SAP HANA Installation Guide with SAP HANA Unified Installer

- SAP HANA Appliance Software SPS 03

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Contents

Installing SAP HANA Overview

This SAP HANA installation guide describes how to install SAP HANA with the SAP HANA unified installer. Before starting the installation of SAP HANA, make sure that you have read the SAP HANA Master Guide.

1.1 Software Components

SAP HANA appliance software is available in different editions:

- SAP HANA appliance software platform edition
- SAP HANA appliance software enterprise edition
- SAP HANA appliance software enterprise extended edition

Components	Platform	Enterprise	Extended
SAP HANA database	x	x	x
SAP HANA studio	x	x	x
SAP HANA client	x	x	x
SAP Host Agent 7.20	x	x	x
SAP HANA information composer	x	x	x
LT Replication AddOn		x	x
LT Replication Server		x	x
SAP BusinessObjects Data Services 4.0		x	x
Sybase Adaptive Server Enterprise (ASE) 15.5			x
Sybase Replication Server 15 (incl. ECDA)			x
Sybase Replication Server Agent 15			x
SAP HANA load controller			x

The **SAP HANA appliance software platform edition** is intended for customers who want to use the ETL-Based Replication and already have a license for SAP BusinessObjects Data Services. It comprises the following components:

- SAP HANA database
- SAP HANA studio
- SAP HANA client

- SAP Host Agent 7.20
- SAP HANA information composer

The **SAP HANA appliance software enterprise edition** is intended for customers who want to use either Trigger-Based Replication or ETL-Based Replication and do not already have all necessary licenses for SAP BusinessObjects Data Services. It comprises the following components:

- SAP HANA database
- SAP HANA studio
- SAP HANA client
- SAP Host Agent 7.20
- SAP HANA information composer
- LT Replication AddOn
- LT Replication Server
- SAP BusinessObjects Data Services 4.0

The **SAP HANA appliance software enterprise extended edition** is intended for customers who want to use the full potential of all available replication scenarios including the Log-Based Replication. It comprises the following components:

- SAP HANA database
- SAP HANA studio
- SAP HANA client
- SAP Host Agent 7.20
- SAP HANA information composer
- LT Replication AddOn
- LT Replication Server
- SAP BusinessObjects Data Services 4.0
- Sybase Adaptive Server Enterprise (ASE) 15.5
- Sybase Replication Server 15 (incl. ECDA)
- Sybase Replication Server Agent 15
- SAP HANA load controller

Note:

- The Software Update Manager (SUM) for SAP HANA is installed by the SAP HANA unified installer together with other SAP HANA components. For a list of components, see SAP HANA Installation Guide, section "Installed SAP HANA Components and Directories". The Software Update Manager (SUM) for SAP HANA is part of the Software Logistics Toolset (SL Toolset).
- SAP HANA information composer is a Web-based environment which allows business users to upload data to the SAP HANA database and to manipulate that data by creating Information Views.

The SAP HANA information composer is installed separately from the SAP HANA system. For more information, see SAP HANA Information Composer – Installation and Configuration Guide.

1.2 Software Download

The components of SAP HANA can only be installed by certified hardware partners on validated hardware running a specific operating system. Any other system or content developed with such systems is not supported by SAP. For more information, see the information page of the product version. Support Package Stacks (SPS) can be downloaded and applied to appliances according to agreements with the respective hardware partner.

1.3 Hardware and Software Requirements

Note:
You can find the complete list of all SAP HANA components and the respective SAP HANA hardware and software requirements in the Product Availability Matrix (PAM) on SAP Service Marketplace at https://service.sap.com/pam.

Software Requirements

Operating System for SAP HANA

SUSE Linux Enterprise Server (SLES) 11 SP1 – see SAP Note 1310037 for information about installing SLES 11 SP1 in an SAP environment

Note:
Only the software installed by your hardware partners is recommended on the SAP HANA box. Do not install additional software on the SAP HANA box.

Hardware Requirements

Hardware Requirements for SAP HANA Network Connection

SAP recommends a dedicated server network communication of 10 GBit/s between the SAP HANA landscape and the source system for efficient data replication.

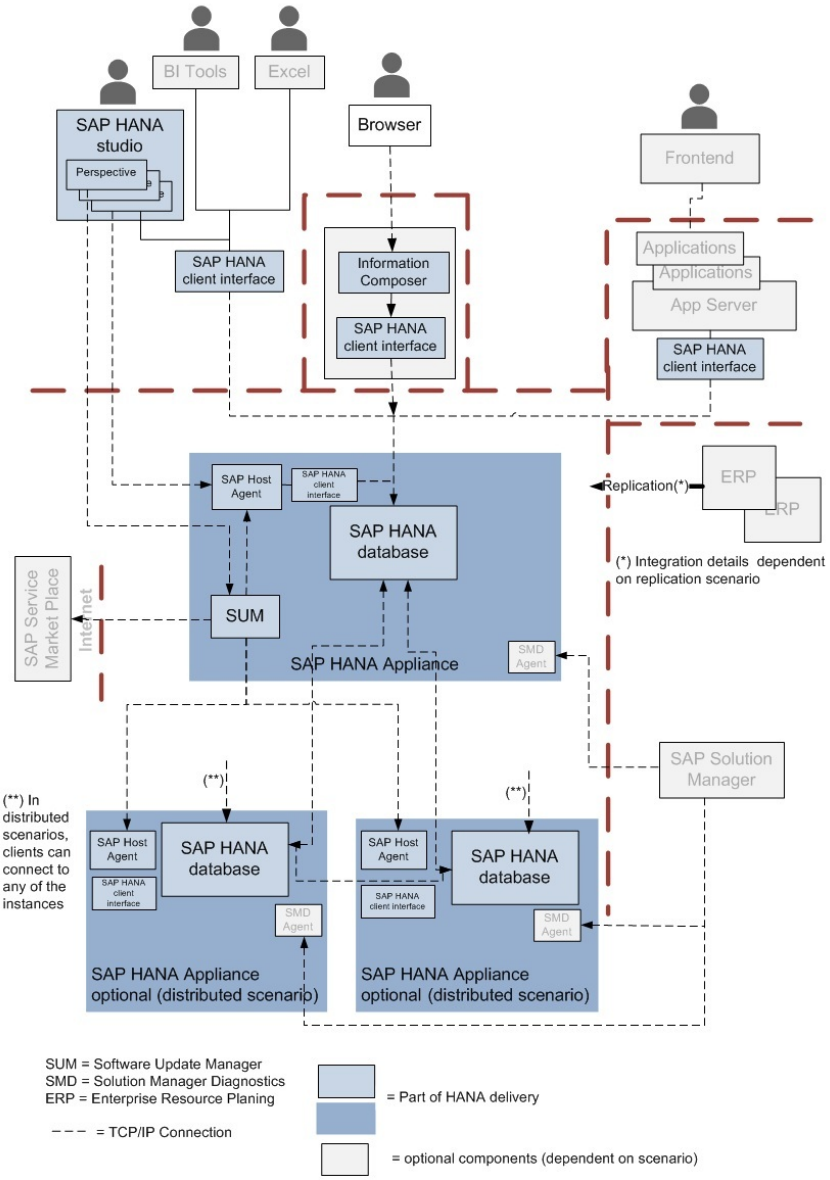
1.4 SAP HANA Guides

For more information about SAP HANA landscape, security, installation, and administration, see the resources listed below:

Topic	Location	Quick Link
SAP HANA landscape, deployment, and installation	SAP HANA Knowledge Center on SAP Service Marketplace	https://service.sap.com/hana: • SAP HANA Master Guide • SAP HANA Installation Guide • SAP HANA Information Composer – Installation and Configuration Guide
SAP HANA administration and security	SAP HANA Knowledge Center on SAP Help Portal	http://help.sap.com/hana_appliance: • SAP HANA Technical Operations Manual • SAP HANA Security Guide • SAP HANA Automated Update Guide

1.5 Technical System Landscape

The figure below shows an overview of the technical system landscape for the SAP HANA appliance software and its related components, such as the SAP HANA studio and other applications, one of which is the SAP HANA Information Composer. Note that the figure below shows a sample configuration with three SAP HANA appliances and three SAP HANA databases. The figure also shows some optional components that must be purchased separately.


BI Tools
Excel
Browser
SAP HANA studio
Perspective
Frontend
SAP HANA client interface
Information Composer
SAP HANA client interface
Applications
Applications
App Server
SAP HANA client interface
SAP Host Agent
SAP HANA client interface
SAP HANA database
Replication(*)
ERP
ERP
(*) Integration details dependent on replication scenario
SAP Service Market Place
Internet
SUM
SAP HANA Appliance
SMD Agent
SAP Solution Manager
(**) In distributed scenarios, clients can connect to any of the instances
(**)
(**)
SAP Host Agent
SAP HANA client interface
SAP HANA database
SMD Agent
SAP HANA Appliance optional (distributed scenario)
SAP HANA Appliance optional (distributed scenario)
SUM = Software Update Manager
SMD = Solution Manager Diagnostics
ERP = Enterprise Resource Planing
= TCP/IP Connection
= Part of HANA delivery
= optional components (dependent on scenario)

Running SAP HANA Unified Installer

The SAP HANA unified installer is a tool to install the SAP HANA appliance software in a single, unified and predefined way. It is targeted to be used by the SAP HANA hardware partners within their factory process.

