



Upgrade Guide | PUBLIC

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SAP SCM 7.0 EHP 2 and higher – Upgrade of Standalone Engine SAP liveCache Technology 7.9 on UNIX

Operating System: UNIX and Linux

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Document History

i Note
Before you start the implementation, make sure you have the latest version of this document, which is available at <https://help.sap.com/scm>.

Version	Date	Description
1.05	2019-10-02	Updated version
1.04	2017-07-17	Updated version
1.02	2015-05-28	Updated version
1.01	2015-01-28	Updated version
1.00	2013-10-09	Initial version

1 Introduction

This documentation describes how to upgrade an SAP liveCache instance from at least Release 7.5 to Release 7.9. SAP liveCache is used in SAP Supply Chain Management (SCM).

⚠ Caution

If you have a high-availability (HA) liveCache with a cluster environment, see SAP Note [2113981](#) for more information before starting the upgrade. In addition check SAP Note [1855747](#) for more information about the potential upgrade combinations.

For more information about SAP SCM technology, see <https://help.sap.com/scm> <Version>.

1.1 Before You Start

Make sure that you read the following sections before you start the upgrade.

[SAP Notes for the Upgrade \[page 4\]](#)

Make sure that you have read the following SAP Notes before you start the upgrade.

[Naming Conventions \[page 5\]](#)

1.1.1 SAP Notes for the Upgrade

Make sure that you have read the following SAP Notes before you start the upgrade.

Note Number	Title
1566982	Enhancements to the upgrade to liveCache 7.9
498036	Overview note: Importing MaxDB/liveCache versions
1567117	Parameter values for liveCache version 7.9
337445	liveCache and Memory Management
487972	Operating system parameterization of liveCache
829408	Upgrading a database in the UNIX cluster
1248891	SAP SCM Upgrade on liveCache OneDB

Note Number	Title
2113981	SAP MaxDB / liveCache / Content Server Maintenance in High Availability System Environment
2158713	Strategy for resetting an SAP MaxDB to an older database version

⚠ Caution

Before you begin the upgrade, make sure that you read **SAP Note [1072392](#)** because it contains current information and corrections essential to the upgrade.

1.1.2 Naming Conventions

Release Names

Where release descriptions are used in the following documentation, they correspond to the following SAP SCM Releases:

Release of SAP Web Application Server or SAP NetWeaver	Release of SAP SCM
6.40	4.1
7.0	5.0, 2007 (5.1)
7.01	7.0
7.02	7.01
7.03	7.02, 7.03

SAP System

The SAP system name is called `SAPSID` below. Follow the notation in pointed brackets. If `<SAPSID>` is used, insert your SAP system name, for example `PRD`.

<SAPSID> User Name

The user name is written in uppercase and abbreviated with `<SAPSID>ADM`.

⚠ Caution

Always enter the user name `<sapsid>adm` in lowercase for the standalone database server.

liveCache Application Routines

The liveCache application routines are called “liveCache applications”. The application area is BC-DB-LCA, where the abbreviations have the following meanings:

- BC means Basis components
- DB means database
- LCA means liveCache applications

2 Planning

To plan the upgrade, you need to do the following.

Procedure

1. You [check the software requirements \[page 7\]](#).
2. You [choose an upgrade strategy \[page 8\]](#).
3. If you are using SCM 5.1 or lower, you can use the liveCache DVD in the SCM 7.0 EHP2 package.

2.1 Checking Software Requirements

Before you start the upgrade, you must check the software requirements.

Procedure

1. Check that:
 - SAP liveCache is ready to run.
 - The system tables have been loaded at least once for the existing instance.
 - The database parameters of the database instance that you want to upgrade have not changed since the last restart.
 - The starting version of SAP liveCache (that is, before the upgrade) is at least **7.5**.

2. Check your operating system release.



For the most up-to-date release information on the database and operating system of your product, check the SAP Product Availability Matrix (PAM) as follows:

- a. Go to <https://support.sap.com/pam>.
- b. Search for your SCM release.

EHP2 for SAP SCM 7.0

- c. Choose **► Technical Release Information ▾**.
- d. In the table, choose *Details* in the row *SAP LiveCache* and column *Operating Systems*.
- e. Click *Display* in the column *Additional Information* to see the number of the note with additional information on required operating system patch levels and patches for C++ RTE.

