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SAP NetWeaver Master Data Management 7.1
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MDM Installation Guide For UNIX

with Software Provisioning Manager 1.0

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 - [MDM Component Overview \[page 10\]](#)
 - [Required Documentation for Installing MDM \[page 11\]](#)
 - [Planning the MDM System Landscape \[page 13\]](#)
 - [Lightweight Directory Access Protocol \[page 15\]](#)
 - [Hardware and Software Requirements \[page 16\]](#)
 - [MDM Port Requirements \[page 20\]](#)
 - [Basic SAP System Parameters \[page 21\]](#)
 - [Creating Operating System Users and Groups \[page 24\]](#)
 - [Local Directories \(SAP System\) \[page 28\]](#)
 - [Exporting and Mounting Directories via NFS for Linux \[page 32\]](#)
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 - [Installation of MDM Servers \[page 42\]](#)
 - [Useful Information about Software Provisioning Manager \[page 51\]](#)
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 - [Installing Additional MDM Components \[page 59\]](#)
 - [Installing and Configuring the Database \[page 60\]](#)
 - [Oracle DBMS \[page 61\]](#)
 - [IBM DB2 \[page 70\]](#)
 - [Downloading the Archive \[page 70\]](#)
 - [Downloading the CLI Driver License \[page 71\]](#)
 - [BIND and GRANT with SAP NetWeaver AS Java \[page 73\]](#)
 - [BIND and GRANT without SAP NetWeaver AS Java \[page 74\]](#)
 - [Verifying SSL Communication \[page 93\]](#)
 - [Setting Up SSL in a Master/Slave Environment \[page 94\]](#)
 - [Using CLIX with SSL \[page 95\]](#)
 - [Configuring MDM Servers \[page 95\]](#)
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1 Introduction to MDM Installation

This installation guide describes how to install the SAP NetWeaver Master Data Management (MDM) 7.1 components on supported UNIX platforms.

The guide also describes the installation and configuration of released databases for use with MDM.

Caution

The installation procedure for MDM 7.1 servers differs significantly from the installation procedure for MDM 5.5. MDM 7.1 servers are installed as SAP systems using the software provisioning manager installation tool and SAP Instance Framework as of software provisioning manager SP18. The installation procedure for MDM clients and additional components has not changed.

This document should be used by system administrators and technology consultants who are installing the MDM system.

For information about installation of MDM Windows clients, see the *MDM Installation Guide for Windows* at help.sap.com/nwmdm71.

1.1 MDM Component Overview

MDM Servers

The following MDM servers are the foundation of the MDM software. These components can be installed on supported platforms using the software provisioning manager:

- Master Data Server (MDS)
- Master Data Import Server (MDIS)

MDM Windows Clients

The following MDM clients enable you to administrate the system and manage your data. These components can be installed on Windows using a simple MDM-specific installation routine:

- MDM Console
- MDM CLIX

Note

The administration command line tool MDM CLIX is automatically installed with the MDS. You only need to install it manually for remote access to MDS, for example, from a local PC.

- MDM Data Manager (including MDM Workflow)
- MDM Import Manager
- MDM Syndicator
- MDM Language Selector
- MDM Image Manager

Additional MDM Components

The following additional MDM components enable you to connect MDM to other applications. These components can be deployed on their respective platforms:

- MDM Java API and MDM Connector
- MDM ABAP API
- MDM Portal Content

1.2 Required Documentation for Installing MDM

The following sections list the documentation needed for the installation:

- Information on the SAP Help Portal
- SAP Installation Notes

Information on SAP Help Portal

The SAP NetWeaver MDM 7.1 Documentation Center on the SAP Help Portal at help.sap.com/nwmdm71  provides useful information and access to the complete MDM documentation set, including all the MDM installation and planning guides.

SAP Installation Notes

It is essential that you read the following SAP Notes before starting the installation. These SAP Notes contain the most recent information about the installation as well as corrections to the installation documentation.

SAP Note Number	Title	Description
2867976 	SAP NetWeaver MDM 7.1 SP21 Release	This note contains information about the current MDM 7.1 support package.
2740024 	SAP NetWeaver MDM 7.1 SP20 Release	This note contains information about the current MDM 7.1 support package.
2751450 	SAP Systems on Windows Server 2019	This note contains information about deploying and using SAP systems on Windows Server 2019.
2462918 	SAP NetWeaver MDM 7.1 SP19 Release	This note contains information about the current MDM 7.1 support package.
2382656 	SAP NetWeaver MDM 7.1 SP18 Release	This note contains information about the current MDM 7.1 support package.
2367941 	MDM Servers Installation Moved to software provisioning manager	SAP NetWeaver MDM 7.1 SP17 and above installation/update processes are now part of the Software Logistics Toolset 1.0 (Software Provisioning Manager 1.0 SP18 and higher when available).
1680045 	MDM Servers Installation with software provisioning manager SP19	The SAP NetWeaver MDM 7.1 SP18 installation/update processes are now part of the Software Logistics Toolset 1.0 (Software Provisioning Manager 1.0 SP19 and higher when available).
1249503 	MDM Installation Note	Most recent information and best practices about the MDM installation procedure. <i>The MDM Installation Note</i> complements this <i>MDM Installation Guide</i> .
2224122 	SAP NetWeaver MDM 7.1 SP16 Release	This note contains information about the current MDM 7.1 support package.
1244358 	MDM 7.1 Release Restriction Note	This note contains the restrictions of the current MDM 7.1 support package.

1.3 How to Use the MDM Installation and Upgrade Guides

When planning a new MDM installation, follow the instructions in the relevant *MDM Installation Guide* for your platform. When planning an upgrade from MDM 5.5, or from any previous MDM 7.1 support package (SP) release, you should also refer to the *MDM Upgrade Guide* for the following information before you begin the upgrade process:

- Preparatory and pre-installation tasks
- Post installation setup and configuration tasks required to complete the upgrade process.

2 Planning the MDM System Landscape

When planning the MDM system landscape, familiarize yourself with the following documentation at help.sap.com/nwmdm71:

- *MDM Master Guide*
- *MDM Sizing Guide*
- Introduction to this guide

Get informed about the supported platforms and databases, and note that when upgrading NW MDM from SP16 and earlier versions to SP17, the framework must be updated using the software provisioning manager on top of the instances update. The MDM 7.1 Product Availability Matrix (PAM) is at <https://support.sap.com/pam> (search for MDM 7.1). If you are planning an MDM upgrade installation (from release 5.5 or from a previous SP release of 7.1), read the *MDM Upgrade Guide* first (available at help.sap.com/nwmdm71). For more information, refer to the following sections in this guide:

- [Software Provisioning Manager Installation Options \[page 48\]](#)
- [Updating MDM Servers \[page 99\]](#)

MDM System Landscapes

An MDM system landscape is typically structured as follows:

- One separate UNIX host, IBM i host, or Windows server host with the MDM servers and the database (standard system). You can distribute the different MDM servers to several hosts (distributed system).
- Several different Windows machines with multiple combinations of MDM clients for administrators, master data specialists and end users.
- More than one installation of additional MDM components for developers, for example, on Web or SOAP servers.

Before you install MDM 7.1 as part of the implementation of a SAP NetWeaver scenario, familiarize yourself with the contents of the corresponding *SAP NetWeaver Master Guide*. The Master Guide is the central document for the implementation of SAP NetWeaver solutions and scenarios. This document lists the components and third-party applications that are required for each scenario in an SAP NetWeaver solution, and refers to the required installation and upgrade guides. It also defines the installation sequence for the scenarios of the corresponding SAP NetWeaver solution.

The *MDM Master Guide* and all other MDM documentation is on the SAP Help Portal at help.sap.com/nwmdm71.

2.1 Central or Distributed Installation

Before you install the MDM servers, decide whether to perform a central installation (on one host) or distributed installation (on different hosts). The installation type affects how the user account information is stored and accessed.

Distributed Installation

In a distributed installation, the MDM servers are stored on several hosts.

In this case we highly recommend that you store the user account information in a central database, such as NIS or Yellow Pages.

For more information, see [Creating Operating System Users and Groups \[page 24\]](#).

Central Installation

In a central installation, all user account information is stored locally on one host and is not visible to any other hosts in the system. To run the MDM servers and the database on a single machine, perform a central installation.

2.2 High Availability

High availability (HA) is a major consideration when planning business systems that require system reliability.

For MDM, there are different approaches that support this objective, for example, system redundancy using load and balancing tools, backup strategies and cluster management software.

If you plan to set up MDM in a landscape that provides high availability, see the *High Availability* section in the *MDM Solution Operation Guide* at help.sap.com/nwmdm71.

2.3 Multiple Components on One Database

MDS can be installed in an MCOD environment, sharing the same database with other SAP components, such as SAP ERP ECC or SAP NetWeaver Application Server. Generally, several components sharing the same database resources affect overall performance; this must be taken into consideration when sizing the hardware and system.

Note

For MCOD on an Oracle database, check and adjust the temporary tablespace after the MDM installation. For more information, see [Adjusting Temporary Tablespace for MCOD \[page 64\]](#).

2.4 Lightweight Directory Access Protocol

MDM supports the Lightweight Directory Access Protocol (LDAP) for user authorization management. If you plan to use LDAP with MDM, see the *LDAP Support* section in the *MDM Security Guide* at help.sap.com/nwmdm71

3 Preparation for MDM Installation

To prepare for an MDM installation, learn about SAP systems and make some checks and settings on the platform designated for MDM installation.

The chapter describes the following:

- [Hardware and Software Requirements \[page 16\]](#)
- [Basic SAP System Parameters \[page 21\]](#)
- [Creating Operating System Users and Groups \[page 24\]](#)
- [File Systems \[page 29\]](#)
- [Preparing the Installation Files \[page 36\]](#)

3.1 Hardware and Software Requirements

Check that your hosts meet the hardware and software requirements for your operating system (OS), the MDM server instances, and the MDM clients. The following topics describe the requirements for running the software provisioning manager and MDM servers and how to check these requirements.

Caution

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

Prerequisites

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

Caution

To monitor MDM using the SAP Solution Manager, the MDM host name must also meet the requirements listed in SAP Note [1278029](#) .

3.1.1 Checking Requirements

Procedure

1. Check the supported operating system releases in the MDM 7.1 Product Availability Matrix (PAM) at <https://support.sap.com/pam> (search for MDM 7.1).
2. Check that your system meets the minimum requirements listed in the following section.
3. If you are installing a production system, the values provided by the [Prerequisite Checker \[page 17\]](#) and the following section in this guide are not sufficient. In addition, do the following:
 - a. Read the *MDM Sizing Guide* available at help.sap.com/nwmdm71.
 - b. Contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing depending on parameters such as:
 - How intensively the applications are to be used
 - Number of users
 - Data Model of your MDM repositories
 - Number of records in the MDM repositories
 - Number of large binary objects (for example, images and PDFs) in the repositories

3.1.2 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

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 \[page 37\]](#).
2. Make either the separate SAPEXE<Version>.SAR archive or the complete kernel medium available as described in [Preparing the Installation Files \[page 36\]](#).
3. Start the Software Provisioning Manager as described in [Running Software Provisioning Manager \[page 45\]](#).
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 \[page 37\]](#)

3.1.3 Requirements for UNIX Installation

This section lists the minimum hardware and software requirements for installing and running MDM servers on released UNIX platforms. A production system must meet the minimum requirements listed in the tables below. For more information about how to check the requirements, see the *OS documentation*.

Hardware Requirements

Requirement Type	Requirement
Minimum disk space	SAP system files: 2 GB Temporary disk space for the installation: 1 GB
Minimum RAM	5 GB
Minimum swap space	1 times RAM plus 10 GB

Software Requirements

Requirement Type	Requirement
UNIX operating systems for MDM servers	English international 64-bit versions of the released UNIX platforms. For more information, see SAP Note 2882432 
 Note HP-UX information has been removed from this documentation, as all HP-UX versions on the 31st December 2025 have reached the end of standard support. On January 1st 2026, all HP-UX releases will be "end-of-support" by HPE. For more information, see SAP Note 3120243 . Though an extended "Mature Support" to December 31 2028 is still available, HPE will no longer provide software bug fixes, updates and patches. If you still want to use HP-UX, use SWPM10SP35_7 .SAR. For more information, see SAP Note 3261541 .	
Network File System (NFS)	If MDM servers are installed decentrally, Network File System (NFS) must be installed.

Requirement Type	Requirement
TCP/IP access	MDIS and MDSS must have TCP/IP access to the MDS. This connection must be on a local network to be effective. Starting from MDM 7.1 SP07, each MDM instance can use either regular TCP/IP ports, or SSL TCP/IP ports for secure communication (if this was configured). For more information on the TCP/IP ports, see SAP Note 1487853. Check the setup of your network, operating system, and firewalls, if the MDM servers can be accessed through their dedicated TCP/IP ports. You set the ports during the installation. See the following table for regular TCP/IP ports and SSL TCP/IP ports (starting from MDM 7.1 SP07). If you already have an MDM Server installed on your machine and you install an additional instance of MDS or MDIS, the default TCP/IP ports will be created in the following format, where xx is the instance number: • 5xx50 for the regular TCP/IP ports • 5xx51 for the SSL TCP/IP ports
Value of file descriptors on the MDM server	Use the <code>ulimit</code> command to verify that the value of the file descriptors' kernel parameter is set correctly on the MDM server. For more information, see SAP note 1522123.

3.1.4 MDM Port Requirements

Service	Port Rule	External	Default	Range (min-max)*	Comment
MDS	5NN50	+	59950	50050-59950	Main server
MDIS	5NN50	+	59750	50050-59950	Import Server
MDS SSL	5NN51	+	59951	50051-59951	Main server SSL. Defaults to +1 of the MDS
MDIS SSL	5NN51	+	59751	50051-59951	Import Server SSL. Defaults to +1 of the MDIS

* Recommendation only

3.2 Basic SAP System Parameters

This topic provides an overview of the basic parameters that make up an SAP system, like system IDs, users, and so on.

The software provisioning manager asks whether to run the installation in *Typical* or *Custom* mode. If you choose *Typical*, the software provisioning manager provides automatic default settings and you only respond to a minimum number of prompts. However, you can still change any of the default settings on the parameter summary screen. The following tables list the basic system parameters that you must specify before installing your SAP system in typical and in custom mode.

For all other SAP system parameters, use the tool help on the software provisioning manager dialogs.

Parameter	Description
SAP System ID <SAPSID>	The SAP system ID <SAPSID> identifies the entire SAP system. The software provisioning manager prompts you for the <SAPSID> when you execute the first installation option to install a new SAP system. 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 <i>SAP System Profile Directory</i> below. ⚠ Caution Choose your SAP system ID carefully. Renaming is difficult and requires you to reinstall the SAP system. 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.
SAP System Profile Directory /sapmnt>/<SAPSID>/ profile or /usr/sap/ <SAPSID>/SYS/ profile	The installation retrieves the parameters entered earlier from the SAP system profile directory. 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. See also the description of the parameter <SAPSID>. ℹ Note /usr/sap/<SAPSID>/SYS/profile is the soft link referring to /sapmnt>/<SAPSID>/profile.