Related Topics

- Performing a Distributed System Installation (Optional)
- Preparation
- Running the Installer
- Post-Installation

2.1 Performing a Distributed System Installation (Optional)

You want to install your SAP HANA system as a distributed system, that is, a system distributed over several hosts.

Procedure

1. Familiarize yourself with the concept of a distributed system by reading *Distributed System* and *Installation Planning* in the SAP HANA Database - Server Installation and Update Guide .
2. Determine and create mount points on all hosts on which you want to install SAP HANA instances, as described in *Pre-Installation Steps* in the SAP HANA Database - Server Installation and Update Guide .
3. When you prepare the installer configuration file, ensure that the `sapmntPath` parameter is set to the path of the mount points from the previous step. For more information, see Preparing the Installer Configuration File .
4. On the central host, run the SAP HANA unified installer as described in Running the Installer.
5. Add the required hosts as described in Adding a Host to the System in the SAP HANA Database - Server Installation and Update Guide .

Related Topics

- Installation Parameters
- Preparing the Installer Configuration File
- Running the Installer

2.2 Preparation

You have to perform the preparation steps described in the following sections to be able to run SAP HANA unified installer:

Related Topics

- Required File Systems and Directories
- Installation Parameters
- Users Created During the Installation
- Required Installation Media
- Preparing the Installer Configuration File

2.2.1 Required File Systems and Directories

The installer requires the file systems listed in the table below. All directories and files of the SAP system to be installed are created in these file systems.

If you have created these file systems in the appropriate partition before you start the installation, the installer recognizes `/sapmnt` and `/usr/sap` during the installation and automatically creates the directories and files of the SAP system there.

If you have not created these file systems before you start the installation, the installer creates them by default in the root directory (`/`) of the main partition along with the directories and files of the SAP system.

The directories for data- and log-volumes are not created automatically by the installer. You must create them manually before you start the installation.

Table 2-1: Required File Systems

File System	Description	Required Minimum Disk Space
/	The root partition	32 GB

File System	Description	Required Minimum Disk Space
/<sapmnt>	The file system for the SAP mount directory for global files and profiles The default name for the SAP mount directory is sapmnt, however you can also specify another name. It must be physically shared. The path to the SAP mount directory is a mandatory parameter to be filled in the installer configuration file. For more information, see Installation Parameters and Preparing the Installer Configuration File.	5 GB
/usr/sap	The file system for local SAP system instance directories	2 GB
/<path>/data	The directory for data-volumes of the SAP HANA system The path to the data directory depends on the configuration of the SAP HANA host. **Note:** You must create this directory manually before your start the installation.	Data partition must be able to write at least 800 MB/s
/<path>/log	The directory for log-volumes of the SAP HANA system The path to the log directory depends on the configuration of the SAP HANA host. **Note:** You must create this directory manually before your start the installation.	Data partition must have a capacity of at least 100,000 I/O ops

Related Topics

- Installation Parameters
- Preparing the Installer Configuration File

2.2.2 Installation Parameters

The installer requires the following parameters:

- Parameters to be inserted in the configuration file
- Parameters to be entered on the command line

Table 2-2: Parameters to be inserted in the configuration file

Parameter ID	Description
sid	The SAP system ID (SAPSID) is the identifier for the SAP HANA system. • The ID must be unique throughout your organization and consistent throughout your SAP system installation landscape. • If you want to install an additional application server instance, make sure that no gateway instance with the same SAPSID exists in your SAP system landscape. • The ID must consist of exactly three alphanumeric characters. Only uppercase letters are allowed. The first character must be a letter (not a digit). • The following IDs are reserved and cannot be used: ADD ALL AMD AND ANY ARE ASC AUX AVG BIT CDC COM CON DBA END EPS FOR GET GID IBM INT KEY LOG LPT MAP MAX MIN MON NIX NOT NUL OFF OLD OMS OUT PAD PRN RAW REF ROW SAP SET SGA SHG SID SQL SUM SYS TMP TOP UID USE USR VAR.
instancenr	The instance number of the SAP HANA system An instance is an administrative unit that comprises the server software components. It is started and stopped as a unit. The instance number is a technical identifier for internal processes, and consists of a two-digit number between 00 and 97.

Parameter ID	Description
sapmntPath	The path to the SAP mount directory The SAP mount directory can be used as a shared directory between multiple hosts. The installer sets sapmntPath to `/sapmnt` by default. Ensure that the required file system is available on the installation host. For more information, see Required File Systems and Directories. If you want to install your SAP HANA system as a system distributed over several hosts, you have to set the `sapmntPath` to the path of the mount points on all hosts on which you want to install SAP HANA instances. For more information, see Performing a Distributed System Installation (Optional).
dataPath	The path to the data directory of the SAP HANA system We recommend that you name this directory `/data`. The path to the `data` directory depends on the configuration of the SAP HANA host. It is a mandatory parameter to be filled in the installer configuration file. For more information, see Installation Parameters and Preparing the Installer Configuration File. **Note:** You must create this directory manually before your start the installation (see also Required File Systems and Directories).
logPath	The path to the log directory of the SAP HANA system We recommend that you name this directory `/log`. The path to the `log` directory depends on the configuration of the SAP HANA host. It is a mandatory parameter to be filled in the installer configuration file. For more information, see Installation Parameters and Preparing the Installer Configuration File. **Note:** You must create this directory manually before your start the installation (see also Required File Systems and Directories).

Parameter ID	Description
hdbHost	The fully qualified host name of the SAP HANA system Make sure that a fully qualified host name is assigned to the local machine, that is, the SAP HANA host. For more information about the restrictions that apply to host names in SAP systems, see SAP Note 611361 - Hostnames of SAP servers.

Table 2-3: Parameters to be entered on the command line

Parameter	Description
master password	Common password for all users that are created during the installation (see also Users Created During the Installation) The master password must meet the following requirements: • It must consist of at least eight characters • It must contain at least one lowercase character, one uppercase character, and one number. The master password is verified by the installer. It is prompted on the command line while you are running the installer.

Related Topics

- Performing a Distributed System Installation (Optional)
- Required File Systems and Directories
- Users Created During the Installation

2.2.3 Users Created During the Installation

The following users are automatically created during the installation. All these users are assigned the master password:

User	Description
<sapsid>adm	The system administrator, `<sapsid>adm` is the operating system user required for administrative tasks such as starting and stopping the system. The user ID and password of the `<sapsid>adm` user are defined during the system installation. The user ID and group ID of this operating system user must be unique and identical on each host of a distributed system.
sapadm	The SAP Host Agent administrator If there is no SAP Host Agent available on the installation host, it is created during the installation along with user `sapadm`. If the host agent is already available on the installation host, the installer neither modifies the host agent, nor its `sapadm` user, nor the `sapadm` user's password.

User	Description
SYSTEM	The database superuser user Initially, the `SYSTEM` user has all system permissions. Additional permissions can be granted to this user or revoked. However, only those permissions can be revoked that were granted in addition to to the initial permissions.

2.2.4 Required Installation Media

The following installation medium is required. Make sure that the software contained in the relevant folders is available on the installation host:

Medium	Folders
SAP HANA PLATFORM EDITION	`HANA_IM_LINUX__X86_64` Contains the installation master **Note:** You can also download the installation master separately as a ZIP file from SAP Service Marketplace.
	`HDB_SERVER_LINUX_X86_64` Contains the SAP HANA database software
	`HDB_CLIENT_LINUX_X86_64` Contains the SAP HANA database client software
	`HDB_STUDIO_LINUX_X86_64` Contains the SAP HANA studio repository software
	`SAP_HOST_AGENT_LINUX_X64` Contains the SAP Host Agent software
	`SUM4HANA` Contains the SUM for SAP HANA deployment archive

Related Topics

- Installation Parameters
- Software Download

2.2.5 Preparing the Installer Configuration File

Prerequisites

Make sure you have done the following before you start preparing the installer configuration file:

- You have set up the required file systems and directories. For more information, see Required File Systems and Directories
- You have specified installation parameters. For more information, see Installation Parameters.
- You have made the required installation media available. For more information, see Required Installation Media.

Procedure

1. Copy the file `setuphana.slmodel.template`, which is available in the `HANA_IM_LINUX__X86_64` folder on the installation medium, to a local directory. Note that the target file must only have the extension `.slmodel`:

   Example:

   ```
   cp /mnt/HANA_DVD/DATA_UNITS/HANA_IM_LINUX_X86_64/setuphana.slmodel.template /tmp/setuphana.slmodel
   ```

2. Edit the `setuphana.slmodel` file and insert the required installation parameters by filling in all empty fields marked with ${...}:
   - Insert the path to the data directory for the SAP HANA system :

     ```
     <StringParameter name="dataPath" value="${DATAPATH}"/>
     ```

     Example: `<StringParameter name="dataPath" value="/data"/>`

     Note:
     You must create this directory manually before your start the installation. For more information, see Required File Systems and Directories.

   - Insert the path to the log directory for the SAP HANA system :

     ```
     <StringParameter name="logPath" value="${LOGPATH}"/>
     ```

     Example: `<StringParameter name="logPath" value="/log"/>`

     Note:
     You must create this directory manually before your start the installation. For more information, see Required File Systems and Directories.

