



Installation Guide | PUBLIC

SAP HANA 2.0, express edition 2.0 SPS 07

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Getting Started with SAP HANA 2.0, express edition (Binary Installer Method)

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1 Getting Started with SAP HANA 2.0, express edition (Binary Installer Method)

The SAP HANA 2.0, express edition Binary Installer is for Linux machines running specific installations that need to meet storage and memory prerequisites. Choose this installation method if you want a custom setup.

Disclaimer

SAP HANA, express edition is officially supported on SLES. SAP Community members have been successful in running SAP HANA, express edition on other Linux operating systems that are not formally supported by SAP, such as Ubuntu, openSUSE and Fedora. SAP is not committing to resolving any issues that may arise from running SAP HANA, express edition on these platforms.

1.1 Machine Requirements

Check if your machine has the recommended software and hardware to install and run SAP HANA 2.0, express edition. The Server + Applications package requires more RAM than the server-only package.

Procedure

1. Ensure that your system meets the hardware requirements.

Check if your system has the required hardware to successfully install and run SAP HANA, express edition.

Hardware	Details
RAM	Server: 16 GB minimum (24 GB recommended) Server + Applications: 24 GB minimum (32 GB recommended) Note: If you're installing on a system with 16 GB of RAM, increase the amount of swap space to at least 32 GB.
HDD	120 GB HDD recommended
Cores	4 cores

2. Ensure that your system has:

- **Java Runtime Environment (JRE) 8 or Higher:** If you're planning to use the SAP HANA, express edition Download Manager for Windows or Linux, you need the 64-bit JRE. If you're planning to use the platform-independent Download Manager, you can use either the 32-bit or 64-bit versions. You can download the SAP JVM (64-bit) from <https://tools.hana.ondemand.com/#cloud>.
3. Ensure that your system meets the OS requirements. SAP strongly recommends you use "RHEL for SAP Solutions" or "SLES for SAP Applications" because of their features and extended support cycle.

i Note

S-users and P-users can access the latest Supported Operating Systems SAP Note at [2235581](https://support.sap.com/en/notes/2235581).

Supported Operating Systems for SAP HANA on Intel-Based Hardware Platforms

For running on Intel-based hardware platforms the following operating systems are supported:

- **Red Hat**
 - **RHEL 9 for SAP Solutions / RHEL 9 for SAP HANA**
 - 9.0

i Note

For RHEL 9, set SELinux mode to Disabled permanently. Run this command and then reboot the server.

```
# grubby --args="selinux=0" --update-kernel=ALL
```

- **RHEL 8 for SAP Solutions / RHEL 8 for SAP HANA**
 - 8.8
 - 8.6

i Note

For RHEL 8, set SELinux mode to Disabled permanently. Run this command and then reboot the server.

```
# sed -i 's/\(SELINUX=enforcing\|SELINUX=permissive\)/SELINUX=disabled/g' /etc/selinux/config
```

- **SUSE**
 - **SLES for SAP Applications 15 / SLES 15**
 - 15 SP5
 - 15 SP4

Supported Operating Systems for SAP HANA on IBM Power Servers

For running on IBM Power servers the following operating systems are supported:

- **Red Hat**
 - **RHEL 9 for SAP Solutions / RHEL 9 for SAP HANA**
 - 9.0
 - **RHEL 8 for SAP Solutions / RHEL 8 for SAP HANA**
 - 8.8

- 8.6
- **SUSE**
 - SLES for SAP Applications 15 / SLES 15
 - 15 SP5
 - 15 SP4

1.2 Register

Register your copy of SAP HANA, express edition to access the download manager.

Procedure

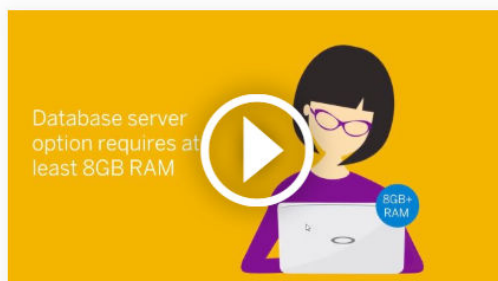
1. Complete the registration form.