Parameter	Description
Instance Number of the SAP System	Technical identifier that is required for every instance of an SAP system, consisting 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. The instance number specifies the names of the SAP system instance directories that SAP automatically creates during the installation. For example, the directory of the MDS is called MDS<Instance_Number>.
Virtual Host Name	Use one or more virtual TCP/IP host names for SAP servers within an SAP server landscape to conceal their physical network identities from each other. This may be useful when moving SAP servers or complete server landscapes to other new hardware within a short time frame without having to carry out a reinstallation or complicated reconfiguration. To use virtual host names for the installation, specify the virtual host name before you start the software provisioning manager. For more information about the use of virtual TCP/IP host names, see SAP Note 962955. The host name must not exceed 12 characters. For more information about the allowed host name length and characters, see SAP Note 611361.
SAP system mount directory	The SAP system mount directory /<sapmnt> is the base directory for the SAP system. For /<sapmnt> you can use a directory of your choice. If you do not specify a directory, the software provisioning manager creates a directory named sapmnt by default. Do not add <SAPSID> as a subdirectory because the software provisioning manager adds this directory automatically. Note If you enter /sapmount for /<sapmnt> and MDM for <SAPSID> during the input phase of the installation, the software provisioning manager creates the directory /sapmount/MDM. For more information, see File Systems [page 29].
Master Password	This password is used for all new user accounts the software provisioning manager creates. The length must be 8 to 30 characters. Depending on your installation scenario there might be more restrictions. Caution If you do not create the operating system users manually, the software provisioning manager creates them with the common master password. In this case, make sure that the master password meets the requirements of your operating system.

Parameter	Description
User <i><sapsid>adm</i>	User <i><sapsid>adm</i> is the system administrator user. If you did not create user <i><sapsid>adm</i> manually before the installation, the software provisioning manager creates it automatically during the installation. The software provisioning manager sets the master password by default, but you can overwrite it by choosing parameter mode <i>Custom</i> or by changing it on the parameter summary screen. Make sure that the user ID and group ID of this operating system user are unique and the same on each MDM server instance host.
User <i>sapadm</i>	User <i>sapadm</i> is used for central monitoring services. The same notes apply as for user <i><sapsid>adm</i>.
Password of User <i><sapsid>adm</i>	The software provisioning manager processes the passwords of the operating system user as follows: If the operating system user does not exist, SAP creates the user <i><sapsid>adm</i>. This user is the SAP system administrator user and is a member of the local <i>Administrators</i> group. If the operating system user already exists, the software provisioning manager prompts you for the existing password, unless the password of this user is the same as the master password. ⚠ Caution Make sure that you have the required user authorization for this account before you start the installation.
Password of <i>sapadm</i>	The administration user <i>sapadm</i> is created to use central monitoring services. If this user does not already exist, the software provisioning manager automatically creates it. The software provisioning manager prompts you to enter either the password of the existing user or a new password for the user to be created.
Port Number of the MDM server	The TCP/IP port number of the respective MDM server (MDS, MDIS) makes the server accessible through the network. Starting from 7.1 SP4, this parameter is configurable during the MDM installation. 📌 Note We recommend that you use ports higher than 49151. The ports between 0 and 1023 might be used by the operating system and the application may not function correctly. The ports between 1024 and 49151 might be registered for and used by other applications. Check the Internet Assigned Numbers Authority (IANA) registrations with your network administrator.

3.3 Creating Operating System Users and Groups

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

The `sapinst_instdir` directory belongs to a group named `sapinst`. If this group is not available, it is created automatically as a local group.

If you do not want the Software Provisioning Manager to create operating system users, groups, and services automatically, you can optionally create them **before** the installation is started. This might be the case if you use central user management such as Network Information System (NIS).

⚠ Caution

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

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

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

The Software Provisioning Manager checks the NIS users, groups, and services using NIS commands. However, the Software Provisioning Manager does **not** change NIS configurations.

→ Recommendation

If you want to use global accounts that are configured on a separate host, you can do this in one of the following ways:

- You start the Software Provisioning Manager and choose ► [Generic Installation Options](#) ► [<Database>](#) ► [Preparation](#) ► [Operating System Users and Groups](#) ► .
For more information, see [Running Software Provisioning Manager \[page 45\]](#).
- You create operating system users and groups manually. Check the settings for these operating system users.

User Settings

- **Oracle Solaris:** If your operating system is Oracle Solaris 10 or higher, follow the parameter recommendations for SAP applications in SAP Note [724713](#) 📄.
- **AIX:** Make sure that you have set the limits for operating system users as described in SAP Note [323816](#) 📄.
- **Oracle Solaris:** Make sure that you have set the limits listed below for operating system users root, `<sapsid>adm`, and your database-specific operating system users .
Linux: Starting with SUSE Linux Enterprise Server 15, Red Hat Enterprise Linux 8, and Oracle Linux 8, and the respective SAP kernel patch levels, native support for the software suite systemd for Linux is

available for SAP systems. If you use Linux with systemd, ignore the following procedures for setting limits because there's no need to change the limits. Make sure that polkit is installed. systemd requires polkit for authorization checks for the `<sapsid>adm` user. For more information about Linux with systemd, see SAP Note [3139184](#).

If you are still using a Linux version or an SAP kernel patch that is not released for native systemd support with SAP systems (see [3139184](#)), proceed as follows: Make sure that you have set the limits as outlined below for operating system users root, `<sapsid>adm`, and your database-specific operating system users.

⚠ Caution

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

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

🔧 Example

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

Output	Properties
cputime	unlimited
filesize	unlimited
datasize	unlimited
stacksize	8192 KB
coredumpsize	unlimited
descriptors	8192
memoryuse	unlimited

- Using `sh` or `ksh` shell, the output of command `ulimit -a` needs to be at least as follows:

🔧 Example

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

Output sh	Output ksh	Properties
cpu time (seconds)	cpu time (seconds)	unlimited
file size (blocks)	file size (blocks)	unlimited
data seg size (kbytes)	data size (Kibytes)	unlimited

Output sh	Output ksh	Properties
stack size (kbytes)	stack size (Kibytes)	8192 KB
core file size (blocks)	core file size (blocks)	unlimited
open files	nofile	8192
max memory size (kbytes)	max memory size (Kibytes)	unlimited

- All users **must** have identical environment settings. Any change to the environment – such as variables, or paths – is at your own responsibility.
- If you have multiple operating system users with user ID (UID) 0, you must assign the `sapinst` group to all of them.
- Do **not** delete any shell initialization scripts in the home directory of the operating system users. This applies even if you do not intend to use the shells that these scripts are for.
- If you create operating system users manually or use already existing operating system users, make sure that the home directory for each of these users is **not** the root directory (/).
- Make sure that the home directory of user `adm` is not critical for recursive changes on permissions. When operating system users are created by the Software Provisioning Manager, the permissions on the home directories of these users are changed recursively. This can cause unpredictable errors if you define a critical home directory.
For example, the home directory must **not** be / or /usr/sap.

Operating System Users and Groups

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

→ Recommendation

For security reasons, we recommend that you remove the operating system users from the group `sapinst` **after** the Software Provisioning Manager has completed.

We recommend that you specify this “cleanup” already during the [Define Parameters](#) phase on the [Cleanup Operating System Users](#) screen. Then, the removal of the operating system users from the group `sapinst` is done automatically.

Users and Their Groups

User	Primary Group	Additional Group	Description	Login Shell
<code>root</code>	n/a	<code>sapinst</code>	UNIX superuser	n/a
<code><sapsid>adm</code>	<code>sapsys</code>	<code>sapinst</code>	SAP system administrator	Bourne-compatible shell (<code>/bin/sh</code>)*

User	Primary Group	Additional Group	Description	Login Shell
<i>sapadm</i>	<i>sapsys</i>	<i>sapinst</i>	Host Agent administrator	Bourne-compatible shell (<i>/bin/sh</i>)*

3.4 SAP Directories Created During Installation

This section describes the directories that the system creates during the installation of MDM servers .

3.4.1 Physically Shared Directories

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

The software provisioning manager creates the following directories:

- The directory `/<sapmnt>/<SAPSID>` is created on the first installation host. Normally, the first installation host is the host on which the central services instance is to run, but you can also choose another host for `/<sapmnt>/<SAPSID>`. You must manually share this directory with Network File System (NFS) and - for a distributed system - mount it from the other installation hosts.
- The software provisioning manager creates the following shared directories during the SAP system installation:
 - `global`: Contains globally shared data
 - `profile`: Contains the profiles of all instances
 - `exe`: Contains executable kernel programs
 - `<instance>`: Contains instance-specific files like MDM server configuration files (`.ini`), and other directories (accelerators, archives, distributions, reports)

3.4.2 Logically Shared Directories

Logically shared directories reside on the local host(s) with symbolic links to the global host.

The software provisioning manager creates the directory `/usr/sap/<SAPSID>/SYS` on each host. The subdirectories contain symbolic links to the corresponding subdirectories of `/<sapmnt>/<SAPSID>` on the first installation host.

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

3.4.3 Local Directories (SAP System)

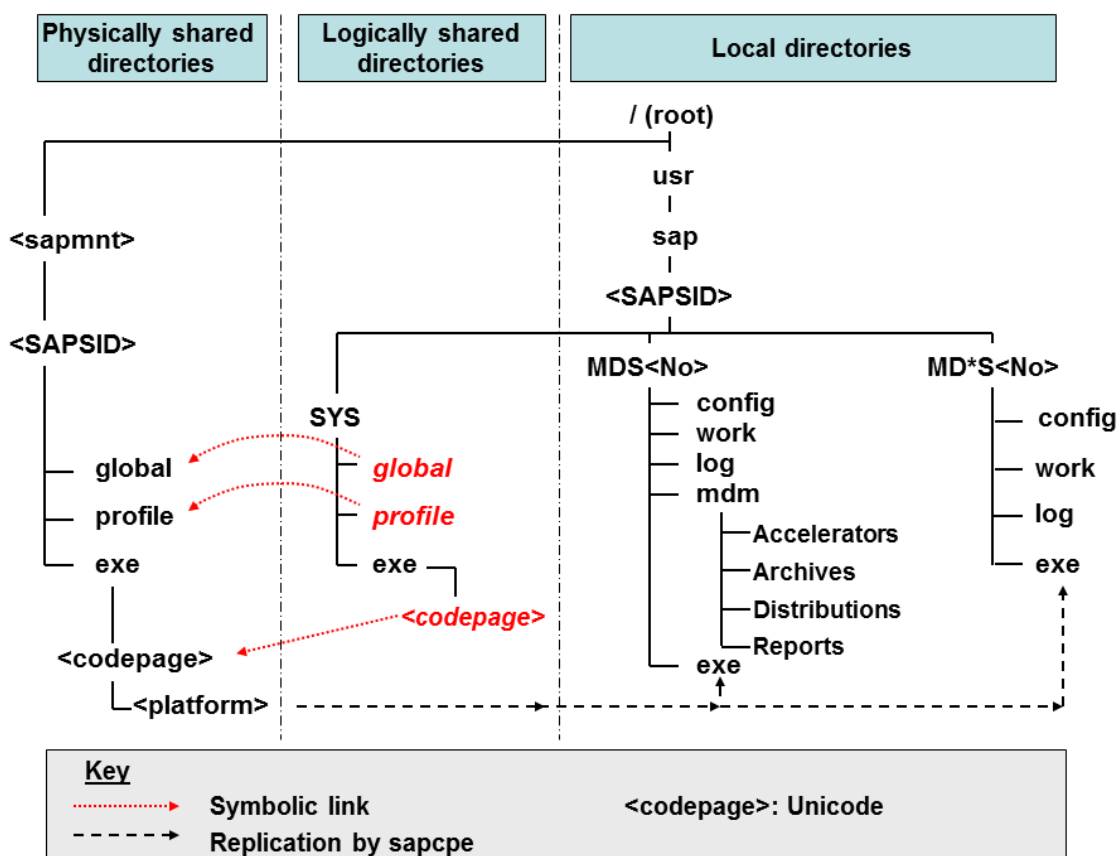
Local directories reside on the local host(s).

The directory `/usr/sap/<SAPSID>` contains files for the operation of a local instance as well as symbolic links to the data for one system.

This directory is physically located on each host in the SAP system and contains the following subdirectories:

- **SYS**
The subdirectories of `/usr/sap/<SAPSID>/SYS` have symbolic links to the corresponding subdirectories of `/<sapmnt>/<SAPSID>`.
- **<INSTANCE>** for each instance installed on the host. The instance-specific directories have the following names:
`MDS<Instance_Number>`
`MDIS<Instance_Number>`

The following graphic shows the directory structure of a distributed UNIX installation:



3.5 File Systems

The following sections describe the directory structures for the SAP system, and how to set up file systems for a distributed installation.

Note

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

3.5.1 Exporting and Mounting Global Directories

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

Prerequisites

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

Context

There is no need to create the directories before the installation when you install a primary application server instance. The global directories must be exported only if you install additional application server instances.

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

Procedure

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

`<sapmnt>/<SAPSID>/exe`

`<sapmnt>/<SAPSID>/profile`

`<sapmnt>/<SAPSID>/global`

Make sure that the user `root` of the host where you want to install the new instance can access the exported directories.

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

```
<sapmnt>/<SAPSID>/exe
```

```
<sapmnt>/<SAPSID>/profile
```

```
<sapmnt>/<SAPSID>/global
```

Caution

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

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

- a. Log on to the SAP global host as user `root` and export the following directories with `root` access to the host on which you want to install the new instance:

```
<sapmnt>/<SAPSID>/exe
```

```
<sapmnt>/<SAPSID>/profile
```

```
<sapmnt>/<SAPSID>/global
```

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

```
<sapmnt>/<SAPSID>/exe
```

```
<sapmnt>/<SAPSID>/profile
```

```
<sapmnt>/<SAPSID>/global
```

Caution

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

Related Information

[Exporting and Mounting Directories via NFS for Linux \[page 32\]](#)

[Exporting and Mounting Directories via NFS for AIX \[page 31\]](#)

[Exporting and Mounting Directories via NFS for Oracle Solaris \[page 33\]](#)

3.5.2 Exporting and Mounting Directories via NFS for AIX

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

Context

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

For a general documentation about NFS on AIX, see:

Network File System (<https://www.ibm.com/docs/en/aix/7.3?topic=management-network-file-system>)

Documentation for basically setting up an NFS server can be found at

Configuring an NFS server (<https://www.ibm.com/docs/en/aix/7.3?topic=system-configuring-nfs-server>)

Documentation for basically setting up an NFS client can be found at

Configuring an NFS client (<https://www.ibm.com/docs/en/aix/7.3?topic=system-configuring-nfs-client>)

Procedure

On the host where you want to export directories (the NFS server) do the following:

1. First of all verify that NFS is running by typing the command:

```
lssrc -g nfs
```

Verify that the `nfsd` and the `rpc.mountd` daemons are reported as active.