   - Insert the path to the SAP mount directory for the SAP HANA system:

     ```
     <StringParameter name="sapmntPath" value="/sapmnt"/>
     ```

     sapmntPath is set to `/sapmnt` by default. However, you can also specify another directory as SAP mount directory, according to your requirements.

     Note:
     You must specify this parameter if you want to install a distributed system. For more information, see Performing a Distributed System Installation (Optional).

   - Insert a valid instance number for the SAP HANA system:

     ```
     <StringParameter name="instancenr" value="${INSTANCENUMBER}"/>
     ```

     Example: `<StringParameter name="instancenr" value="02"/>`
   - Insert a valid SAP system ID (SAPSID):

     ```
     <StringParameter name="sid" value="${SID}"/>
     ```

     Example: `<StringParameter name="sid" value="HAN"/>`
   - Insert the fully qualified host name of the SAP HANA system:

     ```
     <StringParameter name="hdbHost" value="${HDBHOST}"/>
     ```

     Example: `<StringParameter name="hdbHost" value="wdflbmd0327.wdf.sap.corp"/>`

You have prepared the `setuphana.slmodel` file.

You can now start the installer.

Related Topics

- Performing a Distributed System Installation (Optional)
- Required File Systems and Directories
- Required Installation Media
- Installation Parameters

2.3 Running the Installer

Prerequisites

Make sure you have done the following before you start the installer:

- You have made the installation media available. For more information, see Required Installation Media.
- You have specified the required installation parameters. For more information, see Installation Parameters.
- You have prepared the installer configuration file. For more information, see Preparing the Installer Configuration File.
- You have specified a `<WORKING_DIRECTORY>` for the installer. For more information, see Required File Systems and Directories

  Example:

  ```
  /tmp/hanainst
  ```

  Make sure that the `<WORKING_DIRECTORY>` meets the following requirements:

  - It has at least 200 MB of free disk space.
  - It is empty before you start or restart the installer.

Procedure

1. Log on to the installation host as a user with `root` authorizations.
2. Start the installer in one of the following ways:
   - To run the installer from the installation medium, proceed as follows:
     a. Change to the directory `HANA_IM_LINUX__X86_64` on the installation medium where the `setup.sh` script is located.
     b. Start the installer from the command line by entering the following command:

        ```
        ./setup.sh <WORKING_DIRECTORY> <MODEL_FILE>
        ```

        where `<WORKING_DIRECTORY>` is the path to the directory to which the installer is to be unpacked and `<MODEL_FILE>` is the path to the installer configuration file.

Example:

```
./setup.sh /tmp/hanainst /tmp/setuphana.slmodel
```

- To run the installer from the downloaded installer ZIP file, proceed as follows:
  a. Change to the directory to which you have unpacked the installer ZIP file.
  b. Start the installer from the command line by entering the following command:

     ```
     ./setup.sh -d <MEDIUM_LOCATION> <WORKING_DIRECTORY> <MODEL_FILE>
     ```

     where `<MEDIUM_LOCATION>` is the path to the installation medium, `<WORKING_DIRECTORY>` is the path to the directory to which the installer is to be unpacked, and `<MODEL_FILE>` is the path to the installer configuration file.

     Example:

     ```
     ./setup.sh -d /mnt/HANA_DVD /tmp/hanainst /tmp/setuphana.slmodel
     ```

3. During the installation process, you are prompted to enter and repeat the master password on the command line.

Result:

The installation progress is displayed on the command line.

If the installation is successful, you see the message
`Finished successfully`
at the end of the command line output, and the SAP HANA system is up and running.

Related Topics

- Required Installation Media
- Required File Systems and Directories
- Installation Parameters
- Preparing the Installer Configuration File
- Installed SAP HANA Components and Directories
- Troubleshooting

2.3.1 Installed SAP HANA Components and Directories

Component	Directory	Description
SAP Host Agent	`/usr/sap/hostctrl`	For more information about the host agent and its elements, see SAP Note 1031096 - Installing Package SAPHOSTAGENT

Component	Directory	Description
SAP HANA database	`/usr/sap/<SAPSID>`	Contains the following sub-directories: • `home` The home directory of the `<sid>adm` user • `SYS` Contains system executables • `exe` Contains executable kernel programs • `global` Contains globally shared data • `profile` Contains the profiles of all instances • `lm_structure` Contains the `landscapeDescription.xml` file
SAP HANA client	`/usr/sap/hbdclient`	Only the client on the SAP HANA system, not clients on related SAP ERP systems
SAP HANA studio repository	`/usr/sap/hdbstudio_update`	Only the SAP HANA studio repository is installed (not the complete SAP HANA studio). Developers can use this repository to update their local SAP HANA studio installation.
SUM for SAP HANA	`/usr/sap/<SAPSID>/SUM`	The Software Update Manager (SUM) for SAP HANA downloads new Support Package Stacks (SPS) for SAP HANA from the SAP Service Marketplace (SMP) and updates the components on your SAP HANA system. The automated update is performed with the Software Update Manager (SUM) for SAP HANA , which is part of the Software Logistics Toolset (SL Toolset). SUM for SAP HANA is installed and configured with a default security configuration. For more information, see SUM for SAP HANA Default Configuration .

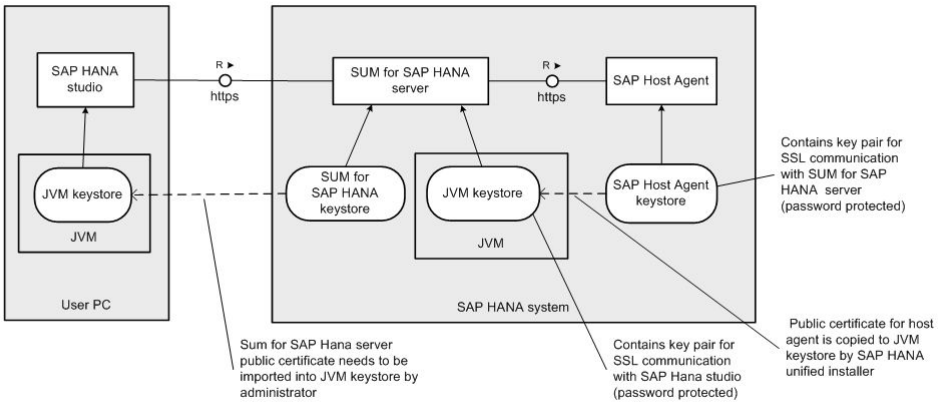
Related Topics

- Configuring the Software Update Manager for SAP HANA

2.3.1.1 SUM for SAP HANA Default Configuration

SUM for SAP HANA is installed and configured with a default security configuration that is ready-to-run. You can use it to minimize configuration effort.

The following graphics outline the default security configuration that the installer provides:



The communication between the SAP HANA studio, SUM for SAP HANA server, and the host agent is done via HTTPS. This communication requires configuration performed by the installer.

Starting on the right of the figure, a keystore named `/usr/sap/hostctrl/exe/sec/SAPSSLS.pse` with a public/private key pair is generated and password protected for the host agent. The SAP Host Agent can read the private key via a special file `/usr/sap/hostctrl/exe/sec/cred_v2`, which contains the keystore password in an encrypted form. The `cred_v2` is only readable for user `sapadm` . The password is generated randomly.

If there is already a keystore for the SAP Host Agent, it is not deleted or modified. An attempt is made to export the certificate so that it can be used by the SUM for SAP HANA server. A password is not required if the `cred_v2` exists. If there is no `cred_v2` file for user `sapadm` the installation aborts.

The public certificate is imported into the keystore of the JVM that is used to run the SUM for SAP HANA server. This keystore is located at `/usr/sap/${SID}/SUM/jvm/jre/lib/security/cacerts`. This keystore has a default password changeit.

The SUM for SAP HANA keystore contains the public/private key pair for the communication with the SAP HANA studio. The keystore password is generated randomly and stored as clear text in the file `/usr/sap/${SID}/SUM/config/catalina.properties` file. This is the same password that is used to protect the SAP Host Agent keystore. Make sure that you do not lose it.

This file is required for the web server to be able to access the private key. The public certificate for the SUM for SAP HANA is exported from the SUM for SAP HANA keystore and stored in the file `/usr/sap/${SID}/SUM/config/sumforhana.cer`. The alias name is `sumforhana_${host name}_${SID}`. This public certificate must be imported into the keystore of the SAP HANA studio.

You still need to finalize the SUM for SAP HANA configuration as described in Configuring the Software Update Manager for SAP HANA.

Example: Contents of the SUM config directory after the installation has finished

```
wdflbmd7674:/usr/sap/S51/SUM/config # ll
total 32
drwxr-xr-x 2 s51adm sapsys 4096 Sep 2 00:30
drwxr-xr-x 23 s51adm sapsys 4096 Sep 2 00:30 .
-r-------- 1 s51adm sapsys 33 Sep 2 00:30 catalina.properties
-rw-r--r-- 1 s51adm sapsys 1238 Sep 2 00:30 keystore.jks
-rw-r--r-- 1 s51adm sapsys 449 Sep 2 00:30 sumforhana.cer
-rw-r--r-- 1 root root 4111 Aug 18 19:21 tomcat-server.xml
```

Related Topics

- Configuring the Software Update Manager for SAP HANA

2.3.2 Uninstall

If required, you can also uninstall the SAP HANA components that have been set up by the installer. You can do this using the `uninstall.sh` script.

