the old option	The installer continues the interrupted installation from the point of failure.

4.3.4 Performing a Remote Installation

You use this procedure to install your SAP system on a **remote** host. In this case, the installer runs on the **remote host**, and the installer GUI runs on the **local** host. The local host is the host from which you control the installation with the installer GUI. The installer GUI connects using a secure SSL connection to the installer.

If your security policy requires that the person performing the installation by running the installer GUI on the local host is not allowed to know administrator credentials on the remote 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 have to confirm that the user is a trusted one. For more information, see SAP Note 1745524.

Prerequisites

- The remote host meets the prerequisites for starting the installer as described in Prerequisites for Running the Installer [page 36].
- Both computers are in the same network and can ping each other.

To test this:

1. Log on to your remote host and enter the command: **ping <Local_Host>**
2. Log on to the local host and enter the command: **ping <Remote_Host>**

- If you need to specify another operating system user with the `SAPINST_REMOTE_ACCESS_USER` command line parameter, make sure that this user exists on the remote host.

Procedure

1. Log on to your remote host as a user that has the required authorization for running the installer [page 23].
2. Make the installation media available on your remote host.
   For more information, see Preparing the Installation Media [page 30].
3. Open a command prompt and change to the directory to which you unpacked the Software Provisioning Manager 1.0 archive.
4. Check the version of the `sapinst` executable by entering the following command:
   sapinst.exe -sfxver
   The version of the `sapinst` executable must be exactly the same as the version of the `sapinstgui` executable on the local host (see also Starting the Installer GUI Separately [page 44]).
5. Start the installer by executing the following command:
   sapinst.exe -nogui

   > **Note**
   >
   > If you need to specify another operating system user for authentication purposes, enter the following command:
   >
   > **sapinst.exe -nogui SAPINST_REMOTE_ACCESS_USER=<Specified_OS_User>**

   > **Note**
   >
   > If you need to assign a virtual host name to the instance to be installed and you do not want to assign it by entering it as a parameter using the installer screens (see Basic Installation Parameters [page 18]), 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 1.0 archive.
   > 2. Start the installer with the following command:
   > **sapinst.exe -nogui SAPINST_USE_HOSTNAME=<Virtual_Host_Name>** (in a command prompt)
   > **.\sapinst.exe -nogui SAPINST_USE_HOSTNAME=<Virtual_Host_Name>** (in `PowerShell`)
   >
   > For more information, see Using Virtual Host Names [page 29].

   The installer now starts and waits for the connection to the installer GUI. You see the following in the *Program Starter* window:
   `guiengine: no GUI connected; waiting for a connection on host <Host_Name>, port <Port_Number> to continue with the installation`

6. Start the installer GUI on your **local** host as described in Starting the Installer GUI Separately [page 44].

4.3.5 Starting the Installer GUI Separately

You use this procedure to start the installer GUI separately.

You might need to start the installer GUI separately in the following cases:

- You closed the installer GUI using *File* > *Close GUI only* from the installer menu while the installer is still running.
- You want to perform a remote installation, where the installer GUI runs on a different host from the installer. For more information, see Performing a Remote Installation [page 42].

Prerequisites

- The host on which you want to start the installer GUI meets the prerequisites for starting the installer as described in Prerequisites for Running the Installer [page 36].

  > **Note**
  >
  > If you want to run the installer on a UNIX host, make sure that you meet the prerequisites for the installer listed in the relevant UNIX guide.

Procedure

In this procedure, the following variables are used: `<Remote_Host>` is the name of the remote host, and `<Port_Number_Gui_Server_To_Gui_Client>` is the port the GUI server uses to communicate with the GUI client (21212 by default).

> **Note**
>
> If you want to run the installer GUI on a remote host, it is mandatory to start the installer using the `-nogui` property. If you have already started the installer without the `-nogui` property and want to run the GUI on a different host, you have to exit the installation process by choosing *SAPinst* > *Exit Process* and then follow the steps described in Interrupted Installation [page 40]. Use the `-nogui` property to restart the installer and start the installer GUI on the intended host.