If they are not, start NFS using the instructions in [Starting the NFS daemons](#) .

2. Export directories in one of the following ways:

- Variant 1 - using `smit`:

1. Call

```
smit mknfsexp
```

2. Then specify all the necessary values.

When finished, `smit` updates `/etc/exports` and exports the corresponding directory.

- Variant 2 - using text editor and explicit commands:

1. Open the file `/etc/exports` with your favorite text editor.
2. Create an entry for each directory to be exported.
3. Save and close the `/etc/exports` file.
4. Export the directory(s) with:

```
/usr/sbin/exportfs -a
```

On the host (the NFS client) where you want to mount the directories you exported in the previous step, do the following

3. Verify that the NFS server has exported the directory with:

showmount -e ServerName

4. Create a local mount point with:

mkdir /local/directory

5. Mount the NFS directory to that local mount point:

mount ServerName:/remote/directory /local/directory

6. To persist the NFS mount (that means automatically mount it when the system is started), call:

smit mknfsmnt

Enter or change the appropriate values.

Note

Not all values are required.

When finished, **smit** mounts the NFS directory.

You can check that the NFS filesystem is mounted with:

df -g /local/directory

3.5.3 Exporting and Mounting Directories via NFS for Linux

To export directories via NFS, perform the following steps.

Context

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

Procedure

- To export and mount directories via NFS, consult the documentation of your Linux vendor.

3.5.4 Exporting and Mounting Directories via NFS for Oracle Solaris

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

Context

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

Procedure

- On the host on which the directory to be mounted resides:
 - a. Enter the following command:
 - b. To add file systems shared via NFS, edit file `/etc/dfs/dfstab`:

```
/usr/sbin/share
```

```
vi /etc/dfs/dfstab
```

Add the following line for each file system:

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

Note

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

Caution

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

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

- c. If the `/etc/dfs/dfstab` was empty, the NFS server is not active.
 - On Solaris 10 or higher, start the NFS server with the following command:
svcadm enable svc:/network/nfs/server:default
 - On Solaris 11 or higher, you can alternatively use the local ZFS (Zettabyte) file system.
- d. To see if the NFS server is active and which partitions are mountable, enter the command:

```
showmount -e <NFS-server>
```

- On the host on which the additional instance runs:
 - a. If you are mounting NFS disks for the first time, the NFS client software is not active.
 - On Solaris 10, start the NFS server with the following command:
svcadm enable svc:/network/nfs/client:default
 - On Solaris 11 or higher, you can alternatively use the local ZFS (Zettabyte) file system. For more information, see the [Oracle Solaris documentation](#) .
 - b. Edit the file `/etc/vfstab` to mount the directory:

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

vi /etc/vfstab

Add the following line for each file system:

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

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

```
mount <mount point>
```

3.5.4.1 Exporting and Mounting Directories on the Main Instance Host

Context

To mount directories via NFS from the host where the required directory resides, log on as user `root` and proceed as follows.

Procedure

1. Enter the command: **/usr/sbin/share**
2. To add file systems shared via NFS, edit file `/etc/dfs/dfstab`: **vi /etc/dfs/dfstab**. Add the following line for each file system:

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

Note

Depending on your configuration, a fully qualified name might be required for `nfsclient`, for example, `myclient.mydomain.com`.

⚠ Caution

After your SAP system has been installed successfully, in the above line you have to change `-o root` to `-o rw` (or remove `anon=0`) for all exported directories: `share -F nfs -o rw=<nfsclient1>:<nfsclient2> \ -d "description" <file_system_to_be_shared>`

3. If the `/etc/dfs/dfstab` was empty, the NFS server is not active. Start the NFS server with the following command: `svcadm enable svc:/network/nfs/server:default`
4. To see if the NFS server is active and which partitions are mountable, enter the command: `showmount -e <NFS-server>`

3.5.4.2 Exporting and Mounting Directories on the Additional Instance Host

Context

To mount directories via NFS from the host where additional instances run, log on as user `root` and proceed as follows.

Procedure

1. If you are mounting NFS disks for the first time, the NFS client software is not active. Start the NFS client software with the command `svcadm enable svc:/network/nfs/client:default`
2. Edit the file `/etc/vfstab` to mount the directory: `vi /etc/vfstab`.
3. Add the following line for each file system:
`<host_name_where_directory_resides>:<file_system_to_be_shared> \ - <mount point>
nfs - yes -`
If the mount point exists, mount `<file_system_to_be_shared>` with the command `mount <mount point>`

3.6 Preparing the Installation Files

Context

This section describes how to prepare the installation files.

Note

For more information about the installation, see [2367941](#) .

For the installation you will require:

- Download the Software Provisioning Manager Archive from SAP Service Marketplace (SMP).
- MDM installation files.

The MDM installation files can be obtained from one of the following:

- Download the installation files from SAP Service Marketplace (SMP).
- An MDM installation DVD, which is a part of the installation package.

Procedure

To prepare the installation files:

1. Create a download directory on the host on which you are installing MDM.
2. Download to the download directory all the objects required for the type of MDM installation you want to perform.
3. Extract the individual download objects directly into the download directory. During the extraction, the structure of the installation DVD is set up in the download directory.

Related Information

[Downloading Installation Files \[page 39\]](#)

[Obtaining Installation Files from DVD \[page 40\]](#)

3.6.1 Downloading and Extracting the Software Provisioning Manager 1.0 Archive

This section describes how to make the Software Provisioning Manager 1.0 available.

Prerequisites

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.

- Make sure that you are logged on as a user with **root** authorizations, and that the download directory has at least the permissions 755.
- 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 life-cycle 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://me.sap.com/softwarecenter>   **SUPPORT PACKAGES & PATCHES**  **By Category**  **SAP TECHNOLOGY COMPONENTS**  **SAPCAR** .
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://me.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](#) .

Procedure

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

<https://support.sap.com/sltoolset>   **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://me.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 sapcryptolib_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 -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:

```
/<Path to SAPCAR>/SAPCAR -xvf <Path to Download Directory>/  
SWPM10SP<Support_Package_Number>_<Version_Number>.SAR -R <Path to Unpack  
Directory>
```

Note

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

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.

3.6.2 Downloading Installation Files

Context

You can download installation files from the SAP Software Download Center at <https://support.sap.com/swdc>. The SAP Software Download Center enables you to download individual components one by one, or download an entire stack of components at once, by using one of the following options:

- **Entry by Component:** Used to download individual components one by one. You select the target operating system for the component, and then you select the items to download. Typically, you select the latest patch of the latest service pack (SP). You repeat this process for any additional components.
- **Link to SP Stack Application:** Used to download all the components necessary for moving to a higher SP than the one currently installed. After selecting the target SP, you select for each component the instantiation, by defining the target operating system, database, or other required information.

Note

The signature of installation archives is checked **automatically** by the [software provisioning manager \[page 45\]](#) during the *Define Parameters* phase while processing the *Software Package Browser* screens. As of now the software provisioning manager only accepts archives whose signature has been checked.

After scanning the archives and verifying the signature, an info file is written where you can find detailed information about matching and non matching archive files. You can access this info file by choosing the *info file* link in the Archive Scanning Result section of the *Software Package Browser* screen. The info file contains only the results of the latest archive scan.

Procedure

To download a single MDM component from the SAP Software Download Center (swdc):

1. Select the component to download: <https://launchpad.support.sap.com/#/softwarecenter> ► *Support Packages and Patches* ► *By Category* ► *SAP NetWeaver and complementary products* ► *SAP MDM* ► *SAP NETWEAVER MDM 7.1* ► *Entry by Component* ► *<component>* ►

Note

As of SP17 MDM uses the software provisioning manager instead of MDM IM. Make sure that you are using the latest version of the software provisioning manager (MDM is supported as of software provisioning manager SP18). Please see [2367941](#) for the installation manager instructions.

2. When you select a server component:
 - a. Verify that you are using the latest version of the software provisioning manager (MDM is supported as of software provisioning manager SP18).

- b. Verify that the version of the installed MDM Shared Install Content corresponds to the version of the server component. This will also be checked by the software provisioning manager during the installation.
3. Select the installable software unit.
4. Select the target operating system.
5. Scroll down to view the [Downloads](#) tab, and select the items to download.

3.6.3 Obtaining Installation Files from DVD

Procedure

1. Identify the required files for your MDM server installation from the following list.

Option	Description
Central Installation	• Software Provisioning Manager 1.0 Archive • Master Data Server Installation Package: <code>mdm-server-<build>-<UNIX platform>.<archive file extension></code> • Master Data Import Server Installation Package: <code>mdm-import-server-<build>-<UNIX platform>.<archive file extension></code> • Shared Installation Content Package: <code>mdm-shared-<build>-<UNIX platform>.<archive file extension></code> Note On DVD, the above MDM components reside unpacked in the <code>Server_Installation</code> directory.
Distributed Installation of Master Data Server	• Software Provisioning Manager 1.0 Archive • Master Data Server Installation Package: <code>mdm-server-<build>-<UNIX platform>.<archive file extension></code> • MDM Shared Installation Content Package: <code>mdm-shared-<build>-<UNIX platform>.<archive file extension></code>
Distributed Installation of Master Data Import Server	• Software Provisioning Manager 1.0 Archive • Master Data Import Server Installation Package: <code>mdm-import-server-<build>-<UNIX platform>.<archive file extension></code>

Option	Description
	MDM Shared Installation Content Package: <code>mdm-shared-<build>-<UNIX platform>.<archive file extension></code>

2. Make the required installation media available on each installation host.

Caution

If you copy the DVD to disk, make sure that the paths to the destination location of the copied DVD do not contain any blanks. Mount the DVD locally. We do not recommend the use of Network File System (NFS), because reading from DVD mounted with NFS might fail.

4 Installation of MDM Servers

This section describes how to install the following components:

- MDM servers (MDS, MDIS) using the software provisioning manager.
- Additional MDM Components using deployment tools for the respective platforms
- A database using the database-specific installation routine

For installation of MDM Layout Server and MDM Windows clients, see *MDM Installation Guide for Windows* at help.sap.com/nwmdm71.

Note

The administration command line tool MDM CLIX is automatically installed with MDS. You only need install it manually for remote access to MDS, for example from a local Windows PC. For more information see *MDM Installation Guide for Windows*, section *Installing MDM Windows Clients* at help.sap.com/nwmdm71.

4.1 Prerequisites for Running Software Provisioning Manager

Make sure you meet 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 EdgeAlways 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 \[page 45\]](#) . 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 \[page 51\]](#).

- The SAPinst framework of Software Provisioning Manager checks certificates for the Software Provisioning Manager, archives and media and therefore uses a certificate revocation list (CRL). Make sure that this CRL is available. For more information, see SAP Note [3207613](#).
- The Software Provisioning Manager uses shell scripts to obtain the environment for user `adm`.
 - If user `adm` does not yet exist, a working `/bin/csh` must be available on the host where you run the Software Provisioning Manager. For more information about recommended login shells, see SAP Note [202227](#).
 - If user `adm` already exists and uses `csh`, before you start the Software Provisioning Manager, execute the following command as user `adm` to make sure that the `csh` scripts are up-to-date, depending on your UNIX OS platform:

```
/bin/csh -c "source /home/adm/.cshrc;env" or /bin/csh -c "source /home/adm/.login;env"
```
- Make sure that your operating system does not delete the contents of the temporary directory `/tmp` or the contents of the directories to which the variables `TEMP`, `TMP`, or `TMPDIR` point, for example by using a `crontab` entry.
Make sure that the temporary directory has the permissions `755`.
- Make sure that you have at least 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. If you cannot provide 700 MB free space in the temporary directory, you can set one of the environment variables `TEMP`, `TMP`, or `TMPDIR` to another directory with 700 MB free space for the Software Provisioning Manager executables.
You can set values for the `TEMP`, `TMP`, or `TMPDIR` environment variable to an alternative installation directory as described in section [Useful Information about Software Provisioning Manager \[page 51\]](#).
- Make sure that `umask` is set to `022` for the user with `root` permissions that you want to use for running the Software Provisioning Manager.
As the user with `root` permissions that you want to use for running the Software Provisioning Manager, enter the following command: `umask 022`
- **AIX:** Make sure that you have set the limits for operating system users as described in SAP Note [323816](#).
- **Linux:** On Linux, starting with SLES 15, RHEL 8 and Oracle Linux 8, and respective recent SAP kernel patch levels, there is native integration into `systemd`. In this case, limits for operating system users `root`, `<sapsid>adm`, and your database-specific operating system users do not need to be set any longer. Make sure that `polkit` is installed. `systemd` requires `polkit` for authorization checks for the `<sapsid>adm` user. For older Linux versions and SAP kernel patch levels, however, you must still set these limits. For more information about how to proceed for older Linux versions, see the following instructions. For more information about Linux with `systemd` and the relevant SAP kernel patch levels, see SAP Note [3139184](#).
Oracle-Solaris, Linux (versions lower than SLES 15, RHEL 8 and Oracle Linux 8 or lower SAP kernel patch levels): Make sure that you have set the limits for operating system users `root`, `<sapsid>adm`, and your database-specific operating system users (see also sections [Creating Operating System Users and Groups \[page 24\]](#) and [Running Software Provisioning Manager \[page 45\]](#)).

⚠ Caution

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

- Using `cs` shell, the output of command `limit` needs to be at least as follows:

❧ Example

The following table lists example output taken from SUSE Linux Enterprise Server 15 (x86_64).

Output	Properties
cpulimit	unlimited
filesizelimit	unlimited
datasizelimit	unlimited
stacksizelimit	8192 KB
coredumpsize	unlimited
descriptors	8192
memoryuse	unlimited

- Using `sh` or `ksh` shell, the output of command `ulimit -a` needs to be at least as follows:

❧ Example

The following table lists example output taken from SUSE Linux Enterprise Server 15 (x86_64).

Output sh	Output ksh	Properties
cpu time (seconds)	cpu time (seconds)	unlimited
file size (blocks)	file size (blocks)	unlimited
data seg size (kbytes)	data size (Kibytes)	unlimited
stack size (kbytes)	stack size (Kibytes)	8192 KB
core file size (blocks)	core file size (blocks)	unlimited
open files	nofile	8192
max memory size (kbytes)	max memory size (Kibytes)	unlimited

- 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` 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` with the following command line parameter:
`SAPINST_HTTP_PORT=<Free Port Number>`

4.2 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 \[page 42\]](#).

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 \[page 51\]](#).

Procedure

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

⚠ Caution

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

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

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

<Path_To_Unpack_Directory>/sapinst

Note

<Path_To_Unpack_Directory>/sapinst SAPINST_USE_HOSTNAME=<Virtual_Host_Name>

3. The Software Provisioning Manager now starts and waits for the connection with the SL-UI.

You can find the URL you require to access the SL-UI at the bottom of the shell from which you are running the Software Provisioning Manager.

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

Note

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

1. Terminate the Software Provisioning Manager as described in [Useful Information about Software Provisioning Manager \[page 51\]](#).
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.