For additional operating system requirements, see the following SAP Notes:

- [337445](#)  *liveCache and Memory Management*
- [487972](#)  *Operating System Parameterization of liveCache*

2.2 Choosing an Upgrade Strategy

The upgrade strategy you choose depends on your existing release of SAP liveCache, your start release, and your target release of the SAP system.

Prerequisites

The upgrade strategies differ as follows:

- **Inplace upgrade**
Inplace upgrade does not change the structure, as occurs when the start and target releases for the SAP system or the SAP liveCache database are different. Therefore, only the SAP liveCache software is updated during an inplace upgrade.
- **SCM Extract / Load Upgrade**
With the SCM extract / load upgrade, transaction data is backed up using ABAP reports during the SCM system upgrade, that is, **before** the SAP liveCache upgrade. This type of upgrade overwrites data files and devspaces from SCM Release 4.1, 5.0, or 5.1 during the installation of the new SAP liveCache software. You do not need to first deinstall anything. Finally, the SAP liveCache instance is recreated and initialized.

Note

SCM Release 4.0 is **not** supported as a start release for the upgrade.

Caution

Use the SCM extract / load upgrade strategy **only** for an **SCM upgrade** to 7.0 EHP2 or higher (which uses SAP liveCache 7.9) when your SCM start release is 4.1, 5.0, or 5.1.

Procedure

- Choose your upgrade strategy in one of the following ways:
- Follow the instructions in the relevant SAP system upgrade documentation.
- Use the tables below to determine your upgrade strategy.

SAP liveCache Upgrade During an SCM Upgrade

SCM Start Releases	SCM Target Release	SAP liveCache Kernel Start Release	Upgrade Strategy
4.1, 5.0, 2007 (5.1)	7.0 or higher	>=7.5	SCM extract / load upgrade
7.0 or higher	7.0 EHP1 or higher	7.7	Inplace upgrade

SAP liveCache Upgrade Without an SAP System Upgrade or an SCM Enhancement Package Installation

SAP liveCache Kernel Start Release	SAP liveCache LCA Start Release	Upgrade Strategy
7.7	7.0	Inplace upgrade

For the second table shown above, the SAP SCM start release is 7.0 or 7.0 EHP1 and the SCM target release is 7.0 EHP2 or higher, which is called [SAP LC/LCAPPs 10.0](#) in the Software Distribution Center (SWDC).

3 Preparation

This section contains the preparation steps you must perform before you start the upgrade.

Procedure

You [complete the upgrade preparations \[page 10\]](#).

3.1 Completing the Upgrade Preparations

You complete the upgrade preparations as follows.

Procedure

- SCM Extract / Load Upgrade

i Note

The report /SAPAPO/OM_LC_UPGRADE_70 issues a message when it is time to upgrade liveCache.

- a. Make sure that, during the REQ_APOUPG phase of the SCM upgrade, the SAP liveCache transaction data is downloaded to the SCM database.

i Note

You **cannot** start the upgrade without a successful download. You do **not** need to copy the master data to the SCM database, because master data – unlike transaction data – is already present in the SCM database (this is true for the SCM system at all times).

- b. Make sure that you stop SAP liveCache in the REQ_APOUPG phase.
- c. If an SCM instance or another SAP MaxDB instance is running on the SAP liveCache server, stop it.
- d. Stop the server for Remote SQL using the command:

x_server stop.

- e. Stop all DBMGUIs and all DBMCLI sessions.

- Inplace Upgrade

- a. Stop SAP liveCache with transaction LC10.
- b. If an SCM instance or another SAP MaxDB instance is running on the SAP liveCache server, stop it.
- c. Stop the server for Remote SQL using the command:

`x_server stop.`

- d. Stop all DBMGUIs and all DBMCLI sessions.

4 Upgrading SAP liveCache

This section describes how you upgrade SAP liveCache.

⚠ Caution

Do **not** perform the following update steps if your liveCache is integrated into a high-availability (HA) environment. See the HA information in [Introduction \[page 4\]](#).

Procedure

⚠ Caution

When upgrading large SAP liveCache instances, make sure that - regarding system limits - the environment of the OS user `root` corresponds to the environment which is normally used for the SAP liveCache instance. Otherwise, the upgrade process might stop due to insufficient limit settings.