Starting the Installer GUI on Windows

1. Make the installer software available on the host on which you want to start the installer GUI.
   For more information, see Preparing the Installation Media [page 30].

2. Start the installer GUI by executing the `sapinstgui` executable with the appropriate command line parameters:
   - If you want to perform a remote installation, proceed as follows:
     1. Check the version of `sapinstgui.exe` by entering the following command:
        `<Path_To_Unpack_Directory>\sapinstgui.exe -sfxver`
        The version of the `sapinstgui` executable must be exactly the same as the version of the `sapinst` executable on the remote host (see also Performing a Remote Installation [page 42]).
     2. Start the installer GUI by entering the following command:
        `<Path_To_Unpack_Directory>\sapinstgui.exe -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`
   - If you closed the installer GUI using *File* > *Close GUI only* and want to reconnect to the installer, proceed as follows:
     1. If you are performing a local installation with the installer and the installer GUI running on the **same** host, execute the following command:
        `<Path_To_Unpack_Directory>\sapinstgui.exe -port <Port_Number_Gui_Server_To_Gui_Client>`
     2. If you are performing a remote installation with the installer and the installer GUI running on **different** hosts, execute the following command:
        `<Path_To_Unpack_Directory>\sapinstgui.exe -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`
3. The installer GUI starts and connects to the installer.

Starting the Installer GUI on UNIX

1. Make the installer software available on the host on which you want to start the installer GUI.
   For more information, see Preparing the Installation Media [page 30].
2. Start the installer GUI by executing the `sapinstgui` executable with the appropriate command line parameters:
   - If you want to perform a remote installation, proceed as follows:
     1. Check the version of the `sapinstgui` executable by entering the following command:
        `<Path_To_Unpack_Directory>/sapinstgui -sfxver`
        The version of the `sapinstgui` executable must be exactly the same as the version of the `sapinst` executable on the remote host (see also Performing a Remote Installation [page 42]).
     2. Start the installer GUI by entering the following command:
        `<Path_To_Unpack_Directory>/sapinstgui -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`
   - If you closed the installer GUI using *File* > *Close GUI only* and want to reconnect to the installer, proceed as follows:
     1. If you are performing a local installation with the installer and the installer GUI running on the same host, execute the following command:
        `<Path_To_Unpack_Directory>/sapinstgui -port <Port_Number_Gui_Server_To_Gui_Client>`
     2. If you are performing a remote installation with the installer and the installer GUI running on different hosts, execute the following command:
        `<Path_To_Unpack_Directory>/sapinstgui -host <Remote_Host> -port <Port_Number_Gui_Server_To_Gui_Client>`
3. The installer GUI starts and connects to the installer.

4.3.6 Running the Installer in Accessibility Mode

You can also run the installer in accessibility mode. The following features are available:

- Keyboard access:
  This feature is available for all operating systems.
- High-contrast color:
  This feature is derived from the Windows display properties. You can use it either for a local installation or for a remote installation.
- Custom font setting:
  This feature is derived from the Windows display properties. You can use it either for a local installation or for a remote installation.

Procedure

Activating and Adjusting Accessibility Settings on Windows

You first have to activate and adjust the relevant settings for the font size and color schemes **before** you start the installer or the installer GUI.

> **Note**
>
> The following procedure applies for Windows Server 2008 and might be different when using another Windows operating system.

1. Right click on your Windows desktop and choose *Personalize*.
2. Choose *Adjust font size (DPI)* and choose *Larger scale (120 DPI)*.
   To define other font size schemes, choose *Custom DPI*.
3. In the right-hand pane, select *Window Color and Appearance*.
   Select a color scheme from the *Color scheme* dropdown box.
   To define your own color schemes, choose *Advanced*.

Running the Installer in Accessibility Mode

You can either perform a local installation, where the installer and the installer GUI are running on the same host, or a remote installation, where the installer and the installer GUI are running on different hosts.