If you have a supported web browser (see [Prerequisites for Running Software Provisioning Manager \[page 42\]](#)) installed on the host where you run the Software Provisioning Manager, you can open this URL directly in the shell. Otherwise, open the URL in a supported web browser that runs on another device.

Caution

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

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

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

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

`<User_Home>/sapinst/`

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

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

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

The SL-UI opens in the browser by displaying the [Welcome](#) screen.

4. On the [Welcome](#) screen, choose the required option:

Note

Since SAP MDM 7.1 reached end of mainstream maintenance, change to the [Product Versions Out of Mainstream Maintenance](#) directory to access the installation options available for SAP MDM 7.1:

- Install an SAP MDM 7.1 system:
 - To install an SAP MDM 7.1 standard system, choose ► [SAP MDM 7.1 \(out of mainstream maintenance\)](#) ► [Standard System](#) ►.
 - To install an SAP MDM 7.1 distributed system, choose ► [SAP MDM 7.1 \(out of mainstream maintenance\)](#) ► [Distributed System](#) ►.
 - To install an SAP MDMD 7.1 high-availability system, choose ► [SAP MDM 7.1 \(out of mainstream maintenance\)](#) ► [High-Availability System](#) ►.
- Perform software life-cycle options
To perform other software life-cycle options for SAP MDM 7.1, such as configurations, updates, or uninstall, go to ► [SAP MDM 7.1 \(out of mainstream maintenance\)](#) ► [Software Life-Cycle Options](#) ►.

5. Choose [Next](#).

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.

6. Follow the instructions on the Software Provisioning Manager screens and enter the required parameters.

Note

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

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.

7. 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*.

8. If required, delete directories with the name `sapinst_exe.xxxxxx.xxxx` after the Software Provisioning Manager has finished. Sometimes these directories remain in the temporary directory.
9. If you copied the Software Provisioning Manager software to your hard disk, you can delete these files when the installation has successfully completed.
10. For security reasons, we recommend that you remove the operating system users from the group `sapinst` **after** you have completed the installation.

ⓘ Note

This step is only required, if you did **not** specify during the *Define Parameters* phase that the operating system users are to be removed from the group `sapinst` **after** the execution of the Software Provisioning Manager has completed.

11. 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:

`<User_Home>/ .sapinst/`

12. 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_inst_dir` directory. For more information, see [Useful Information about Software Provisioning Manager \[page 51\]](#).

4.2.1 Software Provisioning Manager Installation Options

This section provides information about the installation options and software life-cycle options in the software provisioning manager.

ⓘ Note

To use global accounts that are configured on separate hosts, run the installation option *Operating System Users and Groups* before you start the installation of the SAP system (see Additional Software Life-Cycle Options in the table below).

Standard System:

Installation Option	Description
Standard System	Creates a new SAP system for MDM with the following MDM server instances on a single host: • Master Data Server (MDS) • Master Data Import Server (MDIS) • Master Data Syndication Server (MDSS)
Standard System for SRM-MDM Catalog	Creates a new SAP system for MDM with the following MDM server instances on a single host: • Master Data Server (MDS) • Master Data Import Server (MDIS)

Distributed System:

For a distributed installation, you need to run the Software Provisioning Manager on each host on which you want to install single instances of SAP MDM 7.1 and choose the type of instance. The first instance must be a Master Data Server (MDS). This is the leading instance of your SAP MDM 7.1 system.

Installation Option	Description
Master Data Server (MDS)	Installs an MDS instance Creates a new SAP system for MDM and installs one MDS instance. This will be the leading instance of your MDM system.
Additional Master Data Server (MDS)	Adds a new MDS instance to an existing MDM-specific SAP system
Additional Master Data Import Server (MDIS)	Adds a new MDIS instance to an existing MDM-specific SAP system.
Additional Master Data Syndication Server (MDSS)	Adds a new MDSS instance to an existing MDM-specific SAP system
Additional Master Data Layout Server (MDLS)	Adds a new MDLS instance to an existing MDM-specific SAP system

High-Availability System

Installation of SAP MDM 7.1 for a high-availability scenario

Mandatory instances are distributed on separate hosts.

For more information on High Availability, see the [High-Availability](#) page.

Installation Option	Description
MDM First Cluster Node	Performs the followings steps: • Installs the ABAP central services instance (ASCS instance) and prepares this host as the SAP global host • Installs the enqueue replication server instance (ERS instance) for the ASCS instance • Installs the SAP Host Agent • Creates the SAP cluster group on the first cluster node and adds the ASCS instance to the SAP cluster group You must install the ASCS instance on a shared disk, and all other instances on a local disk.
Additional MDM Cluster Node	Performs the followings steps: • Configures the additional cluster node to run the SAP cluster group • Installs the enqueue replication server instances (ERS instances) - one for the ASCS instance and one for the SCS instance • Installs the SAP Host Agent You must install the ERS instance and the SAP Host Agent on a local disk.

Software Life-Cycle Options:

Installation Option	Description
Configuration for SAP Search and Classification (TREX)	Configures MDS for a connection to TREX.
Configuration for System Landscape Directory (SLD)	Prepares MDM server instances for SLD registration in SAP Process Integration (PI) 7.11 More information: • help.sap.com/nwmdm71 > Monitoring and Supportability: How-To Guides (ZIP) > MDM 7.1 How To Register MDM in SLD (PDF) • help.sap.com/nwmdm71 > Scenario Configuration Guide > Setting Up PI
CCMS Agent and MDM CCMS Plugin including Configuration	Installs the SAP CCMS Agent with the MDM CCMS plug-in and registers the agent in a central monitoring system. More information: help.sap.com/nwmdm71 > Monitoring and Supportability: How-To Guides (ZIP) > How To Install and Configure MDM 7.1 CCMS Monitoring on Windows and UNIX (PDF)

Installation Option	Description
Update MDM	Updates all MDM instances of an SAP system. Use this option to implement patches and support packages for MDM servers.
Uninstall MDM	Uninstalls all MDM instances and deletes the SAP system.

Related Information

[Installing Additional MDM Components \[page 59\]](#)

[Updating MDM Servers \[page 99\]](#)

4.3 Additional Information About Software Provisioning Manager

4.3.1 Useful Information about Software Provisioning Manager

This section contains some useful technical background information about the Software Provisioning Manager and the 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 user interface technology for the user are:
 - Zero foot print, since only a web browser is required on the client
 - Controls and functionality, for example, view logs in web browser.

As of version 1.0 SP24 Patch Level 5, the Software Provisioning Manager has an updated 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 at the bottom of the shell from which you are running the Software Provisioning Manager . If you have a supported web browser installed on the host where you run the Software Provisioning Manager, you can start the SL-UI directly

from this URL. Otherwise, open a web browser supported by the SL-UI on any device and run the URL from there.

For more information about supported web browsers see [Prerequisites for Running Software Provisioning Manager \[page 42\]](#).

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` executable, the Software Provisioning Manager creates a `.sapinst` directory underneath the `/home/<User>` directory where it keeps its log files. `<User>` is the user with which you have started the 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 log files, and which is located directly below the temporary directory. The Software Provisioning Manager finds the temporary directory by checking the value of the `TEMP`, `TMP`, or `TMPDIR` environment variable. If no value is set for these variables, the Software Provisioning Manager uses `/tmp` by **default**.
All log files which have been stored so far in the `.sapinst` folder are moved to the `sapinst_instdir` directory as soon as the latter has been created.
If you want the `sapinst_instdir` directory to be created in another directory than `/tmp`, set the environment variable `TEMP`, `TMP`, or `TMPDIR` to this directory before you start the Software Provisioning Manager.

Shell Used	Command
Bourne shell (sh)	<code>TEMP=<Directory></code> <code>export TEMP</code>
C shell (csh)	<code>setenv TEMP <Directory></code>
Korn shell (ksh)	<code>export TEMP=<Directory></code>

⚠ Caution

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

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 the temporary directory. These executables are deleted again after the Software Provisioning Manager has stopped running.

Directories called `sapinst_exe.xxxxxx.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 `FC0-00058`.

- To see a list of all available Software Provisioning Manager properties (command line options) and related documentation, start the Software Provisioning Manager as described above with command line parameter **-p**:
`./sapinst -p`
- If required, stop the Software Provisioning Manager by choosing the *Cancel* button.

ℹ Note

If you need to terminate the Software Provisioning Manager, press `Ctrl` + `C`.

4.3.2 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 terminate in error situations. If an error occurs, processing is paused 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 **processed** by this option is incomplete and not ready to be used. Any system or component **removed** by this option is not completely removed.

The following table describes the options in the dialog box:

Option	Definition
Retry	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 Retry. If the same or a different error occurs, the Software Provisioning Manager displays the same dialog box again.
Stop	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.
Continue	The Software Provisioning Manager continues the installation from the current point.
View Log	Access installation log files.

❗ Note

You can also terminate the Software Provisioning Manager by choosing `Ctrl + C` but we do **not** recommend this because it kills the process immediately.

The following procedure describes the steps to restart an installation, which you stopped by choosing [Stop](#), or to continue an interrupted installation after an error situation.

Procedure

1. Log on to the host where Software Provisioning Manager is running as a user with the required permissions as described in [Running Software Provisioning Manager \[page 45\]](#).
2. Make sure that the installation media are still available.

For more information, see [Preparing the Installation Files \[page 36\]](#).

→ Recommendation

Make the 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.

❗ Note

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

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

<Path_To_Unpack_Directory>/sapinst

4. The Software Provisioning Manager is restarting.

You can find the URL you require to access the SL-UI at the bottom of the shell from which you are running the Software Provisioning Manager.

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

Note

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

1. Terminate the Software Provisioning Manager as described in [Useful Information about Software Provisioning Manager \[page 51\]](#).
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.

If you have a supported web browser (see [Prerequisites for Running Software Provisioning Manager \[page 42\]](#)) installed on the host where you run the Software Provisioning Manager, you can open this URL directly in the shell. Otherwise, open the URL in a supported web browser that runs on another device.

Caution

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

Before you reach the [Welcome](#) screen, your browser warns you that the certificate of the **sapinst** process on this computer could not be verified.

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

1. Click on the certificate area on the left hand side in the address bar of your browser, and view the certificate.
2. Open the certificate fingerprint or thumbprint, and compare all hexadecimal numbers to the ones displayed in the console output of the 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:
<User_Home>/sapinst/
 2. In the **sapinst_exe.xxxxxx.xxxx** directory, execute the **sapgenpse** tool with the command line option **get_my_name -p**.

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

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

The SL-UI opens in the browser by displaying the [Welcome](#) screen.

5. From the tree structure on the [Welcome](#) screen, select the installation option that you want to continue and choose [Next](#).

The [What do you want to do?](#) screen appears.

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

Alternative	Behavior
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: <pre>log_<Day>_<Month>_<Year>_<Hours>_<Minutes>_<Seconds></pre> ♣ Example <pre>log_01_Oct_2016_13_47_56</pre> 📘 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.

4.3.3 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.

📘 Note

Only use the `Step State Editor` if the SAP Support requests you to do so, for example to resolve a case in [SAP for Me](#).

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 \[page 42\]](#).

Procedure

1. Start the Software Provisioning Manager from the command line as described in [Running Software Provisioning Manager \[page 45\]](#) 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.

4.3.4 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.

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 them in the `.sapinst` directory underneath the `/home/<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 \[page 51\]](#).

- To check the log and trace files of the Software Provisioning Manager's SL-UI for errors, go to the directory `<User_Home>/ .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 \[page 53\]](#).
3. If you cannot resolve the problem, report a case in [SAP for Me](#) using the appropriate subcomponent of BC-INS*.

For more information about using subcomponents of BC-INS*, see SAP Note [1669327](#).

5 Installing Additional MDM Components

Component		
[Shipped Files]	Prerequisites / Remarks	Installation Procedure
MDM Java API and MDM Connector	For hosted applications, you need SAP NetWeaver 2004 or 7.0. For standalone applications, you need a Java 1.4.2 compatible Java Virtual Machine.	Deploy the components on your Java machine. For more information, see <i>MDM Java API Guide</i> at help.sap.com/nwmdm71 .
MDM ABAP API	An ABAP system is installed.	Deploy components on your ABAP system as SAP Add-On. For more information, see <i>MDM ABAP API</i> and the application help of transaction SAINT at help.sap.com/nwmdm71 .
MDM Portal Content	MDM Connector and MDM Java API are deployed (see above).	Deploy the components on your EP. For more information, see <i>Business Package for Master Data Management in the Portal Content for MDM</i> at help.sap.com/nwmdm71 .

6 Installing and Configuring the Database

Before the MDS can handle data, you must install and configure the database.

⚠ Caution

After stopping MDS and the database, restart the database first.

Starting from MDM 7.1 SP06, the installation for Windows asks you which database server[s] will be used by MDM. Then, for each server, the installation searches for the database client and does not continue if the database client is not found on the server.

Note the following when planning the MDS and database combination:

- Make sure that your operating system meets the prerequisites for the database you want to run, including any necessary service packs, hot fixes, libraries, or DLLs. For more information, see the OS and DB documentation.
- DBMS client software must be installed on the machine that runs the MDS. Make sure that the MDM user [SAPService<SID>](#) has the necessary rights for accessing the database client.
- HANA (MDM-SRM only): An additional user has to be created with the authorizations below:
 - The predefined role [RESTRICTED_USER_ODBC_ACCESS](#).
 - System privilege [CREATE SCHEMA](#).

📘 Note

If you were using the user [SYSTEM](#) and you want to change the user, then follow the steps in SAP Note [3036256](#).

- Make sure that the MDM user [<sapsid>adm](#) has the necessary rights for accessing the database client.

📘 Note

Check if the user [<sapsid>adm](#) is a member of the user group that the system creates for the database clients during their installation. This user group owns the client files on file system level (for example user group [dba](#) for Oracle client library). The software provisioning manager does not add the user automatically. If the MDM user is not member of the group, add it manually as follows:

1. Log in as the [<sapsid>adm](#) user.
2. Stop the MDS instance and the instance service using the following commands:

```
sapcontrol -nr <number of MDS instance> -function Stop  
sapcontrol -nr <number of MDS instance> -function StopService
```

3. Add the user [<sapsid>adm](#) to the user group that owns the database client files.
4. Start the instance service and the MDS instance again using the following commands:

```
sapcontrol -nr <number of MDS instance> -function StartService <SAPSID>  
sapcontrol -nr <number of MDS instance> -function Start
```

6.1 Oracle DBMS

❗ Note

You can use Oracle 12 with MDM 7.1 only if it is supported by your OS and platform setup. We recommend that you verify platform support by running `sqlplus` to connect to the database.

Install Oracle and Create a Database Instance

- Install both DBMS and client of Oracle if you plan to host Oracle on the same machine as MDS. If the DBMS and MDM reside on different hosts, the MDS host requires the installation of the Oracle client.

❗ Note

When installing the Oracle Database, in the step where you select the installation option, make sure you select *Create and configure database* (and not *Install database software only*).