Note:
The `uninstall.sh` script does not remove the SAP Host Agent.

Prerequisites

Make sure you have done the following before you start the installer:

- You have made the installation media available. For more information, see Required Installation Media.
- You have specified the required installation parameters. For more information, see Installation Parameters.
- You have prepared the installer configuration file. For more information, see Preparing the Installer Configuration File.
- You have specified a `<WORKING_DIRECTORY>` for the uninstall. For more information, see Required File Systems and Directories

Example:

```
/tmp/hanainst
```

Make sure that the <WORKING_DIRECTORY> meets the following requirements:

- It has at least 200 MB of free disk space.
- It is empty before you start or restart the uninstall.

Procedure

1. Log on to the host on which you want to perform the uninstall as a user with root authorizations.
2. Start the uninstall.sh script in one of the following ways:
   - To run uninstall.sh from the installation medium, proceed as follows:
     a. Change to the directory HANA_IM_LINUX__X86_64 on the installation medium where the uninstall.sh script is located.
     b. Start the installer from the command line by entering the following command:

        ```
        ./uninstall.sh <WORKING_DIRECTORY> <MODEL_FILE>
        ```

        where <WORKING_DIRECTORY> is the path to the directory to which the installer is to be unpacked and <MODEL_FILE> is the path to the installer configuration file.

        Example:

        ```
        ./uninstall.sh /tmp/hanainst /tmp/setuphana.slmodel
        ```

   - To run the installer from the downloaded installer ZIP file, proceed as follows:
     a. Change to the directory to which you have unpacked the installer ZIP file.
     b. Start the installer from the command line by entering the following command:

        ```
        ./uninstall.sh -d <MEDIUM_LOCATION> <WORKING_DIRECTORY> <MODEL_FILE>
        ```

        where <MEDIUM_LOCATION> is the path to the installation medium, <WORKING_DIRECTORY> is the path to the directory to which the installer is to be unpacked, and <MODEL_FILE> is the path to the installer configuration file.

        Example:

        ```
        ./uninstall.sh -d /mnt/HANA_DVD /tmp/hanainst /tmp/setuphana.slmodel
        ```

Result:

The uninstall progress is displayed on the command line.

If the uninstall is successful, you see the message
`Finished successfully`
at the end of the command line output.

Related Topics

- Required Installation Media
- Installation Parameters
- Preparing the Installer Configuration File

- Troubleshooting

2.3.3 Troubleshooting

Prerequisites

The installation or uninstall did not finish with the message `Finished successfully`

Procedure

Check the installation log file as follows:

1. Change to the `<WORKING_DIRECTORY>/log` directory, where `<WORKING_DIRECTORY>` is the path to the directory where the installer has been unpacked.

   Example:

   ```
   /tmp/hanainst/log/install.glf
   ```

2. Open the installation log file `install.glf`.
3. Try to analyze the error.

Caution:
If you need to restart the installation from scratch, make sure that the working directory is empty before your restart the installer.

2.4 Post-Installation

You have to perform the post-installation steps described in the following sections after the SAP HANA unified installer has finished:

Related Topics

- Starting and Stopping the SAP HANA System
- Displaying the Process List
- Logging on to the SAP HANA System Using the SAP HANA Computing Studio
- Ensuring User Security
- Configuring the Software Update Manager for SAP HANA
- Accessing the SAP HANA Studio p2 Repository
- Enabling Automatic Start of the SAP HANA Database
- Applying Updates and Support Packages
- Monitoring the SAP HANA System Landscape

2.4.1 Starting and Stopping the SAP HANA System

After the installation has finished successfully, the SAP HANA system is up and running. So you do not need to start the SAP HANA system.

However, if required, you can start and stop the SAP HANA system from the command line in one of the following ways:

- By using the `sapcontrol` program:
  a. Log on to the SAP HANA system host as a user with `root` authorization.
  b. Execute one of the following commands:
     - Start the SAP HANA system by entering the following command:
       `/usr/sap/hostctrl/exe/sapcontrol -nr <Instance_Number> -function Start`
     - Stop the SAP HANA system by entering the following command:
       `/usr/sap/hostctrl/exe/sapcontrol -nr <Instance_Number> -function Stop`
- By using the `HDB` program:
  a. Log on to the SAP HANA system host as user `<sapsid>adm`.
  b. Execute one of the following commands:
     - Start the SAP HANA system by entering the following command:
       `/usr/sap/<SAPSID>/<Instance_Name>/HDB start`

       Example:

       `/usr/sap/KB1/HDB26/HDB start`
     - Stop the SAP HANA system by entering the following command:
       `/usr/sap/<SAPSID>/<Instance_Name>/HDB stop`

       Example:

       `/usr/sap/KB1/HDB26/HDB stop`

2.4.2 Displaying the Process List

Prerequisites

You are logged on to the SAP HANA host as user `root` .

Procedure

You can display SAP HANA system processes by executing the following commands from the command line:

```
/usr/sap/hostctrl/exe/sapcontrol -nr <instancenr> -function GetProcessList
```

Note:
You can also display the SAP HANA system processes using the SAP Microsoft Management Concole (SAP MMC) from a Windows PC.

Example: Displaying the Process List

```
wdflbmd0417:/mnt/HANA_DVD/DATA_UNITS/HANA_IM_LINUX__X86_64 # /usr/sap/hostctrl/exe/sapcontrol -nr 39 -
function GetProcessList

18.07.2011 13:13:34

GetProcessList

OK

name, description, dispstatus, textstatus, starttime, elapsedtime, pid

hdbdaemon, HDB Daemon, GREEN, Running, 2011 07 18 11:02:30, 2:11:04, 1598

hdbnameserver, HDB Nameserver, GREEN, Running, 2011 07 18 11:02:32, 2:11:02, 1627

hdbpreprocessor, HDB Preprocessor, GREEN, Running, 2011 07 18 11:02:39, 2:10:55, 1671

hdbindexserver, HDB Indexserver, GREEN, Running, 2011 07 18 11:02:42, 2:10:52, 1688

hdbstatisticsserver, HDB Statisticsserver, GREEN, Running, 2011 07 18 11:02:44, 2:10:50, 1696

wdflbmd0417:/mnt/HANA_DVD/DATA_UNITS/HANA_IM_LINUX__X86_64 #
```

2.4.3 Logging on to the SAP HANA System Using the SAP HANA Computing Studio

Prerequisites

- The installation has finished successfully.
- You have installed and started the SAP HANA studio on your local PC as described in the SAP HANA Database - Studio Installation and Update Guide.

Procedure

1. Open the "Administration Console perspective" .
2. Right-click on the "Navigator" view and select "Add System".
3. Specify the required parameters, such as host name, instance number, and SAP system ID (SAPSID).
4. Choose "Authentication by database user" and enter `SYSTEM` for "User Name" .

Result

You see your SAP HANA system in the "Navigator" view.

Related Topics

- Ensuring User Security

2.4.4 Ensuring User Security

After the installation has finished, the master password is assigned to all users that were created by the installer. Make sure that you replace the master password with passwords that comply with your security guidelines. For more information, see the SAP HANA Security Guide.

Related Topics

- Logging on to the SAP HANA System Using the SAP HANA Computing Studio
- Users Created During the Installation

2.4.5 Configuring the Software Update Manager for SAP HANA

In addition to the SUM default configuration described in SUM for SAP HANA Default Configuration, you have to provide the server certificate for the SAP HANA Update UI.

You have to do this for each SAP HANA studio installation where the SAP HANA Update UI will be used.

Proceed as follows:

1. Copy the server certificate `sumforhana.cer` from `/usr/sap/<SID>/SUM/config/sumforhana.cer` to the host where the SAP HANA studio is installed.
2. Run the following command from the directory where you have copied `sumforhana.cer`:

   ```
   keytool -importcert -keystore "<JRE_DIR>\lib\security\cacerts" -alias sumforhana_$<hostname>_$<SAPSID> -file sumforhana.cer
   ```

   Note:

   `<JRE_DIR>` is the path to the Java runtime used by the SAP HANA studio. To find this path, choose **Help > About SAP HANA Studio > Installation Details > Configuration** and check the value of the java.home property.

   If the SAP HANA studio is installed on a UNIX/LINUX system, use forward slashes / in the command above.

   You will be asked for the key store password. Note that this is different from the password for the server key store. The default password for the `cacerts` key store is `changeit`, but if it has been changed you have to find out what it is and provide it here.

3. Restart the SAP HANA studio.

If the default security configuration is not suitable for your organization, see the SAP HANA Automated Update Guide for detailed configuration information. For security considerations, see the SAP HANA Security Guide.

Example: Contents of the SUM config directory after the installation has finished

```
wdflbmd7674:/usr/sap/S51/SUM/config # ll
total 32
drwxr-xr-x 2 s51adm sapsys 4096 Sep 2 00:30
drwxr-xr-x 23 s51adm sapsys 4096 Sep 2 00:30 .
-r-------- 1 s51adm sapsys 33 Sep 2 00:30 catalina.properties
-rw-r--r-- 1 s51adm sapsys 1238 Sep 2 00:30 keystore.jks
-rw-r--r-- 1 s51adm sapsys 449 Sep 2 00:30 sumforhana.cer
-rw-r--r-- 1 root root 4111 Aug 18 19:21 tomcat-server.xml
```

Related Topics

- SUM for SAP HANA Default Configuration

2.4.6 Accessing the SAP HANA Studio p2 Repository

The Software Update Manager (SUM) for SAP HANA server also hosts the p2 update site for the SAP HANA studio.