1. Log on as user `root`
2. Start the upgrade tool with the liveCache DVD or with the downloaded software from the Software Download Center (SWDC):
 - liveCache DVD:
 1. Load and mount the SAP liveCache DVD.
 2. Start the upgrade tool from the SAP liveCache DVD as follows:
`<SAP liveCache DVD>/DATA_UNITS/LC_UPDATE/LCUPDATE.SH`
 - SWDC:
Start the upgrade tool from the downloaded and extracted file as follows:
`SDBUPD`
3. Enter or (if you are using SDBUPD) select the SAP liveCache name, DBM user, and DBM password (that is, for the control user).

5 Performing Post-Upgrade Steps

You perform the following post-upgrade steps:

Procedure

1. You [perform post-upgrade activities \[page 13\]](#).
2. You [set up a liveCache user \[page 15\]](#).
3. You [install or upgrade Database Studio \[page 16\]](#).

5.1 Performing Post-Upgrade Activities

You must perform the following post-upgrade activities.

Procedure

1. Check the setting of `OMS_HEAP_LIMIT` as described in SAP Note [1567117](#).

⚠ Caution

It is essential that the SAP liveCache parameter `OMS_HEAP_LIMIT` is set to a value greater than zero. The unit for this parameter is KB. If you have to change this parameter, restart the SAP liveCache instance so that the change takes effect.

2. Check the instructions in SAP Note [1567117](#) to parameterize the SAP liveCache Release 7.9 server.
3. Before you upgrade the primary application server instance or additional application server instance(s), make sure that you have stopped the primary application server instance and additional application server instance(s).

This is required for the SAP liveCache client software upgrade.

4. Upgrade the database client software for the host where the primary application server instance and additional application server instance(s) are running, depending on whether your client is running on UNIX or Windows:
 - **Your Client is Running on UNIX**
 1. Log on as the `root` user.
 2. Stop the primary application server instance or additional application server instance(s).

3. Start the client software upgrade with the SAP liveCache DVD or with the downloaded software from the Software Distribution Center (SWDC) (<https://support.sap.com/en/my-support/software-downloads.html>):
 - SAP liveCache DVD:


```
<SAP liveCache DVD>/DATA_UNITS/LC_UPDATE/LCUPDATE.SH -client
```
 - SWDC:


```
SDBINST -profile "Runtime For SAP AS"
```
4. Log on as the <sapsid>adm user.

⚠ Caution

Make sure that you log on from the beginning, because the environment of <sapsid>adm has been changed.

5. Restart the SAP instance:


```
startsap r3
```
 6. If you stopped other SAP MaxDB instances, restart them.
- **Your Client is Running on Windows**
 1. Log on as a user with administrator rights.
 2. Stop the primary application server instance and additional application server instance(s).
 3. Stop the server for Remote SQL:


```
x_server stop
```
 4. Start the client software upgrade with the SAP liveCache DVD or with the downloaded software from the Software Distribution Center (SWDC):
 - SAP liveCache DVD


```
<SAP liveCache DVD>:\LC_UPDATE\LCUPDATE.BAT -s <SAPSID> -client
```
 - SWDC


```
SDBINST -profile "Runtime For SAP AS"
```
 5. Log on again as a user with administrator rights.

i Note

Make sure that you log on from the beginning because the user environment has been changed.

6. Restart the SAP instance service `SAP<SID>_<instance number>`.
 7. Start the SAP instance using the Microsoft Management Console.
 8. If you stopped other SAP MaxDB instances, restart them and also restart the server for Remote SQL using the following command:








```
x_server start
```
- **Your Client is Running on IBM i**
 1. Log on as the <sapsid>ADM user.
 2. Stop the primary application server instance or additional application server instance(s) by entering this command:


```
STOPSAP
```
 3. Log on as user QSECOFR.
 4. Switch to the PASE shell by entering this command:


```
CALL QP2TERM
```


5. Start the client software upgrade with the SAP liveCache DVD or with the downloaded software from the Software Distribution Center (SWDC):
 - o SAP liveCache DVD
 - `<SAP liveCache DVD>/DATA_UNITS/LC_UPDATE/LCUPDATE.SH -client`
 - o SWDC
 - `SDBINST -profile "Runtime For SAP AS"`
 6. Log on as the `<sapsid>ADM` user.
 7. Restart the SAP instance by entering this command:
 - `STARTSAP`
 8. If you stopped other SAP MaxDB instances, restart them.
5. If you are performing an upgrade with the SAP SCM extract/load [upgrade strategy \[page 8\]](#), follow the SAP SCM upgrade documentation and section C of report /SAPAPO/OM_LC_UPGRADE_70. There you can find descriptions of when to restart SAP liveCache and when to perform a complete SAP liveCache backup.
 6. If you are performing an upgrade with the Inplace [upgrade strategy \[page 8\]](#):
 - a. Start the server for Remote SQL using the command `x_server start`.
 - b. If you need to import a new SAP liveCache version as part of the SAP liveCache upgrade, do this now.