Go to the Download SAP HANA, express edition registration page at <https://www.sap.com/cmp/td/sap-hana-express-edition.html>.

Click the **Register for your free version** button.

SAP HANA, express edition

Download SAP HANA, express edition



Install your free SAP HANA, express edition

- You will need a minimum of 8GB RAM for the database server only and 16GB for the database + XS Advanced applications*. If you do not have enough RAM in your local computer, you can quickly deploy SAP HANA, express edition in the cloud (see: <https://developers.sap.com/topics/sap-hana-express.html#deployment>).
- SAP HANA, express edition is available for free, for development and productive use, up to 32GB of RAM.
- SAP HANA combines an ACID-compliant, in-memory database with advanced analytics processing, such as geospatial, graph, document store and machine learning libraries.

* Learn more about how to check RAM on a Windows computer (see: <https://developers.sap.com/tutorials/hxe-ram-disk-ms.html>) or on a Mac computer (see: <https://developers.sap.com/tutorials/hxe-ram-disk-mac.html>).

[Register for your free version](#)

Read and accept the end user license agreement, and then click the **Submit** button.

Thank you for your interest in SAP



End user license agreement

☐ Please acknowledge that you have read and accept the [end user license agreement](#).

Submit

The registration form displays.

On the registration form, enter all required information and click the **Submit** button.

Thank you for your interest in SAP

One time registration for continuous access

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Documents & Reports

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Tell us about yourself

E-mail address *

First name *

Last name * ☐ ☐

Company *

Office location
United States

Phone
 +1 XXX-XXX-XXXX

Relationship to SAP *

Create password *

Confirm password *

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Would you like to subscribe to the Global SAP Developer Newsletter?
☐ Yes ☐ No

☐ I have read and understood the Terms and Conditions of [SAP.com](#)

SAP will use any of the data provided hereunder in accordance with the [Privacy Statement](#).

Submit

i Note

If you have an SAP login, click the Login icon at the top of the page to populate the registration form automatically.

You will receive an email indicating successful registration.

2. Choose a download manager.

Click the download manager that matches your system: **Linux DM** or **Windows DM**.

If you have a Mac, or another type of machine, click **Platform-independent DM** for a platform-independent download manager.



Welcome to SAP HANA, express edition

Get the Download Manager (DM) for SAP HANA 2.0, express edition below.

Note: A Java Runtime Environment (JRE) is required. Download it from: <https://tools.hana.ondemand.com/#cloud>

[Linux DM](#)

64-bit JRE required

[Windows DM](#)

64-bit JRE required

[Platform-independent DM](#)

32-bit or 64-bit JRE required

If you're looking for other installation alternatives, including cloud options, visit the SAP Developer Center below.

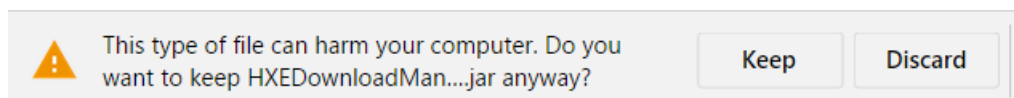
[Visit SAP Developer Center](#)

i Note

You must click the download manager links on the Registration Success page. If you attempt to copy a download manager URL to your browser, the download will fail with an error.

3. Save the download manager file.

Save the download manager file to your laptop and open it. If your system displays a security warning when you open the file, ignore the warning.



i Note

If you are inside a corporate firewall, you will be prompted for your proxy settings. Contact your IT administrator for your proxy host and proxy port information.