1. Make sure that the SUM for SAP HANA server is up and running.
   If required, start the SUM for SAP HANA as described in the SAP HANA Automated Update Guide.
2. Access the SAP HANA Studio p2 update site using the following URL:
   `https://<hostname>:8443/studio_repository`

Related Topics

- Configuring the Software Update Manager for SAP HANA

2.4.7 Enabling Automatic Start of the SAP HANA Database

By default the SAP HANA database is configured that it is not started automatically when the SAP HANA host is rebooted.

If required, you can change this configuration by modifying the profile of the SAP HANA database as follows:

1. Log on to the SAP HANA host as a user with `root` authorizations.
2. Change to the system profile directory `/usr/sap/<SAPSID>/SYS/profile`.
3. Edit the `<SAPSID>_HDB<Instance_No>_<host_name>` profile.
4. Change the parameter setting Autostart = 0 to Autostart = 1 .
5. Save the `<SAPSID>_HDB<Instance_No>_<host_name>` profile.

The SAP HANA database is started automatically when the SAP HANA host is rebooted.

2.4.8 Applying Updates and Support Packages

Prerequisite:

You have configured the SUM for SAP HANA as described in Configuring the Software Update Manager for SAP HANA

Procedure:

Use the **Lifecycle Management** perspective in the SAP HANA studio to update your system. For more information, see the SAP HANA Automated Update Guide.

2.4.9 Monitoring the SAP HANA System Landscape

Install and configure the required monitoring tools:

- SAP HANA studio for monitoring the SAP HANA database - see SAP HANA Database Administration Guide
- SAP NetWeaver monitoring tools (for example, SMD Agent)
- Monitoring tools of other SAP HANA components (for example SAP BusinessObjects monitoring tools)

Note:
For more information, see SAP HANA Technical Operations Manual, section *Monitoring the SAP HANA System Lanscape*.

Installing Trigger-Based Replication

For information about SAP HANA installation and upgrade for the trigger-based replication, see the SAP HANA Installation Guide - Trigger-Based Replication.

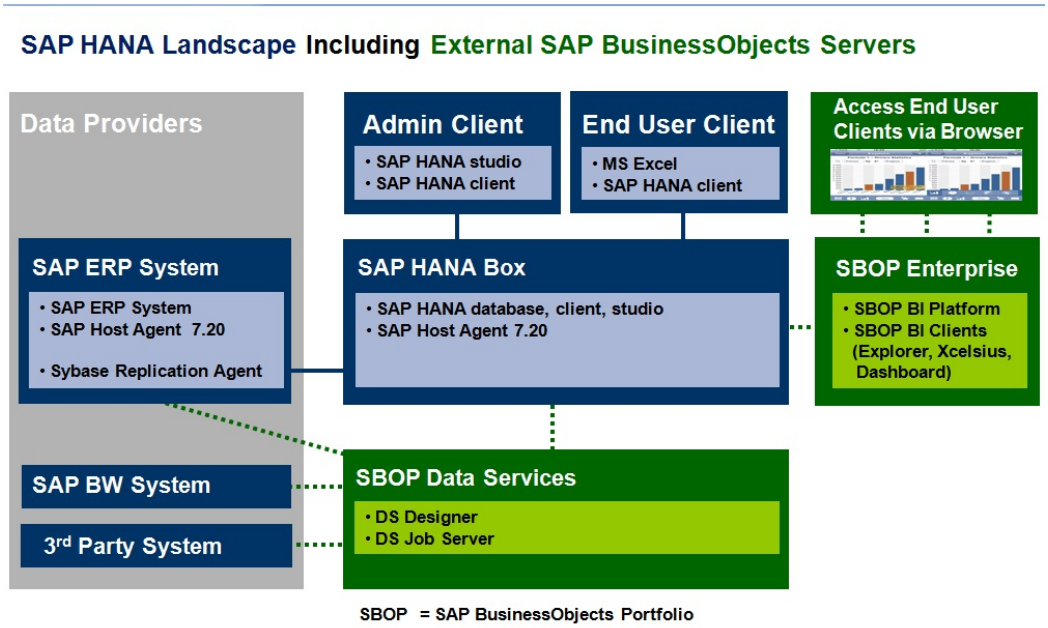
Note:
For trigger-based replication, no additional components will be installed on the SAP HANA system.

Installing ETL-Based Replication

In the log-based replication scenario, the ERP system is the data provider for SAP HANA, and this data can be analyzed by means of MS EXCEL as end user client on top.

In addition to these SAP HANA components, the customer can add existing SAP BusinessObjects products to the SAP HANA landscape. The information below provides a list of the available documentation to integrate SAP BusinessObjects Data Services to your SAP HANA landscape.

In addition to these SAP HANA components, the customer can add existing SAP BusinessObjects products to the SAP HANA landscape to use SAP BusinessObjects end user clients like SAP BusinessObjects Explorer or SAP BusinessObjects Xcelsius on top to analyze the data.



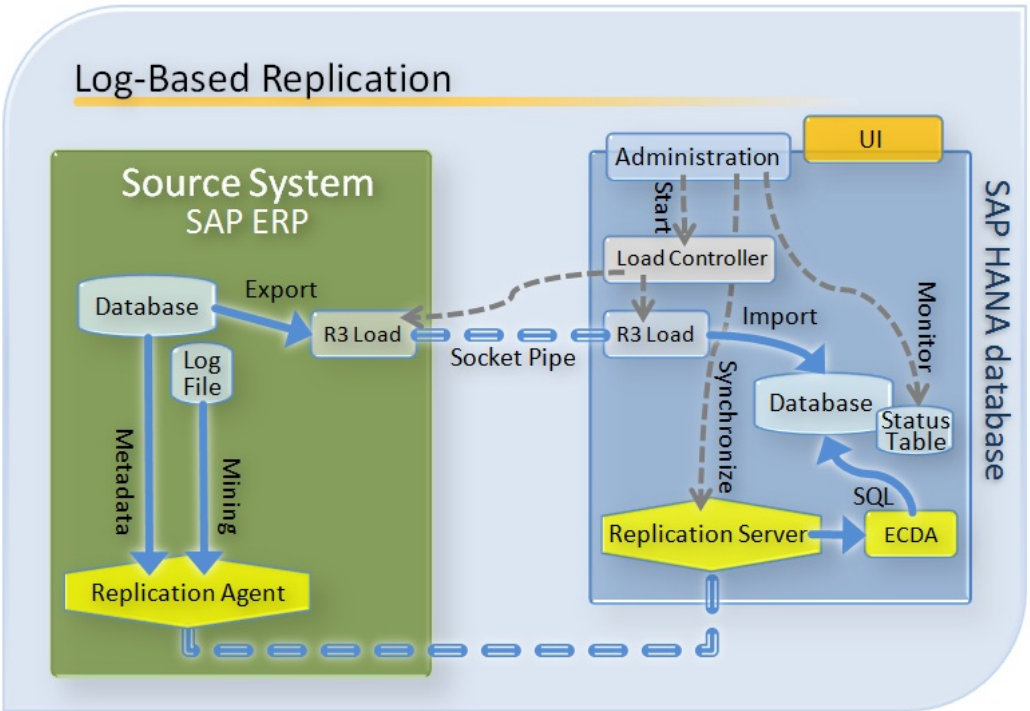
If you are not using BusinessObjects Enterprise with SAP BusinessObjects Data Services, you need information platform services installed together with SAP BusinessObjects Data Services. You can find the necessary installation and upgrade information in the following guides:

- Information Platform Services Installation Guide for UNIX
- Information Platform Services Installation Guide for Windows
- Data Services Installation Guide for UNIX
- Data Services Installation Guide for Windows
- Data Services Upgrade Guide

Log-Based Replication

5.1 Introduction to Log-Based Replication

The figure below shows how the Sybase Replication Server components and the SAP HANA Load Controller enable continuous data replication from the ERP system that is the data provider for SAP HANA. The role of the SAP HANA Load Controller in connection with the Modeler is also shown:



The SAP HANA Load Controller coordinates SAP HANA data replication as follows:

- The Modeler starts the SAP HANA Load Controller.
- The Load Controller starts the initial load of the SAP ERP data (source system) to the SAP HANA database on the SAP HANA system (target system). This is done using the R3load component on the SAP ERP system (source system) by exporting the data from the source system and importing the data to the SAP HANA database on the SAP HANA system (target system).
- In parallel, the Sybase Replication Agent on the SAP ERP system is started and performs log mining on the ERP source database. It relays all relevant information to the Replication Server on the SAP HANA system.

- As the main component, the Sybase Replication Server coordinates both the Sybase Replication Agent and the ECDA component.
- The Sybase Enterprise Connect Data Access (ECDA) connects to SAP HANA as the target database using an ODBC driver and mirrors the changes from the source database of the ERP system that are relayed through the Sybase Replication Server.
- After the initial load has been executed, and the changes in the source database during the initial load have been successfully replicated, the Sybase Replication Server and the related components perform the ongoing continuous data replication from the SAP ERP system to the SAP HANA box.

5.2 Installing Log-Based Replication

5.2.1 Updating the SAP Host Agent on Source System

The SAP HANA unified installer installs the required version of the SAP Host Agent on the SAP HANA box.