- Local installation:
  Start the installer as described in Running the Installer [page 36] by executing the following command:
  ```
  sapinst.exe -accessible
  ```
- Remote installation:
  1. Start the installer on the remote host by executing the following command from the command line as described in Performing a Remote Installation [page 42]:
     ```
     sapinst.exe -nogui
     ```
  2. Start the installer GUI on the local host by executing the following command from the command line as described in Starting the installer GUI Separately for a Remote Installation [page 44]:
     ```
     sapinstgui.exe -accessible -host <Remote_Host> -port
     <Port_Number_Gui_Server_To_Gui_Client>
     ```

4.3.7 Troubleshooting with the Installer

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

If an error occurs, the installer:

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

Procedure

1. Check SAP Note 1548438 for known installer issues.
2. To view the log file, choose *View Logs*.
3. If an error occurs during the dialog or processing phase, do one of the following:
   - Try to solve the problem.
   - Abort the installer by choosing *Stop* from the error message or *SAPinst* > *Exit Process* in the tool menu.
     For more information, see Interrupted Installation [page 40].

   Continue by choosing *Retry*.
4. Check the log and trace files of the GUI server and the installer GUI in the directory `%userprofile%\.sdtgui\` for errors.
   - If the GUI server or the installer GUI do not start, check the file `sdtstart.err` in the current `%userprofile%` directory.
   - If the installer GUI aborts without an error message, restart the installer GUI as described in Starting the Installer GUI Separately [page 44].
5. If you cannot resolve the problem, report an incident using component BC-INS.
   For more information about using subcomponents of BC-INS, see SAP Note 1669327.

5 Post-Installation Activities

5.1 Logging on to the SAP Web Dispatcher Management Console

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

Context

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`

   Example

   `https://plx282:44300/sap/wdisp/admin`

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, see the Web Dispatcher documentation in the SAP Library [page 11] at: *Application Help* > *Function-Oriented View* > *Application Server Infrastructure* > *Components of SAP NetWeaver Application Server* > *SAP Web Dispatcher* > *Administration of the SAP Web Dispatcher* > *Using the Web Administration Interface* > *Area menu* > *Section "HTTP Handler"*

5.2 SAP Web Dispatcher Configuration

After installing SAP Web Dispatcher, you must configure it to be able to use it.

For more information, see the Web Dispatcher documentation in the SAP Library [page 11] at: *Application Help* > *Function-Oriented View* > *Application Server Infrastructure* > *Components of SAP NetWeaver Application Server* > *SAP Web Dispatcher*

6 Additional Information

6.1 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.

Procedure

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

6.2 Checking and Changing the Paging File Settings on Windows Server 2012 (R2)

Use

This section describes how to check and change the paging file size on Windows Server 2012 (R2) with PowerShell.

The PowerShell commands also work in previous Windows versions where PowerShell is available.

> **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

1. Start Windows PowerShell.
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:
   `(Get-WmiObject Win32_Pagefile) -eq $null`
   If *Automatic manage pagefile size for all devices* is enabled, the output value is *True*.
   If necessary, disable *Automatic manage pagefile size for all devices* with the following command:
   `$sys = Get-WmiObject Win32_Computersystem -EnableAllPrivileges`
   `$sys.AutomaticManagedPagefile = $false`
   `$sys.put()`
3. Check the size of the paging files with the following command:
   `Get-WmiObject WIN32_Pagefile | Select-Object Name, InitialSize, MaximumSize, FileSize`
   The output looks like the following:

```
                Name                 InitialSize
MaximumSize              FileSize
                ----                 -----------
-----------              --------
                C:\pagefile.sys                0                      0
41943040000
                E:\pagefile.sys            40000                  80000
41943040000
```

   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:

`$Pagefile = Get-WmiObject Win32_PagefileSetting | Where-Object {$_.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:

```
$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:

```
$pagefile = Get-WmiObject Win32_PagefileSetting | Where-Object {$_.name -eq "E:
\pagefile.sys"}
$pagefile.delete()
```

6.3 Starting and Stopping with the SAP Microsoft Management Console (SAP MMC)

Use

You have to check that you can start and stop the Web Dispatcher after the installation using the SAP Microsoft Management Console (SAP MMC).

You can start and stop the instance by using the SAP MMC in one of the following ways:

- By using the SAP MMC that was installed by the installer automatically on the host of the Web Dispatcher.
- By using the SAP MMC on another host of your existing SAP system landscape, If the SAP MMC is configured for central system administration.

Procedure

1. Log on as user `<sapsid>adm`.
2. Start the SAP MMC by choosing *Start* > *All Programs* > *SAP Management Console*.
3. Right-click the icon of the Web Dispatcher instance under the *SAP systems* node and choose *Start* or *Stop*.

More Information

For more information, see the SAP Library [page 11] at:

- SAP systems based on SAP NetWeaver for Banking Services from SAP:
  Function-Oriented View > *Application Server ABAP* > *Administration Tools for AS ABAP* > *Monitoring in the CCMS* > *SAP Microsoft Management Console: Windows*
- SAP systems based on SAP NetWeaver Mobile 7.1 / 7.1 including enhancement package 1:
  Function-Oriented View > *Application Server ABAP* > *Administration Tools for AS ABAP* > *Monitoring in the CCMS* > *SAP Microsoft Management Console: Windows*
- SAP systems based on SAP NetWeaver Process Integration 7.1 / 7.1 including enhancement package 1:
  Function-Oriented View > *ABAP Technology / Application Server ABAP* > *Administration Tools for AS ABAP* > *Monitoring in the CCMS* > *SAP Microsoft Management Console: Windows*
- SAP systems based on SAP NetWeaver 7.3 and higher:
  Solution Life Cycle Management > *Solution Monitoring* > *Monitoring in the CCMS* > *SAP Microsoft Management Console: Windows*

6.4 Uninstall

Use

The following procedure describes how to uninstall a Web Dispatcher using the installer.

Procedure

1. Start the Installer [page 36].
2. On the Welcome screen, choose *Generic Installation Options* > `<Database>` > *Uninstall* > *Uninstall SAP Systems or Single Instances* >.
3. Follow the instructions in the installer screens.

Important Disclaimers and Legal Information

Coding Samples

Any software coding and/or code lines / strings ("Code") included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended to better explain and visualize the syntax and phrasing rules of certain coding. SAP does not warrant the correctness and completeness of the Code given herein, and SAP shall not be liable for errors or damages caused by the usage of the Code, unless damages were caused by SAP intentionally or by SAP's gross negligence.

Accessibility

The information contained in the SAP documentation represents SAP's current view of accessibility criteria as of the date of publication; it is in no way intended to be a binding guideline on how to ensure accessibility of software products. SAP in particular disclaims any liability in relation to this document. This disclaimer, however, does not apply in cases of willful misconduct or gross negligence of SAP. Furthermore, this document does not result in any direct or indirect contractual obligations of SAP.

Gender-Neutral Language

As far as possible, SAP documentation is gender neutral. Depending on the context, the reader is addressed directly with "you", or a gender-neutral noun (such as "sales person" or "working days") is used. If when referring to members of both sexes, however, the third-person singular cannot be avoided or a gender-neutral noun does not exist, SAP reserves the right to use the masculine form of the noun and pronoun. This is to ensure that the documentation remains comprehensible.

Internet Hyperlinks

The SAP documentation may contain hyperlinks to the Internet. These hyperlinks are intended to serve as a hint about where to find related information. SAP does not warrant the availability and correctness of this related information or the ability of this information to serve a particular purpose. SAP shall not be liable for any damages caused by the use of related information unless damages have been caused by SAP's gross negligence or willful misconduct. All links are categorized for transparency (see: http://help.sap.com/disclaimer).

Open Source Software and Third Party Components

Please refer to https://scn.sap.com/docs/DOC-42044 for information respecting open source software components made available by SAP as part of SAP NetWeaver and any specific conditions that apply to your use of such open source software components. Please refer to https://scn.sap.com/docs/DOC-42045 for information relating to SAP's use of third party software with or within SAP NetWeaver.

go.sap.com/registration/contact.html

© 2017 SAP SE or an SAP affiliate company. All rights reserved.
No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company. The information contained herein may be changed without prior notice.
Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.
These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.
SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.
Please see http://www.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.