- If MDS and the Oracle DB are running on the same host, set `LD_LIBRARY_PATH` (LIBPATH for AIX) directly to the Oracle library directory.
- If MDS runs on a machine where only the Oracle instant client software is installed, make sure that:
 - The `libcintsh.a` library is present on AIX
- If the MDS and the DBMS are on the same machine, use the Net Configuration Assistant to define a Listener address and local Service Name that uses the IPC protocol rather than TCP. This affects the `listener.ora` and `tnsnames.ora` files, which can also be edited manually. This increases the repository unarchive performance.
- To determine the Oracle client versions that are supported for the various DBMS versions, refer to the Oracle server/client interoperability support matrix.

❗ Note

In earlier versions of Oracle, by default, passwords did not expire. Starting from Oracle 11, the default is that passwords expire in 180 days. Password expiration has a negative impact on MDS. This is due to the fact that during the days before the password expires, warning messages about password expiration interfere with MDS operations.

- Oracle's performance increases when separate spindles (hard disks) are used for the main data and indices. Rollback segments (for transactions and logging) are set at database instance creation time and can represent an opportunity to use three separate spindles. The location of the main and index files can be set before repository creation, unarchiving, or duplication via the Console.
- Make sure that the user account of the SAP system (`<sid>adm`) has the permissions to read the Oracle client libraries. Typically, the client libraries are installed under `$ORACLE_HOME` with permissions 755, allowing read permissions for all. In addition, if the Oracle user account (for example the account used to install the Oracle software) has been assigned to the `dba` group, you may wish to add the SAP system user account to the `dba` group as well.
- The `<Cursor Sharing>` parameter is set on a session basis to be exact. This provides a small performance improvement for certain operations between MDS and the Oracle Server. For earlier versions

of MDM, you can turn this parameter on globally for the entire Oracle instance with the following command:

```
ALTER SYSTEM SET cursor_sharing='EXACT' scope=BOTH
```

- MDM requires particular character sets:
 - National Character Set: Choose a Unicode character set, such as UTF8 or AL16UTF16.
 - Database Character Set: Choose a Unicode character set, such as UTF8 or AL32UTF8.

Caution

Unicode character sets are the only character sets that MDS supports. Do not use an Oracle database instance that has different character sets for MDM. To use an existing database instance, run the following queries to determine the character sets:

- National Character Set:

```
select VALUE from NLS_DATABASE_PARAMETERS where  
PARAMETER= 'NLS_NCHAR_CHARACTERSET '
```
- Database Character Set:

```
select VALUE from NLS_DATABASE_PARAMETERS where  
PARAMETER= 'NLS_CHARACTERSET '
```

If the results of the above queries do not return Unicode character sets, you must create a new database instance for MDM.

- Linux on PowerPC: Set the following environment variable:

```
<export MDS_PRELOAD=libheteroxa10.so  
>
```

For more parameter recommendations for Oracle 10g, see SAP Note [830576](#) .

6.1.1 Setting Up the Database

Context

Procedure

1. To connect to the database, create an entry in the `tnsnames.ora` file. On UNIX OS, it is typically located in `$ORACLE_HOME/network/admin/..`

The entry must use the following format:

```
<net service name specified in the MDM Console as DBMS server> =  
(DESCRIPTION =  
  (ADDRESS_LIST =  
    (ADDRESS = (PROTOCOL = TCP)(HOST = <fully qualified IP address or  
domain of the host machine running the Oracle DBMS>)(PORT=<number of the port  
used by DBMS host with default 1521>))  
  )  
)
```

```
(CONNECT_DATA =
  (SERVICE_NAME = <Oracle service name specified when the Oracle
DBMS was installed>)
)
```

Test the net service name by logging onto the Oracle database from the MDS host using the Oracle SQLPLUS command **sqlplus <userid>/<password>@<net service name>**

Alternatively, test the connection to the Oracle database with the command **tnsping <net service name>**

2. On the MDS host, run the Net Manager to make the DBMS known to Oracle clients. In this case, the MDS is an Oracle client.

6.1.2 Connecting MDS to the Database

Context

Procedure

1. Modify the temporary tablespace.

When connecting to the DBMS for the first time (DBMS initialization), the system account or an equivalent account is used to make the connection and the DBMS is queried for the temporary tablespace of that account. Normally this tablespace is named TEMP. If the site needs to use a different tablespace, modify the temporary tablespace of the connecting account prior to DBMS initialization.

2. Set the user account.

The first time that the MDS connects to the database, the MDM Console asks which user account to use to connect to the DBMS. By default you use the SYSTEM account for all access. To use another account or if the use of the SYSTEM account is not allowed in your DBMS, use the SYSTEM account, or the MDM Console/CLIX feature to create an alternative account. Model your account creation according to the following template:

```
create user HARRY_POTTER identified by muggles default tablespace
SYSTEM;
grant alter user, alter system, create session, create any index,
create view, dba, drop any view, create any table, delete any table,
drop any table, insert any table, update any table, select any table,
alter tablespace, create tablespace, drop tablespace,
unlimited tablespace, create any sequence, drop any sequence, alter any
sequence, select
any sequence, lock any table, alter any table,
alter any type, alter database, create profile, drop profile, create
database link, drop any index, create user, drop user, create any
directory, create any procedure, analyze any to HARRY_POTTER;
```

3. Define the tablespace directories.

The first time that you connect the MDS to the database using MDM Console, a dialog box appears asking you where you want to store data and index tablespace files. These settings apply to repositories only as they are created. Existing repositories stay where they were created.

- a. If you leave these fields blank, MDM creates tablespaces in the default tablespace directory. While this is acceptable in most cases, you may wish to specify other locations on the database host machine. If you choose different locations for the data tablespace and index tablespace so that they are on different hard disks (different physical spindles, not just logical drives), database performance can improve by a small, but significant, degree. The directory paths you specify must already exist on the database host machine.
- b. These settings apply to repositories only as they are created. Existing repositories stay where they were created.
- c. To gain even more detailed control your tablespaces, or to use tablespaces that already exist, see [Allowing Flexible Tablespaces \[page 65\]](#).

Note

After a repository is created through create, unarchive, duplicate or slave operations, all tables and indexes are analyzed in the final step. We recommend that you re-analyze tables to maximize the performance of the DBMS from time to time and especially if your repository has gained or lost a significant number of records (for example from a large import).

4. To mount an MDM repository residing in an Oracle DBMS, specify the Oracle Net Service Name as the DBMS server in the Add DBMS Server dialog. This name should be defined using Oracle networking methodologies.

6.1.3 Adjusting Temporary Tablespace for MCOD

Context

For MCOD (MDM sharing the same database with other SAP components, such as SAP ERP ECC or SAP NetWeaver Application Server), check and adjust the temporary tablespace.

The first time MDS establishes a relationship with a particular Oracle instance, it queries the temporary tablespace name of the initial login, for example SYSTEM. The retrieved value, for example TEMP, is stored in MDM in the A2i_xCat_DBs.A2i_DB_Settings table in the TempTableSpaceName field. MDM queries this table when creating more users or schemas.

In an MCOD environment where the database has been installed with SAP NetWeaver AS Java using the software provisioning manager, the temporary tablespace is set to PSAPTEMP.

Procedure

To adjust the temporary tablespace setting, proceed in one of the following ways:

- In the MDM Console, choose DBMS Settings from context menu of your MDS and set the Temp tablespace name.
- Use the following CLIX command:

```
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> TempTableName=PSAPTEMP
```

6.1.4 Allowing Flexible Tablespaces

You can detach from the methods built into MDM for the creation of Oracle database storage. As an experienced database administrator, you can utilize even more of the flexibility and power that the database provides.

Background

In Oracle, data elements are stored in tables. Collections of tables are grouped together into schemas. Tables (or schemas) are then assigned to logical storage entities called tablespaces. By using the logical concept of a tablespace, Oracle allows you to manage the actual files that are used for a tablespace independent of the schemas and tables.

By default MDM applies the following data storage concept:

- MDM repositories use one, two or four schemas.
MDM data divides into four types of data collections: Main, Originals, Thumbnails, and Variants. In a two partition arrangement, Main and Originals are placed in one partition, with Thumbnails and Variants being placed in the other. With four partitions, each data collection type has a separate partition (schema and tablespaces).

Note

Choosing two or four partitions gives you the option of performing Oracle based backups on a different schedule for the various partitions. Since Thumbnails and Variants can be recreated through MDM, these can be backed up less frequently or not at all. For many use cases, Originals change at a less frequent rate than Main data, so they, too, can be backed up less frequently in a four partition configuration.

- MDM creates two tablespaces for each schema, one for data and the other for indexes. The names of the schemas are derived from the repository name, and in turn the tablespace names are derived from the schema names.
- MDM uses a single directory location on an individual DBMS for all data tablespaces and another single directory for index tablespaces. These two settings are controllable from the MDM Console.

This arrangement is convenient for the majority of use cases; however, it limits the full control of location and other parameters in the creation and management of tablespaces that are possible in Oracle databases. You can create tablespaces according to the requirements of your particular installation as described below.

6.1.4.1 Enhancing Tablespace

MDS can use tablespaces that preexist in a database as an alternative to creating them. The configuration of such a custom tablespace is maintained on the DBMS in the following table:

A2I_XCAT_DBS.A2I_DB_SETTINGS

You must add several rows that are not automatically created through use of the MDM Console or CLIX, by manually using scripts and/or SQL*Plus utility of Oracle. Once these rows are created, they can be maintained using the MDM Console.

The A2I_XCAT_DBS.A2I_DB_SETTINGS table creates the following records:

NAME column	SETTING column	Explanation
DataPath	Actual path or empty	Already exists and managed by MDM Console. A single directory where data tablespaces are created.
IndexPath	Actual path or empty	Already exists and managed by MDM Console. A single directory where index tablespaces are created.
tsname_m	Name of tablespace you created	Tablespace name for main repository schema tables. If this record is missing or the Setting column is blank or empty, the DataPath record is used to create a new tablespace.
tsname_mx	Name of tablespace you created	Tablespace name for main repository schema tables indexes. If this record is missing or the Setting column is blank or empty, the IndexPath record is used to create a new tablespace.
tsname_o	Name of tablespace you created	Tablespace name for originals repository schema tables. If this record is missing or the Setting column is blank or empty, the DataPath record is used to create a new tablespace.
tsname_ox	Name of tablespace you created	Tablespace name for originals repository schema tables indexes. If this record is missing or the Setting column is blank or empty, the IndexPath record will be used to create a new tablespace.

NAME column	SETTING column	Explanation
tsname_t	Name of tablespace you created	Tablespace Name for Thumbnails Repository Schema Tables. If this record is missing or the Setting column is blank or empty, the "DataPath" record will be used to create a new tablespace.
tsname_x	Name of tablespace you created	Tablespace name for thumbnails repository schema tables indexes. If this record is missing or the Setting column is blank or empty, the IndexPath record will be used to create a new tablespace.
tsname_v	Name of tablespace you created	Tablespace name for image variants repository schema tables. If this record is missing or the Setting column is blank or empty, the DataPath record will be used to create a new tablespace.
tsname_vx	Name of tablespace you created	Tablespace name for image variants repository schema tables indexes. If this record is missing or the Setting column is blank or empty, the IndexPath record will be used to create a new tablespace.

To initially create the A2I_XCAT_DBS schema and A2I_DB_SETTINGS table on a DBMS from the MDM Console, choose DBMS Settings from the MDS Server node context menu or from the Server menu. Once created, insert the eight necessary records listed in the table above by using the Oracle Enterprise Manager, or with a script using SQL*Plus.

The following sample script utilizes eight separate tablespaces. The password for the a2i_xcat_dbs account is the same as the one used to initially connect using the DBMS Settings dialog:

```
connect a2i_xcat_dbs/<myPassword>@<myInstance>;
insert into a2i_db_settings (name, setting) values ('tsname_m', 'MMM');
insert into a2i_db_settings (name, setting) values ('tsname_o', 'OOO');
insert into a2i_db_settings (name, setting) values ('tsname_t', 'TTT');
insert into a2i_db_settings (name, setting) values ('tsname_v', 'VVV');
insert into a2i_db_settings (name, setting) values ('tsname_mx', 'MMM_IDX');
insert into a2i_db_settings (name, setting) values ('tsname_ox', 'OOO_IDX');
insert into a2i_db_settings (name, setting) values ('tsname_tx', 'TTT_IDX');
insert into a2i_db_settings (name, setting) values ('tsname_vx', 'VVV_IDX');
commit;
```

You must use the names of the actual, existing tablespace or tablespaces you intend to use prior to actually creating a repository (creating slave, unarchiving, etc). For example, if you were using a single tablespace for all data named MDSDATA and another for all indexes named MDS_IDX, your script would be as follows:

```
connect a2i_xcat_dbs/<myPassword>@<myInstance>;
insert into a2i_db_settings (name, setting) values ('tsname_m', 'MDSDATA');
insert into a2i_db_settings (name, setting) values ('tsname_o', 'MDSDATA');
insert into a2i_db_settings (name, setting) values ('tsname_t', 'MDSDATA');
insert into a2i_db_settings (name, setting) values ('tsname_v', 'MDSDATA');
insert into a2i_db_settings (name, setting) values ('tsname_mx', 'MDS_IDX');
insert into a2i_db_settings (name, setting) values ('tsname_ox', 'MDS_IDX');
insert into a2i_db_settings (name, setting) values ('tsname_tx', 'MDS_IDX');
insert into a2i_db_settings (name, setting) values ('tsname_vx', 'MDS_IDX');
commit;
```

At this point, create a new repository (or unarchive, make a slave, etc.) on that particular DBMS host. After creating this repository, you may want to create another repository with different tablespaces. For example you want to regularly backup the tablespaces for a master repository, but you also want a slave repository on different tablespaces where backups are less necessary.

Prior to creating a slave, in the DBMS Settings dialog in the MDM Console, change the setting values for the tsname_<...> setting names. Alternatively use CLIX or SQLPlus scripts which would look as follows:

- CLIX

```
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_m=SLAVEDATA
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_o=SLAVEDATA
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_t=SLAVEDATA
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_v=SLAVEDATA
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_mx=SLV_IDX
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_ox=SLV_IDX
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_tx=SLV_IDX
clix dbSetDBMSSetting <mdsHostSpec> <dbmsSpec> tsname_vx=SLV_IDX
```

Note

Once the records have been created (as shows above), the CLIX method integrates easily with other CLIX commands such as create slave operations. More information: Documentation of the CLIX commands <mdsHostSpec> and <dbmsSpec> is in the MDM Console Reference Guide at help.sap.com/nwmdm71.