On the source system (ERP system), the SAP Host Agent is already installed, and an update might be necessary. Verify that the SAP Host Agent version on the source system (ERP system) is 7.20. If the version is not 7.20, follow the steps in the following SAP Note to upgrade the SAP Host Agent on the source system (ERP system): Installing and Upgrade the SAP Host Agent.

Troubleshooting

- Check the SAP Host Agent log file on the source system. In some cases, the process appears to start, but the log shows errors indicating that the agent cannot start. In this case, re-install the SAP Host Agent.
- Check the network configuration of SLES 11 SP1 as documented in SAP Note 1310037 (search for 127.0.0.2).
- If the source system is AIX, follow SAP Note SAP Note 1140980 (configure pam.d).
- If the error is "invalid credentials", check the user password and that the user is not locked in the source system.
- For more information, see How to use the SAP Host Agent.

5.2.2 Installing Sybase Components

Components

The Sybase Replication software includes three main processes:

1. Sybase Replication Agent (rep agent)

   Component does the log mining on the source database and relays all relevant information to the Replication Server

2. Sybase 'Enterprise Connect Data Access' (ECDA)

   Component that connects to the target database (SAP HANA database) via ODBC

3. Sybase Replication Server (rep server)

   Main component that accepts data from the Replication Agent distributes and applies this data to the target database using ECDA/ODBC for connectivity

Important Links

- Sybase Replication Server Reference Manual
- Introduction to Sybase Replication Command Language
- Replication Server Commands
- Sybase Replication Agent Reference Manual
- Replication Agent Command Reference

5.2.2.1 Installation of the Sybase Replication Server and ECDA

This task details the steps required to install and configure the Sybase Replication Server and Enterprise Connect Data Access (ECDA).

Installation files

The installation file for the replication components for the SAP HANA system is supplied in a single TAR image. The TAR image contains the Replication Server and ECDA images that are already preconfigured for SAP HANA usage. Apart from unpacking the tar image, only a few manual steps are required for installation.

Important: Do not deviate from the default values for Replication Server/Agent names. This could break the setup scripts.

Use the most current SYBASE software version (`drop<number>`) from SAP Service Marketplace.

There is one TAR image that accompanies this package: – `hana_drop<number>_rsdc_linux.tgz` (Note: Pre-GA version would include drop<number> in the tar filename). This package is for the SAP HANA system.

Installation and configuration sequence

Installation and configuration consists of three distinct stages

1. Decompressing and un-tarring the TAR image

2. Providing configuration settings unique to the host environment
3. Running an installation script to apply the configuration options to the servers

Installation prerequisites

- The TAR images should be installed at the following location `/usr/sap/sybase`

  Either create a directory under `/usr/sap/sybase` or a soft link to `/usr/sap/sybase`

  Ensure that sufficient space (100+GB) is available for `/usr/sap/sybase`
- The TAR image `hana_drop<number>_rsdc_linux.tgz` must be installed on the SAP HANA system.

  This image contains the pre-configured installations for Replication Server (RS) and Enterprise Connect Data Access (ECDA).
- The user installing images must have write permission to `/usr/sap/sybase`
- Prior to installing the TAR images for Sybase Replication for SAP HANA, SAP HANA database and SAP HANA studio should be installed.
- Install target replicate database (RDB).

  In the case of SAP HANA, the target database is SAP HANA database.
- Install SAP HANA studio on your Windows machine.

  Ensure that SAP HANA studio is able to connect to SAP HANA database replicate database.

Installation of TAR images

On the SAP HANA system (where SAP HANA database runs) perform the following:

1. `% cd /usr/sap/sybase`
2. `% tar xvfz hana_drop<number>_rsdc_linux.tgz`

   Note:
   Some operating systems require the compressed file to be uncompressed separately – the tar command may not perform this operation automatically. Use GNU unzip or a similar utility.
3. `% chown -R <sid>adm:sapsys /usr/sap/sybase/*`

   Note:
   For the Sybase Replication Server, SAP recommends using the same `<sid>adm` user, as used for SAP HANA database.

5.2.2.2 Installation of the Sybase Replication Agent

This task describes the installation and configuration of the Sybase Replication Agent that exists and executes ***on the SAP/ERP system***.

Installation files

The installation of the Replication Agent is delivered in a single TAR image. The Replication Agent is preconfigured for SAP HANA usage. Apart from unpacking the tar image, only a few manual steps are required for installation.

Important: Do not deviate from the default values for Replication Server/Agent names. This might break the setup scripts.

Use the most current SYBASE software version (drop<number>) from SAP Service Marketplace; for details see Software download.

There is one TAR image that accompanies this package: - `[hana_drop<number>_rax_<platform>.tgz` (Note: Pre-GA version would include `drop<number>` in the tar filename)

The `<platform>` represents the operating system the Replication Agent supports. This is meant for running on the ERP database system.

Installation and configuration sequence

Installation and configuration consists of three distinct stages

1. Decompressing and un-tarring the TAR image
2. Providing configuration settings unique to the host environment
3. Running an installation script to apply the configuration options to the servers

Installation prerequisites

- The TAR images should be installed at the following location `/usr/sap/sybase`

  Either create a directory under `/usr/sap/sybase` or a soft link to `/usr/sap/sybase`

  Ensure that sufficient space (5+GB) is available for `/usr/sap/sybase`
- The TAR image `hana_drop<number>_rax_<platform>.tar` is platform specific, and should be installed on the machine where SAP ERP database runs.

  This image contains the pre-configured installation for Replication Agent
- The user installing images must have write permission to `/usr/sap/sybase`
- If using SAP HANA, the installed source primary database (PDB), is DB2 UDB.
- Successful installation of the Replication Server on the SAP HANA system (Installation of the Sybase Replication Server and ECDA, Manually Configuring the Sybase Replication Server and ECDA).

Installation of TAR images

On the machine where SAP ERP database runs, perform the following:

1. `% cd /usr/sap/sybase`
2. `% tar xvfz hana_drop<number>_rax_<platform>`

Note:
Some operating systems require the compressed file to be uncompressed separately – the tar command may not perform this operation automatically. Use GNU unzip or a similar utility.

3. `% chown -R <sid>adm:sapsys /usr/sap/sybase/*`

Note:
For the Sybase Replication Agent, SAP recommends using the same `<sid>adm` user as used for the ERP source system.

5.2.2.3 Default Names and Login Information

Default Server/Service names and Port numbers used in TAR images

Component	Default Server Name	Default Service Name	Default Port	Comments
Replication Server	HANARS1	N/A	2121	
Replication Server Embedded RSSD	HA-NARS1_ERSSD	N/A	2122	Internally set to RS port + 1
ECDA	HANADC1	HANADC2SVC	2131	
RepAgent for DB2	HANARAU1	N/A	2141	
RepAgent DB2 Embedded RASD			2142	Internally set to RAU port + 1

Default Login Information Used in TAR Images

Component	Default User	Default Password	Comment
Replication Server	sa	Null	% isql --Usa --P --SHANARS1
Replication Server Embedded RSSD	HANARS1_RSSD_prim	HANARS1_RSSD_prim_ps	%isql --U<username> -P<password> -Sservername
ECDA	system (SAP HANA database default user)	manager (SAP HANA database default user password)	%isql --Usystem --Pmanager --SHANADC2SVC
RepAgent	sa	Null	%isql --Usa -P

5.2.3 Deploying the SAP HANA Load Controller and Related Components

Prerequisites

- The SAP HANA system (target system) and its components have to meet the requirements (see Hardware and Software Requirements).
- You have installed the Sybase Replication Server, Sybase ECDA and Sybase Replication Agent.
- You have downloaded the SAP HANA Load Controller from SAP Service Marketplace (see Software Download).
- The SAP ERP system (source system) has to meet the following requirements:
  - `R3load` : 700 Patch 134 or above, 701 Patch 37 or above, 720 Patch 65 or above
  - `R3ldctl` : 700 Patch 1 or above, 701 Patch 1 or above, 720 Patch 2 or above
  - SAP Host Agent Patch 46 or above
- Check the following SAP Notes:
  - 1571759 How to install new Load Controller package
  - 1575419 SAP HANA: Secure DB connect and password store

Components

To enable the SAP HANA Load Controller, you have to deploy and partially configure the following components:

- Deploy the following files on the SAP ERP source system/data provider:

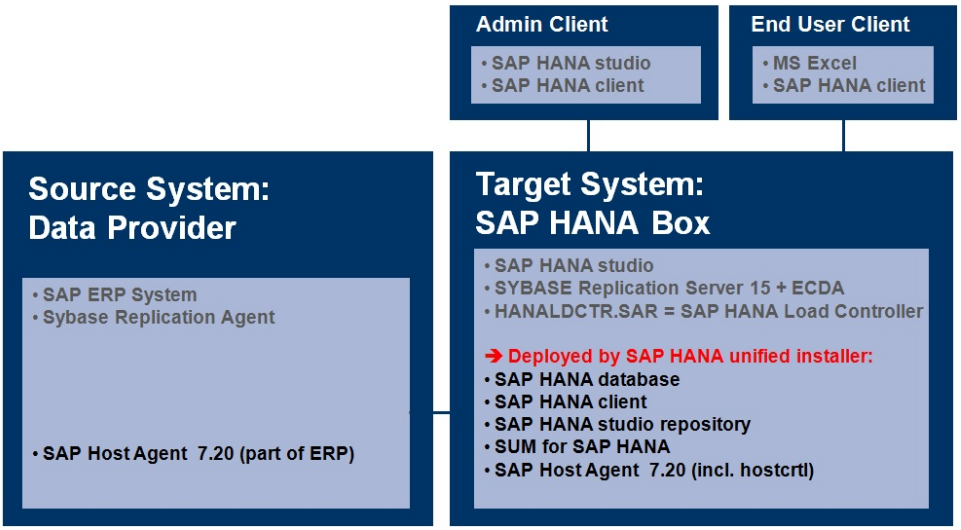
  SAP Host Agent 7.20 (including the file hostctrl). For more information, see Updating the SAP Host Agent on Source System.