1.3 Download Using the Download Manager (GUI Mode)

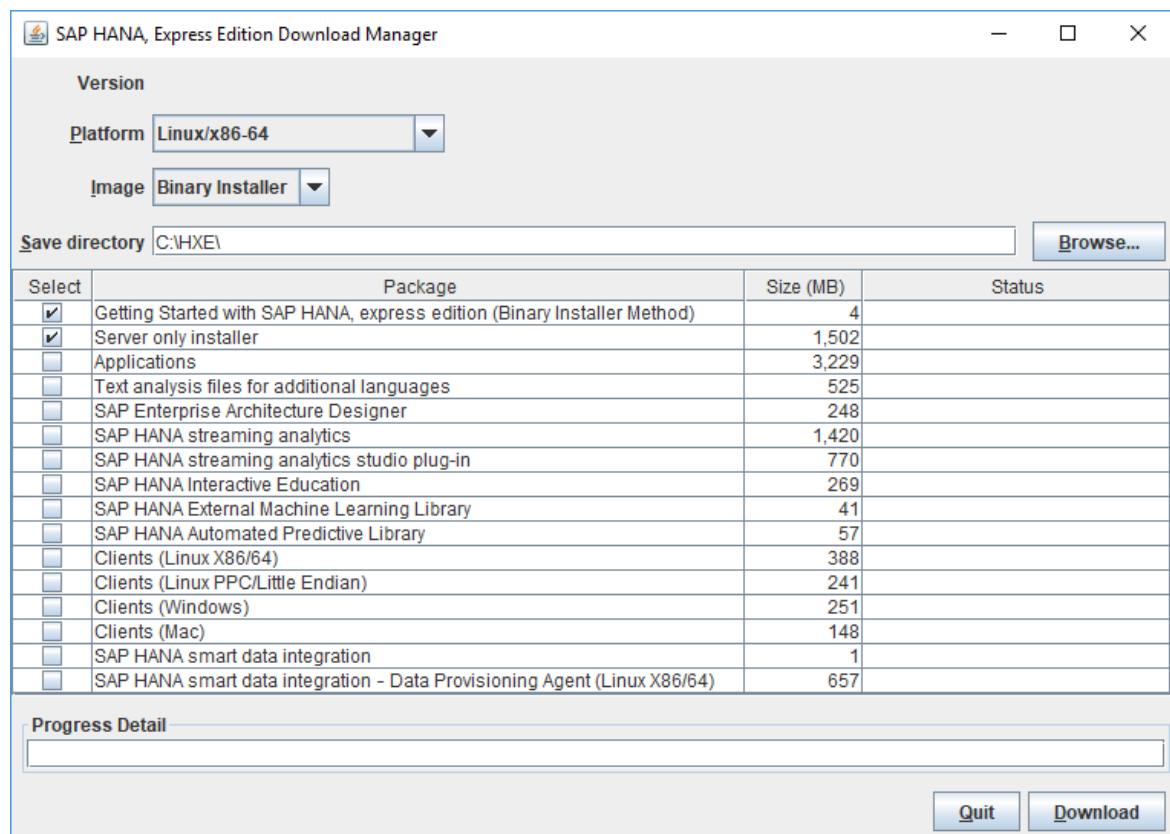
Use the Download Manager in GUI mode to download the SAP HANA 2.0, express edition server only installer, XSA applications installer, and additional installation packages.

Procedure

1. Select your platform and image.

In the Download Manager, in the **Platform** pull-down, select the platform you are installing on. In the **Image** pull-down, select Binary Installer.

Click **Browse** and select a directory for your downloaded files.



2. Select the core packages to download.

Select the **Server only installer** package and, if you want to install XSA, the **Applications** package.

- **Server only installer** downloads `hxe.tgz`, which contains the SAP HANA 2.0, express edition server with Application Function Library. This file is necessary for installing SAP HANA 2.0, express edition.
- **Applications** downloads `hxexsa.tgz`, which contains XS Advanced, Web IDE, and SAP HANA Cockpit.

i Note

SAP plans to remove SAP HANA extended application services, classic model (XSC) and the corresponding SAP HANA Repository with the next major product version of SAP HANA.

These components will be removed:

- SAP HANA extended application services, classic model
- SAP HANA Repository (XS classic)
- SAP HANA Studio (Development, Modeling, and Administration perspectives)
- SAP HANA Web-based Development Workbench (XS classic)

SAP strongly advises you to plan the transition of existing content and applications from XSC to SAP HANA extended application services, advanced model (XS Advanced).