- SQLPlus

```
connect a2i_xcat_dbs/<myPassword>@<myInstance>;
update a2i_db_settings set setting = 'SLAVEDATA' where name = 'tsname_m';
update a2i_db_settings set setting = 'SLAVEDATA' where name = 'tsname_o';
update a2i_db_settings set setting = 'SLAVEDATA' where name = 'tsname_t';
update a2i_db_settings set setting = 'SLAVEDATA' where name = 'tsname_v';
update a2i_db_settings set setting = 'SLV_IDX' where name = 'tsname_mx';
update a2i_db_settings set setting = 'SLV_IDX' where name = 'tsname_ox';
update a2i_db_settings set setting = 'SLV_IDX' where name = 'tsname_tx';
update a2i_db_settings set setting = 'SLV_IDX' where name = 'tsname_vx';
commit;
```

To return this DBMS to the state where MDS automatically creates tablespaces, manually delete these records from the database. This cannot be done from the MDM Console; use the following script:

```
connect a2i_xcat_dbs/<myPassword>@<myInstance>;
delete a2i_db_settings where name like 'tsname_%';
commit;
```

Note

- When you choose this alternate method of tablespace assignment, you must create the tablespaces by yourself. To test what you have done with these assignments, create a new repository by using four partitions and examine the results in report files, or by using the Oracle Enterprise Manager.
- The settings in A2I_XCAT_DBS.A2I_DB_SETTINGS table are queried when MDS performs a duplicate, unarchive, create new, or create slave operation. Afterwards these tablespace settings remain associated with that repository even if you change the settings prior to creating another repository.
- The contents of the NAME column are case-sensitive. Make sure that you use tsname_o and no other spelling.

- Once you have created these eight records in the A2I_DB_SETTINGS table, you can change the setting values using the DBMS Settings dialog of the MDM Console. This dialog does not allow you to add or delete records or change the name of an existing record. To change the name of a record or to delete records, use the Oracle Enterprise Manager or SQL*Plus utilities.
- The History table, which is used for auditing, does not fall under this manual tablespace management approach and still uses the settings for DataPath and IndexPath.
- When you create your own tablespaces, you must monitor their growth and manage the way that the size of the tablespace files is extended

More Sample Scripts

- The following example shows a tablespace definition that is typical for the main data partition of an MDM repository where the tablespace is comprised of two files that can grow indefinitely:

```
CREATE TABLESPACE MDSDATA DATAFILE
  '/usr/db/ts/mdsdata1.dbf' SIZE 1M
  REUSE AUTOEXTEND ON NEXT 1M MAXSIZE UNLIMITED,
  '/usr/db/ts/mdsdata2.dbf' SIZE 1M
  REUSE AUTOEXTEND ON NEXT 1M MAXSIZE UNLIMITED
DEFAULT STORAGE
  (INITIAL 16K NEXT 64K MAXEXTENTS UNLIMITED PCTINCREASE 0);
```

- The following example shows a tablespace definition similar to the previous example, except that the file system limits files to 2 GB and you allocate the entire file space immediately to avoid disk fragmentation:

```
CREATE TABLESPACE MDSDATA DATAFILE
  '/usr/db/ts/mdsdata1.dbf' SIZE 2048M,
  '/usr/db/ts/mdsdata2.dbf' SIZE 2048M
DEFAULT STORAGE
  (INITIAL 16K NEXT 64K MAXEXTENTS UNLIMITED PCTINCREASE 0);
```

- The following example shows a tablespace definition that is typical for an MDM repository index tablespace.

```
CREATE TABLESPACE MDS_IDX DATAFILE
  '/usr/db/ts/mds_idx.dbf' SIZE 128K
  REUSE AUTOEXTEND ON NEXT 64K MAXSIZE UNLIMITED
DEFAULT STORAGE
  (INITIAL 16K NEXT 64K MAXEXTENTS UNLIMITED PCTINCREASE 0);
```

6.2 IBM DB2 for Linux, UNIX, and Windows

See Installing and Setting Up MDM with IBM DB2 for Linux, UNIX, and Windows at help.sap.com/nwmdm71 .

6.3 IBM DB2

The minimum system requirements for an SAP MDM installation are as follows:

- IBM DB2 Driver for ODBC and CLI Version 9 FixPak 1

⚠ Caution

You must use this driver for connectivity between the database and your MDM server.

The following sections describe how to install the CLI driver.

6.3.1 Downloading the Archive

Context

Procedure

1. Create a directory in which to install the CLI driver. In the documentation, this directory is `<db2_cli_odbc_driver>`.
2. Download the CLI driver file:

If you are an SAP OEM customer, you can download the file at

<https://launchpad.support.sap.com/#/softwarecenter>. Go to **Databases** > **Database and Database Patches** > **IBM DB2 (depending on your OS)** > **Select the version DB2 for LUW *** > **INSTALLATION**.

There is no top directory in this archive.

If you are an IBM customer, obtain the file from IBM. In this case, the top directory in the archive is `clidriver`.

3. Extract the file to the directory `<db2_cli_odbc_driver>`

If you downloaded the file from the SAP Service Marketplace, extract it using SAPCAR to `<db2_cli_odbc_driver>`. For more information about SAPCAR, see SAP Note [212876](#).

If you downloaded the file from the IBM site, see the corresponding IBM documentation for information about file extraction.

📌 Note

When you download the file from IBM and extract the file, a subdirectory `clidriver` is created.

6.3.2 Modifying the PATH Variable

Procedure

Add the following DB2 directory to your **<PATH>** environment variable:

- For AIX: Add **<db2_cli_odbc_driver>/lib** to the **<LIBPATH>** variable.
- For Linux: Add **<db2_cli_odbc_driver>/lib** to the **<LD_LIBRARY_PATH>** variable

If a DB2 Connect client is installed on the server, make sure that the CLI Driver is found prior to the DB2 Connect client.

In special cases, you must set the **<DB2_CLI_DRIVER_INSTALL_PATH>** environment variable to **<db2_cli_odbc_driver>**. This environment variable overwrites the library path setting.

6.3.3 Downloading the CLI Driver License

Prerequisites

The CLI Driver comes with a temporary license that expires after 90 days: If a permanent license is already available, copy it to the license directory, **<db2_cli_odbc_driver>/license**, to avoid unnecessary downtime later on.

Context

On UNIX, the user **<SIDADM>adm** must have permission to read and write to the license file directory of the IBM clidriver: **<cli_driver_path>/clidriver/license**

Procedure

Depending on the way you purchase DB2 Connect, download the permanent license file for the IBM DB2 Driver for ODBC and CLI:

- For SAP OEM Customers: If you purchase DB2 and DB2 Connect from SAP as an OEM customer, go to <https://launchpad.support.sap.com/#/softwarecenter>. Go to **Databases** > **Database and Database Patches** > **IBM DB2 (depending on your OS)** > **Select the version DB2 for LUW * SAP OEM license (Note 816773)**. The site with the license file is only accessible for OEM customers.

- For IBM Customers: If you purchase DB2 and DB2 Connect from IBM, do the following: Retrieve the permanent license file for the IBM DB2 Driver for ODBC and CLI from the DB2 Connect image that you receive from IBM. Depending on your edition of DB2 Connect (Enterprise Edition, Unlimited Server Edition), the name of the license file varies.

ⓘ Note

In the Enterprise Edition, the license file is called `db2consv_ee.lic`.

6.3.4 Configuring db2cli.ini

This file is located in directory `<db2_cli_odbc_driver>\cfg\db2cli.ini`.

[<DBALIAS>]

DATABASE=<LOCATION NAME>

PROTOCOL=TCPIP

HOSTNAME=<HOSTNAME>

SERVICENAME=<DDFPORT>

Where:

- `<DBALIAS>` is the logical name of the database under which the database is known to the MDM Console.

ⓘ Note

You must specify the `<DBALIAS>` within the MDM Console when you specify the DB2 for z/OS data source for your archives.

- `<LOCATION NAME>` is the DDF Location name of the DB2 Subsystem
- `<HOSTNAME>` is the name of the database host
- `<DDFPORT>` is the DDF listening port of the DB2 Subsystem

The DB2 command `-DISPLAY DDF` displays the DDF Port as `TCPPORT` and the DDF Location Name as `LOCATION`.

6.3.5 Setting Up DB2

The DB2 z/OS setup is the same for SAP NetWeaver and SAP NetWeaver MDM. For more information about the DB2 z/OS setup, see the *SAP Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows* at help.sap.com.

ⓘ Note

You must install the stored procedure `DSNUTILS` according to the instructions in the SAP DBA Guide for z/OS.

6.3.6 Performing BIND and GRANT

⚠ Caution

For the most recent information about BIND and GRANT with MDM, see SAP Note [1119041](#).

6.3.6.1 BIND and GRANT with SAP NetWeaver AS Java

You do not need SAP NetWeaver AS Java to install MDM. However, if SAP NetWeaver AS Java is installed, you can use the following procedure to BIND and GRANT:

First, call the DBA Cockpit (or transaction DB2) on your SAP Solution Manager system and perform these steps remotely for the MDM system.

For general information about the Solution Manager, see the SAP Solution Manager documentation at https://help.sap.com/docs/SAP_Solution_Manager.

The procedure for performing the BIND and GRANT steps depends on the version of your SAP NetWeaver AS Java.

📘 Note

Before you begin, check that the user who is installing MDM and the MDM user generated during the installation process have the correct permissions for BIND and GRANT. For details on permissions, see the *Security Guide for DB2 for z/OS* at https://help.sap.com/viewer/db2_security_guide.

SAP Solution Manager 4.0 (SAP NetWeaver 7.00 or Higher)

To perform BIND and GRANT through a remote connection from SAP Solution Manager 4.0 on an SAP Web AS ABAP 7.00 system or higher, use the following procedure:

1. Apply SAP basis support package 12.
2. Download the executable db2radm patch 4 into your kernel directory.
3. Call the DBA Cockpit (or transaction DB2).
4. Define a connection to the DB2 subsystem of the MDM system.
5. In the Configuration section, choose JCL Settings (DB2J) to specify the TSO user ID to be used to run stored procedures. You do this in Profiles.
The TSO user ID must have sufficient privileges in the DB2 subsystem of the MDM system to grant authorization to the MDM connect user.
6. Specify the password for this user ID on the JCL Settings panel. For more information, see *Security Considerations for Stored Procedures* in the SAP DBA Guide for DB2.
7. Choose MDM Configuration in the Configuration section of the DBA Cockpit.
 1. Check whether the parameters for the DB2 subsystem of the MDM system are correct.
 2. Specify the MDM connect user.

8. Choose MDM Bind and Grant Action to perform the bind and grant task.

6.3.6.2 BIND and GRANT without SAP NetWeaver AS Java

Context

To perform a BIND and GRANT in an environment without SAP NetWeaver AS Java, perform the following:

Procedure

1. Download sapcar from the SAP Service Marketplace at <https://launchpad.support.sap.com/#/softwarecenter>. Go to ► *Support Packages and Patches* ► *Support Packages and Patches* ► *Browse our Download Catalog* ► *Additional Components* ► *SAPCAR* ► *<SAPCAR version>* ►
This tool enables you to unpack the files that you need to download to BIND and GRANT.
2. Unpack SAPEXEDB.SAR on your local system using SAPCAR.
3. Set the environment variable DIR_LIBRARY to location of unpacked executables.
4. Download DB2RADM and Kernel Part II (minimum Patch Level 48) to any location within the path you specified in the environment variable. You can download the support packages from the SAP Service Marketplace at: <https://launchpad.support.sap.com/#/softwarecenter>. Go to ► *Support Packages and Patches* ► *Browse our Download Catalog* ► *Additional Components* ► *SAP Kernel* ► *SAP KERNEL 64-BIT UNICODE* ► *<SAP KERNEL version>* ► *<Operating System>* ►
5. To BIND and GRANT, enter the following at the command prompt of your system:
db2radm -m mdmi -P <DDF Port> -L <DDF Location> -S <Database Name> -H <Host Name> -U <Database Connect User> -u <Admin User> -p <Admin Password>

6.3.7 Creating the STOGROUP (Optional)

When you initialize DB2 for MDM, the STOGROUP SAPMDM is created with the VCAT of STOGROUP SYSDEFLT. If you do not want this to happen, you must create the STOGROUP now.

6.3.8 Creating Foreign Keys

SAP MDM creates foreign keys very frequently. When a referenced table is converted, the status of the tablespace containing the table is set to CHECK PENDING. The MDS resets the CHECK PENDING status to read-write (RW) by calling the DB2 CHECK utility from the stored procedure DSNUTILS.

6.4 MaxDB

Context

If you plan to host MaxDB on the same machine as MDM, install only the MaxDB server software (which includes a MaxDB client). If the MaxDB server and MDS reside on different hosts, you must also install the MaxDB client software on the MDS host. Due to specific database restrictions, MDM repositories can contain no more than 17 data languages when working with MaxDB. The MaxDB client version must be at least 7.9.08.40.

You can use the MaxDB installation tool SDBSETUP. Please check the availability of this tool in your operating system. See SAP Note [2300026](#). If SDBSETUP usage is not possible, use the SDBINST template-based installation as described in the SAP Knowledge Base Article (KBA) [2610374](#).

Procedure

To install MaxDB:

1. Log on as a user *root*.
2. Install the MaxDB client software using the MaxDB Installation Manager:
 - a. Start SDBSETUP.
 - b. Start *installation/upgrade*.
 - c. Select component group *Client*.
 - d. Edit the following independent data path: `/sapdb/data`
 - e. Edit the following independent program path: `/sapdb/programs`
 - f. Install.
3. Install the MaxDB server software and create an MDM database instance using the MaxDB Installation Manager:
 - a. Start SDBSETUP.
 - b. Start *installation/upgrade*.
 - c. Select component groups *Server + Client*.
 - d. Choose *Install software and create database instance*.

- e. Select [SAP MDM](#).
 - f. Edit installation prefix `/sapdb` and define the following:
 - Database name (default: [MDM](#))
 - Password of the database manager operator (default user: [DBM](#))
 - Password of the database system administrator (default user: [DBA](#))
 - g. Define the locations of the database volumes (default: 1 DATA volume with 2 GB; 1 LOG volume with 200 MB)
 - h. Define the following system resource settings for the database:
 - Memory (default: [200 MB](#); increase for productive environment)
 - CPUs (default: [1](#); increase for productive environment)
 - Parallel database sessions - (default: [20](#); for productive environment, set at least [300](#))
 - i. Define the following global database settings:
 - Automatic start on system reboot (Windows only; default: [ON](#))
 - Automatic extension of data areas (default: [OFF](#))
 - Automatic statistics update (default: [OFF](#))
 - Log settings (default: [No LOG backup](#); only recommended for a test environment)
 - j. Install.
4. Plan and implement a log and backup strategy for a productive environment.
 5. For a productive environment, change the default value of the database parameter `MaxSQLLocks` from [50 000](#) to at least [650 000](#).
 6. To mount an MDM repository residing in a MaxDB DBMS (using MDM Console), specify the instance name and the database name of the MaxDB DBMS as the DBMS Server in the [Add DBMS Server](#) dialog.
This name should be defined using MaxDB syntax `instancename : dbname`.

Note

Use a semi-colon (;) as the delimiter when using CLIX with MaxDB.

Results

More Information:

- Details about MaxDB installation and operations at help.sap.com: Go to [SAP NetWeaver 7.0 > SAP NetWeaver by Key Capability > Databases > MaxDB](#).
- Frequently asked questions (FAQ) on MaxDB: SAP Note [820824](#).