A SAP Host Agent is normally part of an SAP ERP system and does not need to be installed.

- Deploy or install the following files or components on the SAP HANA system as target system:
  - `HANALDCTR.SAR` contains the SAP HANA Load Controller itself
  - SAP Host Agent 7.20 (incl. the file hostctrl)

    Note that you only need the file, since SAP HANA is running on the operating system SUSE Linux Enterprise Server (SLES) 11 SP1. For more information, see Hardware and Software Requirements .

Components needed for SAP HANA Load Controller



Extract the SAR archive files to obtain the following contents:

- `HANALDCTR.SAR` (=SAP HANA Load Controller), creates the following folders: `bin, config, exe, export, import, log, READ.me, sql, wrk`
- Patches for R3load and R3ldctl are available on SAP Service Marketplace (see Software Download).

5.2.3.1 On the SAP HANA System (Target System)

Deploy the HANALDCTR.SAR file with the SAP HANA Load Controller

1. Log in as the `<sid>adm` user; `<sid>` is the instance name of the SAP HANA database system (3 letters)
2. `cd /usr/sap/<sid>`
3. `mkdir HANA`
4. `mkdir HANA/LoadControl`
5. `cd HANA/LoadControl`

6. `SAPCAR -xvf HANALDCTR.SAR` (creates the following folders: `bin, config, exe, export, import, log, READ.me, sql, wrk`)

Install SAP Host Agent 7.20 (including the file hostctrl)

For more information, see Updating the SAP Host Agent on Source System. Note that you only need the SAPHOSTAGENT_linuxx86_64.SAR file, since SAP HANA is running on the operating system SUSE Linux Enterprise Server (SLES) 11 SP1. See Hardware and Software Requirements.

5.2.3.2 On the SAP ERP System (Source System)

Prepare the file system

1. Log in as the `<sid>adm` user; `<sid>` is the instance name of the ERP system (3 letters)
2. `cd /usr/sap/<sid>`
3. `mkdir HANA`
4. `mkdir HANA/export`
5. `mkdir HANA/export/DATA`
6. `mkdir HANA/export/wrk`
7. `mkdir HANA/export/DATA/ALL`

   Mount this directory on the target system as `<initload>/export/DATA/ALL`

Deploy the patches for R3load and R3ldctl

```
cp <PATH>/R3load<dbms_type> /sapmnt/<SID>/exe
```

5.3 Configuring Log-Based Replication

5.3.1 Configuring Sybase Components

5.3.1.1 Manually Configuring the Sybase Replication Server and ECDA

Startup and Connectivity establishment

This section deals with basic post-installation activities including starting various replication components and testing basic connectivity to individual components.

SAP HANA system

On the SAP HANA system (where SAP HANA database runs) perform the following as `<sid>adm`:

1. Source /usr/sap/sybase/SYBASE.sh:

   ```
   % . /usr/sap/sybase/SYBASE.sh
   ```

2. Go to the installation directory:

   ```
   % cd $SYBASE/postinstall/scripts
   ```

3. Make sure you are using the UTF-8 locale; otherwise errors might occur when trying to run the Replication Server:

   ```
   export LANG=en_US.UTF-8
   ```

4. Enter the important configuration details in postinstallcfg.res file. The following parameters need to be changed: RSHOST, NEWDBHOST, NEWDBNAME, NEWDBINST, NEWDBUSER, RAHOST

   Note:
   This is a critical step. Attempting to skip it or not performing the step in its entirety would cost more time later on.

   RSHOST – The machine name of the SAP HANA system where this Replication Server product is installed. This value can be the IP address of the machine, or the logical host name.

   NEWDBHOST – The machine name of the SAP HANA system where SAP HANA database is installed (should be the same as RSHOST)

   NEWDBNAME – The name of the SAP HANA database instance.

   NEWDBINST – The instance number for the SAP HANA database instance

   RAHOST – The machine name where the SAP/ERP system runs and the Replication Agent will be installed. This value can be the IP address of the machine, or the logical host name.

5. Run the configuration script:

   ```
   % . postinstallcfg.sh
   ```

   When prompted, enter the requested passwords.

   For "Enter SAP HANA database admin users password", enter the SAP HANA database SYSTEM user password.

   For a new installation, press 'Enter' for the RSSD admin user password (the default password is blank, it can be changed after the installation).

   For an upgrade, enter the correct password, if the 'sa' password was changed in the previous version.

   This script will perform will perform a number of tasks, including the following:

- Modify the Sybase interface file entries which identify TCP/IP host and post entries
- Modify the ECDA configuration file entries for connectivity to SAP HANA database via ODBC
- Boot ECDA
- Boot Replication Server
- Establish a test connection to Replication Server, and ECDA

6. The script reports output to `system.out` as it processes, and a number of errors might be reported. Note that these errors occur as expected - the script attempts to stop any prior processes and if the processes are not running (as expected on first install) an error from the shut down request may be reported.
7. If the install failes, the following message will be in the postinstall log, at the end of processing:

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Postinstall failed.
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

5.3.1.2 Manually Configuring the Sybase Replication Agent

Startup and Connectivity Establishment

This section deals with basic post installation activities including starting various replication components and testing basic connectivity to individual components.

SAP ERP Database System

After installing the tar image of the Replication Agent binary on the ERP database system, perform the following post-install activity. On the machine where SAP ERP database runs, perform the following as user `<sid>adm` of the source system:

1. Add aliases to the SYBASE.sh:

```
export LANG=C
alias hanars1='isql -Usa -P -SHANARS1 -c -Jutf8'
alias hanarau1='isql -Usa -P -SHANARAU1 -c -Jutf8'
```

2. Source /usr/sap/sybase/SYBASE.sh:

```
% . /usr/sap/sybase/SYBASE.sh
```

3. Go to the postinstall directory:

```
% cd $SYBASE/postinstall
```

4. Prepare your DB2 system for replication by setting up a DB2 as primary data source:

Note:
In a customer installation scenario, the DB2 steps outlined below can be performed by the DB2 DBAs well in advance of the actual SAP HANA installation. This can save time during the SAP HANA installation activity.

A. Creating a DB2 User for Replication Agent

The Replication Agent will use this user to communicate with DB2. The user needs to have the privileges of the DBADM group in order to set “DATA CAPTURE CHANGES” attribute on tables to be replicated.

a. Create user repagent at the operating system level (Note: Do NOT use upper case username, DB2 login will fail).
b. Log in as DB2 administrator user, e.g. for system D3D as user DB2D3D.
c. Start DB2 command prompt:

```
lsi155:db2d3d 5> db2
```

d. Create dbadm privileges to your new DB2 user, repagent => grant dbadm on database to repagent.
e. Enable archive log writing (it should already be enabled on a productive system)

```
connect

UPDATE DATABASE CONFIGURATION using LOGARCHMETH1 LOGRETAIN
```

f. You might have to restart the database for this setting to take effect:

```
stop force

start
```

g. You might also need to perform a backup before you can connect to the database again

```
backup db d3d
```

h. If you are in a test system and don't really need the backup, you can back up to {`/dev/null` } to speed up the process (depending on the database size, this can run for a while)

```
backup db d3d to /dev/null
```

i. You can monitor the progress of your backup in another DB2 session with the `LIST UTILITIES -SHOW DETAIL` command.

B. Determining the port number of the DB2 instance

a. The port number is dependent on your SAP system name and can be found in `/etc/services` , e.g. to determine the port of your DB2 database for SAP instance D3D:

```
db2d3d@lsi155:~> grep sapdb2 /etc/services sapdb2D3D 5912/tcp # SAP DB2
Communication Port
```

5. Edit `/usr/sap/sybase/postinstall/HANAUDBSourceEnv.txt` . Important parameters to change are:

udb_instance_home	The home directory for DB2
pds_host_name	The machine name where the SAP/ERP system runs and the Replication Agent is being installed. This value can be the IP address of the machine, or logical host name.
pds_port_number	The client port number for DB2, as determined under B. Determining the port number of the DB2 instance above.
pds_username	The DB2 user created under A. Creating a DB2 user for Replication Agent (see above). The user name from the example is repagent. Normally it is not the ERP database user name.
pdb_archive_path	The path to the UDB archive log files. Archive files will be read from this directory path and no other. Set pdb_archive_path to point to the location specified by either LOGARCHMETH1 or LOGARCHMETH2.
hana_host_name	The machine name of the SAP HANA system where the Sybase Replication Server and SAP HANA database are installed. This value can be the IP address of the machine, or logical host name.