You can find the newest versions of SAP liveCache at:

<https://launchpad.support.sap.com/#/softwarecenter>  [Support Packages & Patches](#)  [By Alphabetical Index \(A-Z\)](#)  [S](#)  [SAP SCM](#)  [SAP SCM ENHANCE PACKAGE](#)  [<Release> FOR SAP SCM 7.0](#) [Entry by Component](#) [SAP LiveCache](#) [SAP LC/LCAPPS 10.0](#) [<OS>](#)
 - c. Start the SAP SCM and SAP liveCache instances using transaction LC10.
 - d. Perform a complete backup of the SAP liveCache data so that you can recover the new SAP liveCache if necessary.

5.2 Setting Up a liveCache Super User

You need to create a liveCache and liveCache applications super user for liveCache administration. Assign the roles `SAP_APO_LC_ALL` or `SAP_LCA_ALL` and `SAP_BC_LVC_SUPERUSER` to the user, as these roles already contain all required privileges

If you want to create users with limited privileges for transaction LC10, see SAP Note [452745](#)  for more information about the authorization concept for transaction LC10.

5.3 Installing or Upgrading Database Studio for SAP MaxDB

This section describes how to install or upgrade Database Studio for SAP MaxDB and SAP liveCache. Database Studio is the database administration tool for SAP MaxDB. With Database Studio you can administer MaxDB databases version 7.6 and newer.

Prerequisites

- You can install Database Studio on Linux or Windows in your network, even if your database runs on a different operating system. You can then remotely administer the database on a different host. The instructions below refer mainly to the Windows version.

Note

To run Database Studio on Linux, you need to meet the requirements for the SAP MaxDB database server.

- Your PC must meet the following **minimum** requirements:

- Software requirements:

Operating System Requirements for Database Studio 7.9

Operating System	Database Studio 7.9.08	Database Studio 7.9.09
Windows 2008	X64	X64
Windows 2008 R2	X64	X64
Windows Vista	IA32 and X64	X64
Windows 7	IA32 and X64	X64
Windows 8	IA32 and X64	X64
Windows 10	IA32 and X64	X64

- Hardware requirements:
 - RAM: 512 MB (recommended RAM: 1 GB)
 - Processor speed: 1.5 GHz
 - Free disk space: 200 MB
 - Monitor: 1024x768 pixels, 256 colors

- You can obtain the required files by downloading them from:

<https://launchpad.support.sap.com/#/softwarecenter> > Databases > SAP MaxDB > Database Patches > MAXDB GUI COMPONENTS/TOOLS > MAXDB DATABASE STUDIO 7.9 >

- Database Studio 7.9.09 comes with the SAP Java Runtime SAPJVM. You no longer need to download the Java runtime.

- Database Studio 7.9.08 is still available for downloading.
To check your Java version, enter the following command:
`java -version`
To download Java, go to <http://java.com/en/download> .

Context

For more information about Database Studio, see <https://help.sap.com/maxdb/<Version>> *Application Help* > *SAP MaxDB Library* > *Tools* > *Database Studio* .

i Note

Database Studio replaces Database Manager GUI and SQL Studio, which were available in previous releases.

The use of Database Studio for SAP liveCache is optional. If you do not want to use it, skip this section.

For up-to-date information about installing Database Studio, see SAP Note [1097311](#) .

For more information about Database Studio, including troubleshooting, see SAP Note [1097311](#) and [1795588](#) .

Procedure

1. Start the installation or upgrade by simply executing the downloaded `SDBSETUP.EXE` (Windows clients) or `SDBSETUP` (Linux clients) file.
The *Installation Manager* starts.
2. Follow the Installation Manager steps to install or upgrade Database Studio.
3. If you are prompted to restart your computer after the installation, make sure that you first shut down any databases that are running.