6.5 SAP Adaptive Server Enterprise (ASE)

This section describes the specific configuration required to use a SAP ASE database with MDM. For general information about creating and managing a SAP ASE database, see infocenter.sybase.com/.

Note

The supported SAP ASE ODBC driver version is ASE 15.7 SP125 and higher. This version might not be supported on all the platforms that are supported by MDM. Check the MDM PAM for supported platforms.

6.5.1 Installing the SAP ASE Server

When you install the SAP ASE Server, configure the following settings via the console or via the SAP ASE GUI.

Field	Required Value
Application Type	Application Type: Online Transaction Processing (OLTP)
Page Size	16K
Default Character Set	Utf8: Unicode 3.1 UTF-8 Character Set
Default Sort Order	Binary : Binary ordering for UTF-16

6.5.2 Configuration of the SAP ASE Server

The following sections describe how to perform the tasks for a new installation:

- Place the log on a separate database device from the data
- Optimize performance of working with MDM
- Configure system procedures
- Install the Auto Expand feature
- Set minimum requirement for thread pool

Note

The following sections show configuration examples for SAP ASE 15.7. All sizes in the following examples are minimum requirements. The names, *tempdb*, *tempdbdev*, and *tempdblogdev* are used as examples. You can choose other names.

6.5.2.1 Separating Logs from Data

Procedure

1. In the Master database, add a *tempdb* log device. For example:

```
use master
disk init name = 'tempdblogdev',
physname = 'C:\sybase\data\tempdblogdev.dat',
size='512M'
```

Note

You can set any name for the *tempdb* log device. Modify the absolute path to match the environment and desired configuration.

2. In the Master database, add a *tempdb* device. For example:

```
disk init name = 'tempdbdev',
physname = 'C:\sybase\data\tempdbdev.dat',
size='512M'
```

3. Expand *tempdb* to put the log on a log device. For example:

```
alter database tempdb
on tempdbdev = '512M'
log on tempdblogdev = '512M'
```

4. Prevent future allocation of *tempdb* on the master device. For example:

```
USE tempdb
EXEC sp_dropsegment 'default', 'tempdb', 'master'
EXEC sp_dropsegment 'system', 'tempdb', 'master'
EXEC sp_dropsegment 'logsegment', 'tempdb', 'master'
EXEC sp_dropsegment 'logsegment', 'tempdb', 'tempdbdev'
```

6.5.2.2 Optimizing Performance

After installation, to optimize performance when working with MDM, we recommend that you configure the SAP ASE server as shown in the following example:

Example

```
EXEC sp_deviceattr 'tempdbdev', 'directio', 'false'
EXEC sp_deviceattr 'tempdbdev', 'dsync', 'false'
EXEC sp_deviceattr 'tempdblogdev', 'directio', 'false'
```

```
EXEC sp_deviceattr 'tempdblogdev', 'dsync', 'false'
```

6.5.2.3 Additional Configuration

Ensure that the values for the following system procedures comply with the minimum required values:

System Procedure	Minimum Required Value
<i>max memory</i>	1132156
<i>number of open devices</i>	500
<i>number of open locks</i>	250000
<i>user conn</i>	500
<i>heap memory per user</i>	8192
<i>size of global fixed heap</i>	1024
<i>statement cache size</i>	0, '200M'
<i>procedure cache size</i>	0, '512M'
<i>allocate max shared memory</i>	1
<i>default data cache</i>	'1024M'
<i>number of open indexes</i>	5000
<i>number of open objects</i>	5000
<i>number of open partitions</i>	5000
<i>number of open databases</i>	50
<i>enable functionality group</i>	1
<i>enable literal autoparam</i>	1
<i>enable plan sharing</i>	0
<i>max online engines</i>	16
<i>kernel resource memory</i>	8192
<i>lock scheme</i>	0, 'datarows'

6.5.2.4 Installing Automatic Database Expansion

Context

Install automatic expansion using the *installdbextend script*, which defines defaults for automatic expansion in a database or device.

ⓘ Note

In the command shown, you can use the `-i` flag (lowercase i) or `<` before the script location; they are equivalent. The command in the step contains `<`.

Procedure

- Run `isql -User -Password -Sserver_name <$SYBASE/$SYBASE_ASE/scripts/installdbextend`

6.5.2.5 Configuring the Thread Pool

Configure the thread pool setting to comply with the following minimum requirement: `ALTER THREAD POOL syb_default_pool WITH THREAD COUNT = 2`

6.5.3 Installing and Configuring the SAP ASE ODBC Client

The MDM installation prompts you to configure the SAP ASE client settings.

ⓘ Note

For LINUX only:

MDM uses the ODBC methods with `SQLLEN=8`. When installing the SAP ASE ODBC client on LINUX, the library containing `libsybdrvodb.so` might be created with a symbolic link to `libsybdrvodb-sqllen4.so`. In this case, change the symbolic link to point to `libsybdrvodb8.so` instead of `libsybdrvodb-sqllen4.so`.

6.5.4 Configuration of MDS.INI Settings

When SAP ASE is selected as a database in the MDM installation, the following settings are available in the `mds.ini` file. These settings are used when creating a new repository.

Parameter	Description
SAP ASE main repository data device size	Number. The amount of space to allocate to the data device on the file system for the main repository database. This defines the maximum size of this database. The default is 2048.
SAP ASE main repository log device size	Number. The amount of space to allocate to the log device on the file system for the main repository database transaction logs. The default is 512.
SAP ASE history repository data device size	Number. The amount of space to allocate to the data device on the file system for the history repository database. This defines the maximum size of this database. The default is 1024.
SAP ASE history repository log device size	Number. The amount of space to allocate to the log device on the file system for the history repository database transaction logs. The default is 512.
SAP ASE Library Path	The path to the SAP ASE library that was set during installation.

Note

- Consider size requirements for repository size and history size when deciding whether to change these values.
- When you change the values of these parameters, current repositories are not affected.
- If you receive an error that SAP ASE is unable to allocate space in a database, you might need to increase the value for the relevant device size parameter. For more details, see SAP Note [1990174](#).

6.6 SAP HANA (For MDM-SRM Only)

The SAP HANA database is only supported for MDM-SRM. This section describes the specific configuration required to use a SAP HANA database with MDM-SRM. For information about installing the SAP HANA ODBC client, see [SAP HANA Client Installation Update Guide](#).

Install the SAP HANA ODBC client before installing MDM.

The MDM installation prompts you to configure the SAP HANA client settings.

After installing MDM, add the following `mds.ini` settings for SAP HANA:

Parameter	Description
HANA Repository Type	The type of HANA repository - COLUMN (recommended) or ROW
HANA DSN Connect	A boolean value (True False) to enable the usage of Data Source Names. If set to True, then DSNs will be used. If the value is set to False, then the old behavior (using the hostname and port) will be used. For more information, see ► SAP HANA Client ► SAP HANA Client Interface Programming Reference ► Connect to SAP HANA via ODBC ►.
HANA Library Path	The path to the HANA library that was set during installation. By default this is <code>/usr/sap/hdbclient</code>

7 Post-Installation Tasks

To make your installed MDM system a running system, test and set up the MDM servers and the database connection. You can also set up secure communication (SSL) for the MDM servers.

❗ Note

If you are not planning to use SSL, ensure that the following is set in the `mds.ini` file: `SSL Enabled=False`. The SSL key path option should be left empty.

Prerequisites

See SAP Note [1574751](#) 

7.1 Environment Variables for MDS

In the dialog-phase of the software provisioning manager you are prompted for necessary information about how to configure the MDS instance to connect to a certain database. The MDS needs to find and load the DB client libraries to be installed on the host where MDS is running.

The paths to these libraries are added to a number of shell scripts, which are created in the home folder of the `<sapsid>adm` user. If necessary, you can change these variables in the database configuration scripts for MDM manually.

The following table provides an overview of the script files:

Shell Script	Description
<code>.mdmdbenv_<hostname>.sh</code>	Database configuration script for Bourne-compatible shell (<code>/bin/sh</code>). This is the default script that is launched at login of user <code><sapsid>adm</code> .
<code>.mdmdbenv_<hostname>.csh</code>	Database configuration script for C-Shell (<code>/bin/csh</code>). This is the default script that is launched at login of user <code><sapsid>adm</code> .
<code>.mdmdbenv_<hostname>.csh</code>	Database configuration script for Bourne-compatible shell (<code>/bin/sh</code>). This script is launched when <code>.mdmdbenv_<hostname>.sh</code> does not exist.

Shell Script	Description
<code>.mdmdbenv.csh</code>	Database configuration script for C-Shell (<code>/bin/csh</code>)
	This script is launched when <code>.mdmdbenv_<hostname>.csh</code> does not exist.

These scripts contain variables that are used to configure MDS to load a DB client library and connect to a DBMS.

Note

For DB2 you can use the existing database configuration script in the `mdmbenv` scripts. Each DB2 database manager instance has the script file `sqllib/db2profile`, which is in the home directory of the instance. This script sets up the environment for DB2 automatically. You can add this script to `.mdmdbenv_<hostname>.sh` or to `.mdmdbenv.sh`. It is not compatible with the C-Shell so you cannot use it with `.mdmdbenv.csh` or `.mdmdbenv_<hostname>.csh`.

Procedure

1. Open the database scripts and change the setting(s). It is sufficient only to change the settings in the script that is used at login (see table above). However, we recommend that you keep the settings in the different script files in sync.

The software provisioning manager has set the following variables:

Variable	Database	Description
• <code>MAXDB_UTILITIES_HOME</code>(sh) • <code>MAXDB_UTILS_HOME</code> (csh)	MaxDB	MaxDB utilities, for example <code>/sapdb/programs/bin</code>
• <code>MAXDB_CLIENT_LIBRARY_HOME</code> (sh) • <code>MAXDB_CLIENT_HOME</code> (csh)	MaxDB	MaxDB client library (<code>libSQLDBC76.C.xx *</code>)
<code>ORACLE_HOME</code>	Oracle	Oracle installation home
<code>ORACLE_SQLPLUS_HOME</code>	Oracle	Oracle SQLPlus utility
• <code>ORACLE_CLIENT_LIBRARY_HOME</code> (sh) • <code>ORACLE_CLIENT_HOME</code> (csh)	Oracle	Oracle client library
• <code>DB2_CLIENT_LIBRARY_HOME</code> (sh) • <code>DB2_CLIENT_HOME</code> (csh)	DB2	DB2 client library (<code>libdb2.xx *</code>)

* `.xx` is the platform-specific extension for shared libraries, for example `.sl`, `.so`, or `.a`.

2. Restart the MDS instance in one of the following ways:
 - Using SAP MMC: Right-Click the instance-node and choose *Restart*.
 - Using `sapcontrol`: Enter the following command: `sapcontrol -nr <instance number> -function RestartInstance`

7.2 Starting and Stopping the MDM Servers

The software provisioning manager automatically starts the SAP system and its instances after the installation. Start and stop the MDM servers to check if the installation was successful.

⚠ Caution

After stopping MDS and the database, restart the database first.

To start and stop MDM servers, use the following tools:

- [SAP Microsoft Management Console \(SAP MMC\)](#) or [SAP Management Console \(SAP MC\)](#): SAP MMC and SAP MC are the generic SAP system management tools, which are installed automatically with any SAP system (SAP MMC on Windows; SAP MC on IBM i and UNIX).
- [MDM Console](#) or [MDM CLIX](#): The MDM Console is the MDM administration Windows client for system, authorization, repository management, and other administration tasks. MDM CLIX is a Windows command line tool that provides functions of the MDM Console.

In a heterogeneous system landscape, you can also start and stop an IBM i or UNIX system with the Windows-based SAP MMC, MDM Console, and MDM CLIX.

⚠ Caution

If you cannot start or stop the SAP system using SAP MMC and you get an [Unauthorized Error](#), even though you made sure that you are using valid credentials, see SAP Note [927637](#).

7.2.1 Using SAP Microsoft Management Console

Prerequisites

- You have logged on to the SAP system host as user `<sapsid>adm`.
- You have checked the settings for VM parameters as described in SAP Note [723909](#).

Context

Use this procedure to check that you can start and stop the SAP system with the SAP Microsoft Management Console (SAP MMC) after the installation.

With the newly installed SAP MMC, start or stop installed SAP instances 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.

Procedure

1. Start the SAP MMC on the SAP system host by choosing **Start** > **All Programs** > **SAP Management Console**.
2. Right-click the SAP system node and choose **Start** or **Stop**. All instances listed under the system node start or stop in the correct order.
3. If the SAP system is installed on multiple hosts (distributed system), use one of the following options to start or stop your system:
 - Start or stop the SAP instances using the SAP MMC on each host.
 - Add the remote instances to the SAP MMC configuration to start or stop all instances from a single SAP MMC. For more information, see the *SAP MMC system* documentation.

7.2.2 Using SAP Management Console

Prerequisites

Make sure that the host on which you start SAP MC meets the following requirements:

- Java Runtime Environment (JRE) 5.0 is installed.
- The browser supports Java.
- The browser's Java plug-in is installed and activated.

You have logged on to the host as user `<sapsid>adm`.

Context

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

Note

If the newly installed SAP system is part of a heterogeneous SAP system landscape comprised of systems or instances on Windows platforms, you can also start and stop it from a Windows system or instance using the Microsoft Management Console (MMC). For more information about handling the MMC, see the [Using SAP Microsoft Management Console \[page 85\]](#) section.

Procedure

1. To start the SAP MC Java applet, start a Web browser and enter the following URL: **http://<hostname>:5<instance_number>13**
Example: If the instance number is *53* and the host name is *saphost06*, you enter the following URL:
http://saphost06:55313
2. Choose *Start*. The *SAP Management Console* appears.

ⓘ Note

When you start the SAP MC for the first time for a newly installed SAP system, you must register your system as described in Registering Systems and Instances below. Once this is done, the instances installed on the host to which you have connected are already added in the SAP MC when you start the SAP MC next time. By default, the instances installed on the host you have connected to are already added in the SAP MC. To change the configuration to display systems and instances on other hosts, see Registering Systems and Instances below.

7.2.2.1 Starting an SAP System or Instance

Context

Procedure

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

ⓘ Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you must have administration permissions. Log in as user **<sapsid>adm**.

7.2.2.2 Stopping an SAP System or Instance

Context

Procedure

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

Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you must have administration permissions. Log in as user `<sapsid>adm`.

7.2.2.3 Registering Systems and Instances in the SAP Management Console

Prerequisites

The SAP MC is started.

Context

You can extend the list of systems and instances displayed in the SAP MC, so that you can monitor and administer all systems and instances from a single console. You can configure the SAP MC startup view to display the set of systems and instances you want to manage.

Procedure

1. To register SAP systems:

- a. In the SAP MC, choose ► **File** ► **New** .
- b. In the **New System** dialog box, enter the required data.

If you have already registered systems in the SAP MC, they are stored in the history. To open the system's **History** dialog box, choose the browsing button next to the **Instance Nr.** field. Select an instance of the system that you want to add and choose **OK**.