This is an important step. Make sure that the information you provide in the configuration file is correct. Time spent in ensuring that the information provided here is correct will save a significant amount of time by preventing setup and configuration issues.

6. Run `/usr/sap/sybase/postinstall/hana_udb_validate_env.sh` . This step will validate basic settings and file access permissions to prevent avoidable errors. Only proceed to the next step if this script returns a successful validation.
7. Run `/usr/sap/sybase/postinstall/hana_udb_repagent_setup.sh` . You will be prompted to enter the password for the 'repagent' user. Press `<return>` to accept the default ‘null’ password. This script will perform various tasks, including the following:
   - Start the Replication Agent.
   - Configure the Replication Agent with host and port information for connecting to the SAP/ERP/DB2 system as well as the Replication Server on the SAP HANA box
   - Test connectivity to the SAP/ERP/DB2 system and to the Replication Server on the SAP HANA box
   - Initialize the Replication Agent to read the DB2 transaction log
   - Set the Replication Agent into “replicating” state.
8. At the end of processing, the `hana_udb_repagent_setup.sh` script will report wether or not the installation was successful. In case of failure, the script can be re-run once the problem has been corrected.

5.3.1.3 Initial Test of Replication

If you want to perform a manual test of the replication before continuing with the SAP HANA Load Controller setup you can perform the following steps:

1. Create a demo table in both the source and target systems: `Create Table Test(i int)` . We will use this table to test replication
2. Mark the table for replication. The table's owner in the target system is explicitly set to system

   ```
   pdb_setreptable Test, system.test,

   mark

   go
   ```

3. Start replication

   ```
   resume

   go
   ```

4. Insert a value into your test table in the source database and check whether it is replicated to the target database
5. Verify that the content is replicated into your target database. This might take a minute
6. Stop replication for your test table

   ```
   pdb_setreptable Test, disable

   go

   pdb_setreptable Test, unmark

   go
   ```

5.3.2 Manually Configuring the SAP HANA Load Controller on the SAP HANA System

5.3.2.1 Configure the Secure Connections for the Source System and the SAP HANA Database

1. Set the password for the connection to the SAP Host Agent using the following program: `/usr/sap/<sid>/HANA/LoadControl/exe/LdCtlHAStarter` . Use the following command on the source system to provide the `<sid>adm` password to the Load Controller:

   ```
   <LoadControllerDir>/exe/LdCtlHAStarter -loadControllerDir <LoadCon
   trollerDir> -updatePassword <password of sidadm-user>
   ```

2. Set the secure database connection using the hdbuserstore tool. The connection to the database on the SAP HANA system uses the user key "HANAREP". Provide the password of the database user to the SAP HANA Load Controller using the following command:

   ```
   /usr/sap/hdbclient/hdbuserstore SET HANAREP <newdbhost>:3<instance number>15 <SAP HANA user> <Password>
   ```

5.3.2.2 Configure the Configuration File reploaд.ini for the SAP HANA Load Controller

1. Navigate to `/usr/sap/<sid>/HANA/LoadControl/config/reploaд.ini`
2. Change the existing INI file `reploaд.ini.new` to `reploaд.ini` by configuring the following settings and parameters (Note that all pararepload.ini meters listed here need to be maintained. For examples of settings, see the end of the list):

portno:	Port number for R3load socket communication. Make sure that this port number is not being used by other components in the source system or target system. If you are configuring multiple data transfer channels, each SAP Load Controller needs a separate port number.
exportDir:	Location of the export directory in the source system . Default: /usr/sap/<sourceSID>/HANA/export .
newDBInstanceNO:	Instance number of the target system (SAP HANA instance).
newDBpasswd:	SAP HANA password. The default value is "manager"
dbs_hdb_port:	Do not change
export dbs_hdb_port:	Do not change
schemamane:	Schema name in SAP HANA database (default is SYSTEM)
#source system	
sourceSID:	SAPSYSTEMNAME (SID) of the target system
sourceHost:	Server name of an application server of the ABAP source system where R3load is running and you have installed the SAP Host Agent configuration files.
upper_source_dbms_type:	dbms_type of the source system (in uppercase). For example: DB6

osuser:	OS user <sidadm> of the source system.
ospasswd:	Password of the OS user <sidadm> of the source
SourceDBUser:	Database user or schema of the source system.
migrationkey:	Migration key for R3load. To obtain the migration key, contact SAP Support.
SYBASE:	Location of Sybase installation
export SYBASE	Do not change
# SYBASE_OCS (location of OCS libraries)	
SYBASE_OCS:	Location of Sybase OCS libraries
export SYBASE_OCS:	Do not change
# SYBASE_REP (location of Replication Server)	
SYBASE_REP:	Location of Sybase Replication Server Software
export SYBASE_REP:	Do not change
repScriptPath:	Do not change
#isql (isql binary to use)	
isql:	Location and name of the Sybase program isql (<Path>/isql)
# Replication Agent and Replication Server names (entries in interfaces file)	
prs01:	Name of Sybase Replication Server
rax01:	Name of Sybase Replication Agent
# Scripts use default ID 'sa' and passwords below	
rs_pwd:	
ra_pwd:	
# set primary (ERP) connection name attributes (DS.DB)	
pds01:	Sybase connection name of primary data server
pdb01:	Sybase connection name of primary database

# set replicate (SAP HANA) connection name attributes (DS.DB)	
rds01:	Sybase connection name of data server on SAP HANA
rdb01:	Sybase connection name of database on SAP HANA

An example of the complete configuration of all settings and parameters in the configuration file reload.ini for the SAP HANA Load Controller:

```
# socket Portnumber
portno=5701

# Path to export Directory on Host of Sourcesystem
exportDir=/usr/sap/RSS/HANA/export
newDBInstanceNO=00
dbs_hdb_dbhost=xxnnnn.wdf.sap.corp
dbs_hdb_port=3${newDBInstanceNO}15
export dbs_hdb_port
dbs_hdb_userkey=HANAREP
export dbs_hdb_userkey

#<schemaname in newDB>
schemaname=SYSTEM
#source system
sourceSID=RSS
sourceHost=lu01161.wdf.sap.corp
upper_source_dbms_type=XYZ
# XYZ DB2
osuser=rssadm
ospasswd=schoko01
SourceDBUser=Sapsr3

#migrationkey=a
migrationkey=1G5fdEM50DqSq3egt6h]pGhK
SYBASE=/usr/sap/sybase
export SYBASE
# SYBASE_OCS (location of OCS libraries)
SYBASE_OCS=OCS-15_0
export SYBASE_OCS
# SYBASE_REP (location of Replication Server)
SYBASE_REP=REP-15_5
export SYBASE_REP
repScriptPath=/usr/sap/sybase/${SYBASE_REP}/scripts
#isql (isql binary to use)
isql=/usr/sap/sybase/${SYBASE_OCS}/bin/isql
# Replication Server name (entries in interfaces file)
prs01=HANARS1
# Scripts use default ID 'sa' and passwords below
rs_pwd=
ra_pwd=
if [ "${upper_source_dbms_type}" == "XYZ" ]; then
   # Replication Agent name for orcale (entries in interfaces file)
   rax01=HANARAO1
   # set primary (ERP) connection name attributes  (DS.DB)
   pds01=HANARAO1
   pdb01=HANARAO1
   # set replicate (NewDB) connection name attributes  (DS.DB)
   rdb01=XYZ2NEWDB
   rds01=HANADC1SVC
elif [ "${upper_source_dbms_type}" == "DB6" ]; then
   # Replication Agent name for DB6 (entries in interfaces file)
   rax01==HANARAU1
   # set primary (ERP) connection name attributes  (DS.DB)
   pds01=HANARAU1
   pdb01=HANARAU1
   # set replicate (NewDB) connection name attributes  (DS.DB)
   rdb01=UDB2NEWDB
   rds01=HANADC2SVC
else
   echo "ERROR: unknown dbms_type!"
   exit -40
```

```
fi
```

5.3.2.3 Verify the Successful Deployment and Configuration of the SAP HANA Load Controller

After configuring the SAP HANA Load Controller, test the connectivity to the source database, SAP HANA database, Sybase Replication Agent, and Sybase Replication Server.

1. Navigate to the folder `/usr/sap/<sid>/HANA/LoadControl/bin`
2. Execute the following command: `./LoadController.SH -testDBconnects` as OS user `<sid>adm`. This call creates a number of status tables in the SAP HANA system.
3. If this test call has been successfully executed, the following output appears:

```
check remote Shell Calls and exportDir
check saphost agent connection to source system and database
Connection to source system via saphostagent is possible.
Source Database is running.
check target database
Target Database is running.
Repagent and repserver are running.
```

5.3.2.4 Using the SAP HANA Load Controller

1. Navigate to the folder `/usr/sap/<sid>/HANA/LoadControl/exe`
2. Execute the command `./LoadController.SH`

```
Usage: LoadController.SH
-loadTablelist <tablename 1> <tablename 2> <tablename 3> ... <tablename n>
-loadTablelistWithoutReplication <tablename 1> <tablename 2> <tablename 3> ... <tablename n>
-onlyCreate <tablename 1> <tablename 2> <tablename 3> ... <tablename n>
-allDBobjectsCreate
-bruteForceLoad <tablename>
-testDBconnects
-getStatus
-h
-help
```

3. Execute the command `./LoadController.SH -allDBobjectsCreate`