6 Additional Information

6.1 Operating Information for liveCache

If you manually reinitialize liveCache with transaction LC10, make sure that you **first delete all administration reports**, especially /SAPAPO/DELETE_LC_ANCHORS and SLCA_INIT_FOLLOW_UP, from the definition of the logical liveCache LCA connection.

6.2 Secure Sockets Layer Protocol for Database Server Communication

The SAP MaxDB database server supports the Secure Sockets Layer (SSL) / Transport Layer Security (TLS) protocol. You can use this protocol to communicate between the database server and its client, here the Application Server (AS).

SSL guarantees encrypted data transfer between the SAP MaxDB database server and its client applications. In addition, the server authenticates itself to the client. You need to install SAP's cryptographic library - SAPCRYPTOLIB. For more information on software versions, see SAP Note [2243688](#).

Caution

There is a performance cost for SSL since the data has to be encrypted, which requires time and processing power.

To use SSL you need to [install the SAP Cryptographic Library \[page 19\]](#) and [generate the personal security environment \[page 20\]](#) (PSE) on the server (SSL Server PSE) and on the client (SSL Client PSE). In addition, you need to [configure the SSL communication between the application server and the database server \[page 23\]](#).

Related Information

[Installing the SAP Cryptographic Library \[page 19\]](#)

[Generating the Personal Security Environment \[page 20\]](#)

[Configuring the SSL Communication between the Application Server and the Database Server \[page 23\]](#)

6.2.1 Installing the SAP Cryptographic Library

This section describes how to install the SAP Cryptographic Library.

Prerequisites

Prerequisites

Download the appropriate installation package for your operating system and liveCache version from:

<https://launchpad.support.sap.com/#/softwarecenter> ► Support Packages & Patches ► SAP TECHNOLOGY COMPONENTS ► SAPCRYPTOLIB ► COMMONCRYPTOLIB <version> ►

Context

The SAP Cryptographic Library supplies the cryptographic functions required to build a database server-client connection using the Secure Sockets Layer (SSL) protocol. Therefore, you need to install the SAP Cryptographic Library on the host machine of the SAP MaxDB database server and the SAP Application Server (AS).

The installation package consists of the following:

- The SAP Cryptographic Library:
 - SAP liveCache >= 7.9.09: CommonCryptoLib (CCL)
 - SAP liveCache < 7.9.09: SAPCRYPTOLIB
- Configuration tool `sapgenpse.exe`

The installation package is called `SAPCRYPTOLIBP_<patch_level>-<platform_id>.SAR`. For example, CCL 8.4.45 on 64-bit AIX is called `SAPCRYPTOLIBP_8445-20011699.SAR`.

For more information on the CCL, see SAP Note [1848999](#).

You use the configuration tool to generate key pairs and PSEs.

Procedure

1. Unpack the installation package for the SAP Cryptographic Library using `sapcar.exe`, which you can find for example on your installation master media, using the following command:

```
sapcar -xvf <name of your package>
```

i Note

The remainder of the procedure (as described below) does not apply to client applications such as SQL Studio, which do not recognize an **independent** directory. In this case, you must copy the `sapcrypto` installation package to the installation directory of the application

2. Copy the `sapcrypto` library to the `lib` subdirectory of the **independent program** directory.

You can find the value of the independent program directory by entering the following command:

```
dbmcli dbm_getpath IndepProgPath
```

Example

The independent program directory might be called the following:

```
/sapdb/programs/lib
```

3. Copy the configuration tool `sapgenpse.exe` to the directory `<independent program>\lib`.
4. Create a subdirectory called `sec` under the **independent data** directory.

Example

The result might look as follows:

```
/sapdb/data/sec
```

5. Make sure that the directory and the files that the `sec` directory contains – including the SSL Server PSE – belong to the user `lcown` and the group `lcadm`, and that the rights are restricted to `0660`.

6.2.2 Generating the Personal Security Environment

This section describes how to generate the SSL Server PSE and the SSL Client PSE.

Context

The information required by the database server or client application to communicate using Secure Sockets Layer is stored in the Personal Security Environment (PSE). The required information differs according to whether SSL PSE is for the server or client:

- **SSL Server PSE**
This PSE contains the security information from the database server, for example, the public-private cryptographic key pair and certificate chain. To install the SSL Server PSE, you need to generate the PSE. You can either do this for a single database server or system-wide. The SSL Server PSE is called `SDBSSLS.exe`.
- **SSL Client PSE**
The client requires an anonymous certificate called `SDBSSLA.exe`, which contains the list of the public keys of trustworthy database servers.