- c. Choose **Finish**.

2. To register individual instances:

- a. In the SAP MC, choose ► **File** ► **New** .
- b. In the **New System** dialog box, enter the required data and deselect **Always show all SAP Instances**.

The SAP MC displays the SAP system node and the instance node in a tree view in the navigation pane. To view all instances of the respective SAP system, select the relevant system node and choose **Add Server** from the context menu.

7.2.2.4 Configuring the SAP MC View

Context

Procedure

1. To choose the instances that the SAP MC displays automatically on startup:
 - a. In the **Settings** dialog box, select **History**.
 - b. In the right-hand side pane, choose the instance you want the SAP MC to display on startup.
 - c. Choose the **ADD<<** button.
 - d. Choose **Apply** and then choose **OK**.

Similarly, you can remove instances from the startup configuration.

2. To save the current configuration in a file:
 - a. Choose ► **File** ► **Save Landscape** .
 - b. In the **Save** dialog box, enter the required data.
 - c. Choose **Save**.
3. To load a configuration from a file:
 - a. Choose ► **File** ► **Load Landscape** .
 - b. In the **Open** dialog box, select the configuration you want to load.

- c. Choose *Open*.

7.2.3 Using MDM Console or MDM CLIX

You can start and stop MDM server instances on all supported platforms using the following MDM administration clients:

- The command line tool MDM CLIX: CLIX is automatically installed with any MDS instance on any platform. It can be installed separately on Windows platforms.
- The Windows GUI client MDM Console: The MDM Console must be installed separately on Windows 32-bit platforms (for example on a PC).

More Information

- *Accessing an MDM Server* section in the *MDM Console Reference Guide* at help.sap.com/nwmdm71
- *MDM Server Commands* section in the *MDM CLIX Command Reference Guide* at help.sap.com/nwmdm71

7.2.4 Using Scripts

Start and stop the SAP system for MDM by running the `sapcontrol` utility.

7.2.4.1 Starting the SAP System

Prerequisites

You have logged on to the SAP system hosts as user `<sapsid>adm`.

Context

To start all instances on an MDM system host :

Procedure

Enter the command **sapcontrol -nr <instance number> -function StartSystem**, where <instance number> is the number of one of the MDM server instances of the SAP system you want to start.

ⓘ Note

You can start the MDM server instances separately by entering the command **sapcontrol -nr <instance number> -function Start**, where <instance number> is the number of the MDM server instance you want to start.

7.2.4.2 Stopping the SAP System

Prerequisites

You have logged on to the SAP system hosts as user *<sapsid>adm*.

Context

To stop all instances on an MDM system host:

Procedure

Enter the command **sapcontrol -nr <instance number> -function StopSystem**, where <instance number> is the number of one of the MDM server instances of the SAP system you want to stop.

ⓘ Note

You can stop the MDM server instances separately by entering the command **sapcontrol -nr <instance number> -function Stop**, where <instance number> is the number of the MDM server instance you want to stop. Make sure that you always stop the MDS instance first.

7.3 Setting Up SSL Communication for MDM Servers

Starting from version 7.1 SP07, you can set up SSL (Secure Sockets Layer) communication during an installation or update of MDS, as described in the following sections.

7.3.1 Setting Up SSL During MDS Installation or Update

Prerequisites

You are using the MDM 7.1 Installation Master, which can be downloaded from SMP (Service Market Place).

Context

In the *Install all Servers for MDM* tool:

Procedure

1. In the *Setup for the MDM SSL Installation* step, select the *Setup MDM for Secure Socket Layer Connection* checkbox.
2. From the *MDM Listening Mode* dropdown, select either *SLL* or *Both*.

Note

In a new installation, the software provisioning manager automatically sets the MDM listening mode in the MDM servers' ini files. When you update MDM servers, set this parameter manually in the ini files, as described in SAP Note [1563249](#).

3. Specify the following strings:
 - *Organization*
 - *Country* (2 letter string)
The software provisioning manager uses these strings, the *Common Name*, which is the fully qualified server name, and the *SSL TCP Port* of the MDM server, to create the server and client keys.
4. Choose *Next*.

7.3.2 Post-Installation/Update Tasks for SSL

After the installation or update is complete, the following files are created in the exe folder of the global host:

File	Description	Comments
client.pse	Client key of the SSL communication. The MDM clients will need this file to connect to the MDM servers.	
SAPSSLS.pse	Server key of the SSL communication. The MDM servers will need this file.	Copied also to the sec folder of the MDM servers.
cert.crt	Certificate files that are used to connect the MDM server to the WAS (Web Application Server) in secure mode.	
cred_v2	For internal use.	
ticket	For internal use.	Copied also to the sec folder of the MDM servers

For information about creating the client and server keys manually, see SAP Note [1562668](#) .

7.3.2.1 Verifying SSL Communication

Context

To verify that SSL is set up correctly:

Procedure

- For every server instance (MDS, MDIS), verify that the framework is set to secure HTTPS mode:
 - Log in to the MDM server using the <SID>adm account.
 - In the command line, type the command **sapcontrol.exe -nr <NR> -function GetAccessPointList**
 - Verify that the HTTPS access point is available in the access point list. If HTTPS is not in the access point list, try to restart the instance service and check again.
- In the MDM ini files (mds.ini, mdis.ini), verify that the following parameters are set:
 - Listening Mode=Both** or **SSL**
This parameter is set by the MDM listening mode parameter in the installation.
 - SSL Lib Path=** [Path to the servers' sapcrypto library, which must be located in the servers' exe folder]

- `SSL Key Path=` [Path to the servers' key file `SAPSSLS.pse`, located in the servers' `sec` folder]
3. Enable the MDM Import Server to work as clients with the MDM servers by setting the following parameters manually after an MDS installation or update:
- `Service Control Security Enabled=True`
Default is `True`.
 - `SSL Enabled=True`
Default is `False`.
 - `SSL Key path=` [Path to the client key file `client.pse`, located in the `exe` folder of the global host]
 - `SSL Lib path=` [Path to the servers' `sapcrypto` library, which must be located in the servers' `exe` folder]

MDM applications on IBM i or UNIX and Linux should not be configured to use secure connections to `SAPStartSrv`. The `mds.ini` file setting "*Service Control Security Enabled*" should be set to "*False*".

7.3.3 Setting Up SSL in a Master/Slave Environment

Context

If your MDM environment uses MDM master/slave technology, you must set up the slaves after installation.

To use master/slave with SSL, the following entries in your master and slave `mds.ini` server files must refer to the remote server. This is necessary even if the master and slave repositories are on the same MDM server instance.

MDM applications on IBM i or UNIX and Linux should not be configured to use secure connections to `SAPStartSrv`. The `mds.ini` file setting "*Service Control Security Enabled*" should be set to "*False*".

Procedure

Set the parameters as follows:

```
[MDM Server]\[Remote Server]\[Master Server Name]:[SSL Listening Port]
Service Control Security Enabled=False
SSL Enabled=True
SSL Lib Path=/usr/sap/[SID]/MDSxx/exe/libsapcrypto.so
SSL Key Path=/usr/sap/[SID]/MDSxx/sec/SAPSSLS.pse
```

7.3.4 Using CLIX with SSL

Context

To use CLIX with SSL, you must configure the `clix.ini` file, which is located in the same location as the `clix.exe`: `/usr/sap/<SAPSID>/<Instance Folder>/exe`

Procedure

In the `clix.ini` file, add the path to the `sapcrypto.dll` and set the *SSL Lib Path* and the *Service Control Security Enabled* parameters as follows:

```
[MDM Server]\\[Remote Server]\\[Master Server Name]:[SSL Listening Port]
Service Control Security Enabled=True
SSL Enabled=True
SSL Lib Path=/usr/sap/[SID]/MDSxx/exe/libsapcrypto.so
SSL Key Path=/usr/sap/[SID]/MDSxx/sec/SAPSSLS.pse
```

7.4 Setting up MDM Servers

To set up the MDM servers after installation, use the MDM configuration files and the MDM Console.

You configure the MDM servers and test the system by mounting the MDS and connecting to the database. In addition, you set MDS and repository passwords for secure MDM operation.

Note

Saphostcontrol (on port 1128) is used for communication between MDM servers and MDM Console.

7.4.1 Configuring MDM Servers

When the MDM server instances (MDS, MDIS) are installed, the following configuration files are created in the `config` directory of the instances:

- `mds.ini`
- `mdm_list.ini`

In the configuration (`ini`) files, you can change a broad range of default server settings as required.

For more information about the individual settings and their effects, see the following points at help.sap.com/nwmdm71:

- `mds.ini` and `mdm_list.ini`: *MDM Console Reference Guide*, section *MDS Configuration*
- `mdis.ini`: *MDM Console Reference Guide*, section *MDIS Configuration*

7.4.2 Mounting MDS and Connecting the Database

Context

To check if MDM and the database are installed and configured correctly:

Procedure

1. Start the MDM Console.
2. Mount the MDS and connect to the database.

For more information, see *MDM Console Reference Guide*, section *MDM Server Administration* at help.sap.com/nwmdm71

7.4.3 Setting MDS and Repository Authentications

By default, access to new MDS and MDM repositories is not limited. For a secure, productive use of MDM, you must set passwords using the MDM Console to control access:

- When mounting an MDS for the first time, make sure that you set a password for the new MDS.
- When creating a new repository or unarchiving a repository, make sure that you set passwords for the predefined users, especially for the *Administrator* user.

Note

Starting in MDM 7.1 SP08, the default password for the *Administrator* user is *sapmdm*, and can no longer be empty.

For more information, see *MDM Console Reference Guide*, section *MDM System Administration* at help.sap.com/nwmdm71

8 Multiple MDM Servers on a Single Host

You can install multiple instances of MDM Servers (including MDS, MDIS) on a single host. The instances of MDM Servers can be from different versions of MDM (such as 5.5 and 7.1), which may be useful when upgrading from one MDM version to another, or multiple instances of MDM 7.1 SP04 and above.

For more information about a MDM 7.1 side-by-side scenario for upgrade purposes, see the *Upgrade Guide* at help.sap.com/nwmdm71

⚠ Caution

- When installing multiple instances of MDM 7.1 servers on the same host, each set of MDM servers must have a unique SAP System ID (SID). Within a single set of servers, each server, MDS, MDIS, can have the same SID.
- Starting from MDM 7.1 SP06, running multiple instances of Master Data Server, at the same time, on the same host, is supported.
- To start and stop the MDM servers on hosts with multiple MDM 7.1 Server instances, use the SAP Microsoft Management Console (SAP MMC), SAP Management Console (SAP MC), or scripts. Starting from MDM 7.1 SP06, you can also use MDM Console or CLIX for these tasks.

8.1 Running Multiple MDM Server Components on a Single Machine

Starting from MDM 7.1 SP06, you can install and run multiple MDM server components on one physical machine.

The advantages of installing multiple MDM server components on a single machine instead of loading multiple MDM repositories on a single Master Data Server (MDS) are:

- You can perform parallel execution of imports to and from loaded MDM repositories.
- Two repositories for separate projects on two different MDM versions can reside on the same machine, which results in reduced TCO.

Each Master Data Import Server (MDIS) must be configured to work with only one particular MDS. You can distribute the MDM server components according to the following hardware configuration options:

- Multiple Master Data Servers on one machine with remote MDM Import Servers on a second machine, and a DBMS on a third machine.
- Multiple Master Data Servers and MDM Import Servers on one machine with a remote DBMS on a separate machine.
- Multiple Master Data Servers, MDM Import Servers, and a DBMS all on one machine.

Test results show that hardware sizing parameters are almost identical for all the aforementioned configuration options; therefore the configuring option you choose should be based solely on your preferred hardware setup.

8.2 Unarchiving and Updating MDM Repositories

All MDM repositories used with a Master Data Server must be from the same version as that Master Data Server. To avoid data problems due to schema differences among MDM versions, repositories should only be unarchived and updated from earlier to later versions—never the opposite.

9 Updating MDM Servers

Prerequisites

- This description assumes that you installed your SAP system with standard SAP tools according to the installation documentation.
- You are logged on as *root*.
- You know how to start the installation with the software provisioning manager.

Context

This section describes how to update MDM servers with the Update option of the software provisioning manager, for example to implement support packages or patches.

The Update option allows you to update the complete SAP system from one host, even if the system was installed on several hosts (distributed system). For performance reasons, run the update on the host where you installed the first MDM instance.

Note

When upgrading NW MDM 7.1 to SP17 and above, you must also upgrade the newest framework using the software provisioning manager.

Note

When updating single instances, be aware that updates can only be installed based on MDM server types and host types.

For example, if you choose to update one MDS instance running on a Linux x86_64 host, all other MDS instances of this SAP system running on other Linux x86_64 hosts are updated as well.

Procedure

1. Start the software provisioning manager and on the *Welcome* screen, choose ► *MDM 7.1* ► *Additional Software Life-Cycle Options* ► *Update MDM* ►.
2. Follow the instructions in the software provisioning manager input dialogs.

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  or the *HELP* tab. Then the available help text is displayed in the *HELP* tab.

Related Information

[Running Software Provisioning Manager \[page 45\]](#)

10 Uninstalling MDM Servers

Prerequisites

- It is assumed that you have installed your SAP system with standard SAP tools according to the installation documentation.
- You are logged on as user [root](#). If the [saposcol](#) process on the host where you are working has been started from the SAP system that you want to delete, stop the process using the command `saposcol -k`. If there are other SAP systems on the host, log on as user `<sapsid>adm` of the other SAP system and start [saposcol](#) from there using the command `saposcol -l`.
- You know how to start the software provisioning manager. For more information, see [Running Software Provisioning Manager \[page 45\]](#)

Context

You can uninstall MDM servers by deleting a single instance or a complete SAP system with the [Uninstall](#) option of the software provisioning manager.

⚠ Caution

Make sure that you stop, archive, and store the MDM repositories that you want to reuse. In the software provisioning manager un-installation procedure, keep the [Archive](#) folder and other folders (see below). 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.

Procedure

1. Start the software provisioning manager and on the [Welcome](#) screen, choose ► [MDM 7.1](#) ► [Additional Software Life-Cycle Options](#) ► [MDM Uninstallation](#) ►.
2. Follow the instructions in the software provisioning manager input dialogs.

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 software provisioning manager first asks you which SAP instances to delete. Note the difference between central and distributed systems:

- You can delete a central system (all instances reside on the same host) in one software provisioning manager run.
- To delete a distributed system, run the software provisioning manager to delete the required instances locally on each of the hosts belonging to the SAP system.

Note

The software provisioning manager only stops local instances automatically.

The software provisioning manager asks you if you want to keep the MDM-specific folders and files located under `/usr/sap/<SAPSID>` for reuse. You can keep the following:

- Configuration files (`.ini`)
- Log files
- Archives (MDS only)
- Distribution files (MDS only)
- Reports (MDS only)

If you created the directories `/usr/sap/<SAPSID>` and `/<sapmnt>/<SAPSID>` as mount points, but not as directories on the local file system, you must remove them manually.

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