Procedure

1. You [generate the SSL Server PSE \[page 21\]](#)
2. You [generate the SSL Client PSE \[page 22\]](#)

6.2.2.1 Generating the SSL Server PSE

Proceed as follows to generate the SSL Server PSE.

Context

i Note

You need to know the naming convention for the distinguished name of the database server. The syntax of the distinguished name, which you enter in the procedure below, depends on the Certification Authority (CA) that you are using.

Procedure

1. Change to the `<global programs>\lib` directory.
2. Set up the following environment variable:
`SECUDIR=<global data>\sec`
3. Enter `<global program>/lib` in the environment variable `LD_LIBRARY_PATH`.
4. Create a SSL Server PSE, `SDBSSLS.pse`, and generate a certificate request file, `certreq`, in the directory defined by `SECUDIR` (see step 2):

```
sapgenpse gen_pse -v -r <SECUDIR>\certreq -p SDBSSLS.pse "<your distinguished name>"
```

For each database server that uses a server-specific PSE, you must set up a unique certificate request. If you are using a valid system-wide SSL Server PSE, you only need to set up a single certificate request for all servers.

5. Send the certificate request to the CA for signing. You can either send it to the SAP CA or to another CA.
You must make sure that the CA offers a certificate corresponding to the PKCS#7 certificate chain format. Thawte CA at the Thawte website offers a suitable certificate, either SSL Chained CA Cert or PKCS#7 certificate chain format.
The CA validates the information contained in the certificate request, according to its own guidelines, and sends a reply containing the public key certificate.
6. After you have received the reply from the CA, make sure that the contents of the certificate request have not been destroyed during download.

For example, if you requested the certificate on a UNIX system and stored it on a Windows front end, the formatting (that is, line indents and line breaks) is affected.

To check the contents, open the certificate request with a text editor (such as Notepad) and repair the line indents and the line breaks.

❖ Example

This is an example of a certificate request:

⇐ Sample Code

```
-----BEGIN CERTIFICATE REQUEST-----
MIIBPzCBqQIBADAAMIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQD/302IT+/Y
wpignSw7U9FWneyWz3Wil0S18aFCYkRo00wCpD8UwcaC4dds4uGT6hl2WlJ0/FOtUg
+EQxonZbaRrk9sTalknlmqx3YAUe/gEaGdf1wvuYkb0gjMk8liM/
jb9BJd8srMPyoBy9jMC7v5u7+TZWmWa6RjnvClvYGgMwIDAQABoAAwDQYJKoZIhvcNAQEFBQ
ADgYEA
x2zuaTAOKPdGmxUKYlWdasUpim4vhfaHa7ZDBwipvKJ8akYCT
+dpmVjhcp9E7cUjL80/6Rup5cnLAAO5FhVt5MS6zNJa9YYSN9XP+5/
MPF6Q4ayJ0VryTkSpbbPrWlBKh1Dds97LQVuQ/myKIAHECwyW6t7sAFJWn4P0fdxmKo=
-----END CERTIFICATE REQUEST-----
```

7. Import the reply to the SSL Server PSE:

- Copy the text to a temporary file called `srcert`.
- Enter the following command:

```
sapgenpse import_own_cert -c srcert -p SDBSSL.S.pse
```

You have generated the SSL Server PSE. You can now start the XServer as usual (if it is already running, you must stop and restart it).

8. To check whether the SSL functionality is working correctly, view the trace file `niserver_<local computer name>.trace` in the `<global data>\wrk` directory.

6.2.2.2 Generating the SSL Client PSE

Proceed as follows to generate the SSL Client PSE.

Procedure

- Change to the `<global programs>\lib` directory.
- Set up the following environment variable:
`SECUDIR=<global data>\sec`
- Enter `<global program>/lib` in the environment variable `LD_LIBRARY_PATH`.
- Create an anonymous client SSL Client PSE, `SDBSSLA.pse` in the directory defined by `SECUDIR` (see previous step):

```
sapgenpse gen_pse -v -noreq -p SDBSSLA.pse
```

You can leave the distinguished name empty.

Before you can establish an SSL connection to a database server, the server certificate must be entered in the PK list of the anonymous client certificate.

- To see the database server certificate, enter the following command:

```
„x_ping -n <servermode> -c[apture]
```

You can check whether to trust the database server certificate. The client certificate is not affected by this.

6. Start the import with this command:

```
„x_ping -n <servermode> -i[import]
```

7. To administer the PSE, use the configuration tool `sapgenpse`. For more information, enter the following command:

```
sapgenpse -h
```

i Note

For applications such as SQL Studio replace the global data or global program in the above description with the relevant installation directory.

6.2.3 Configuring the SSL Communication between the Application Server and the Database Server

Set the connection information for each database connection for which SSL is to be used.

Procedure

Using transaction `dbco`, set the connection information for each database connection for which SSL is to be used as follows:

- Connection information for database connection `<name>`
`maxdb:remotes://<host>/database/<SID>-<SID>`
- Connection information for database connection `<name>+`
`@DBM_SSL:<host>-<SID>`

For more information, see SAP Note [2190094](#).

Example

Database connection: `Test`

```
<host>: 1u12345
```

```
<SID>: WB9
```

Connection information for database connection `Test`:

```
maxdb:remotes://1u12345/database/WB9-WB9
```

Connection information for `Test+`:

```
@DBM_SSL:1u12345-WB9
```

6.3 Database Directory Structure

You can set up several database instances with different releases in one user environment. For this the database services are split into the following areas.

i Note

As of SAP MaxDB version 7.8, with the introduction of the isolated installation, the database directory structure in SAP installations has changed. This section describes the new structure.

- **Global programs path: `GlobalProgPath`**

This area contains all services that are only allowed to exist once per computer and are downward compatible (for example, installation tools and the global listener, `sdbgloballistener`). Therefore, only programs of the most recent installed version exist here.

You can check the path for `GlobalProgPath` with the following `dbmcli` command:

```
dbmcli dbm_getpath GlobalProgPath
```

By default, `GlobalProgPath` is set as follows for the installation:

```
/sapdb/programs
```
- **Global data path: `GlobalDataPath`**

This area contains all data necessary for an instance with version 7.7 or lower, including run directories and their parameter files. The directory containing this data is called the `GlobalDataPath`.

You can check the path for `GlobalDataPath` with the following `dbmcli` command:

```
dbmcli dbm_getpath GlobalDataPath
```

By default, `GlobalDataPath` is set as follows for the installation:

```
/sapdb/data
```
- **Private data path: `PrivateDataPath`**

This area contains all data necessary for an instance with version 7.8 or higher, including run directories and their parameter files. The directory containing this data is called the `PrivateDataPath`.

You can check the path for `PrivateDataPath` with the following `dbmcli` command:

```
dbmcli -s inst_enum <InstallationPath>
```

By default, `PrivateDataPath` is set as follows for the installation:

 - SAP MaxDB server software installations:

```
/sapdb/<DBSID>/data
```
 - SAP MaxDB client software installations:

```
/sapdb/clients/<SAPSID>/data
```
- **Installation path: `InstallationPath`**

This area contains all programs necessary for a running database instance or for client software.

InstallationPath of server software (for a database instance):

The programs must all correspond to the instance version and are installed once per instance. The programs include, for example, `kernel`, `console`, `dbmsrv`, and so on. The storage location is known as the `InstallationPath` of the instance.

InstallationPath of a client software:

This area contains shared libraries and DLLs required by SAP clients at runtime connecting to database instances of version 7.8 or higher, including SQLDBC, JDBC, ODBC, and so on. The client software is installed on each computer, for each SAP instance separately.

The installation sets up the directory as follows:

 - SAP MaxDB server software installations:

```
/sapdb/<DBNAME>/db
```


- SAP MaxDB client software installations:

`/sapdb/clients/<SAPSID>`

You can display instance names and the associated `InstallationPath` on a computer with the following `dbmcli` command:

```
dbmcli db_enum
```

You can display the `InstallationPath` of installed software on a computer with the following `dbmcli` command:

```
dbmcli inst_enum
```

6.4 Log Files for Troubleshooting

This section provides information about how you can find log files relevant for the upgrade and the associated software installation.

All steps of the upgrade and the associated software installation are logged in the file with the following name:

```
/var/tmp/SDBUPD.log
```

If the directory `<independent_data_path>` is not known at the time of failure, the log is written to the current directory.

i Note

If you are updating the SAP MaxDB client software, you can find the log files here instead:



```
/var/tmp/SDBINST.log
```

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