3. Select additional packages.

Package	Details
Getting Started with SAP HANA, express edition (Binary Installer Method)	Downloads a PDF version of this documentation.
Text analysis files for additional languages	For languages other than English and German, these files are required for the HANA Text Analysis function. (The text analysis files for English and German are already included in the Server only and Applications packages.) For the text analysis files installation procedure, see the Install the Optional Text Analysis Files Package for SAP HANA, express edition [page 25] topic.
SAP HANA External Machine Learning Library	Downloads <code>eml.tgz</code> , which contains the SAP HANA External Machine Learning Library. The SAP HANA External Machine Learning Library is an application function library (AFL) supporting the integration of Google TensorFlow, as an external machine learning framework, with SAP HANA, express edition.
SAP HANA Automated Predictive Library	Downloads <code>ap1.tgz</code> , which contains the SAP HANA Automated Predictive Library. The SAP HANA Automated Predictive Library is an application function library which exposes the data mining capabilities of the Automated Analytics engine in SAP HANA through a set of functions.
Clients (Linux X86/64)	<p>Downloads <code>clients_linux_x86_64.tgz</code>. Each clients package downloads an archive containing client-tools bundles for the listed platform. Use the client packages to access developed SAP HANA 2.0, express edition applications from a client PC. The client machine does not require a SAP HANA installation to install and run the clients. See Install the Optional Clients Package for SAP HANA, express edition [page 27].</p> <p>Tip: After you develop an application using SAP HANA 2.0, express edition, install Download Manager to a client machine and download the Clients package to that client machine. You can then use the clients to connect to -- and test -- your HANA applications, emulating a customer.</p>

Package	Details
Clients (Linux PPC/Little Endian)	<p>Downloads <code>clients_linux_ppc64le.tgz</code>. Each clients package downloads an archive containing client-tools bundles for the listed platform. Use the client packages to access developed SAP HANA 2.0, express edition applications from a client machine. The client machine does not require a SAP HANA installation to install and run the clients. See Install the Optional Clients Package for SAP HANA, express edition [page 27].</p> <p>Tip: After you develop an application using SAP HANA 2.0, express edition, install Download Manager to a client machine and download the Clients package to that client machine. You can then use the clients to connect to -- and test -- your HANA applications, emulating a customer.</p>
Clients (Windows)	<p>Downloads <code>clients_windows.zip</code>. Each clients package downloads an archive containing client-tools bundles for the listed platform. Use the client packages to access developed SAP HANA 2.0, express edition applications from a client machine. The client machine does not require a SAP HANA installation to install and run the clients. See Install the Optional Clients Package for SAP HANA, express edition [page 27].</p> <p>Tip: After you develop an application using SAP HANA 2.0, express edition, install Download Manager to a client machine and download the Clients package to that client machine. You can then use the clients to connect to -- and test -- your HANA applications, emulating a customer.</p>
Clients (Mac)	<p>Downloads <code>clients_mac.tgz</code>. Each clients package downloads an archive containing client-tools bundles for the listed platform. Use the client packages to access developed SAP HANA 2.0, express edition applications from a client machine. The client machine does not require a SAP HANA installation to install and run the clients. See Install the Optional Clients Package for SAP HANA, express edition [page 27].</p> <p>Tip: After you develop an application using SAP HANA 2.0, express edition, install Download Manager to a client machine and download the Clients package to that client machine. You can then use the clients to connect to -- and test -- your HANA applications, emulating a customer.</p>
SAP HANA smart data integration	<p>Downloads <code>sdi.tgz</code>. SAP HANA smart data integration provides functionality to access source data, and to provision, replicate, and transform that data in SAP HANA on premise, or in the cloud. See Install the Optional SAP HANA Smart Data Integration Package for SAP HANA, express edition [page 38].</p>
SAP HANA smart data integration - Data Provisioning Agent (Linux X86/64)	<p>Downloads <code>dpagent_linux_x86_64.tgz</code>. The Data Provisioning Agent provides secure connectivity between the SAP HANA database and your adapter-based sources. See Install the Optional SAP HANA Smart Data Integration Package for SAP HANA, express edition [page 38].</p>

4. Download the files.

Click the **Download** button.

Your download is complete when a pop-up message appears confirming successful download. Make sure you wait for this message before accessing the downloaded files.

1.4 Download the Installer Files

Use the Download Manager in console mode to download the SAP HANA 2.0, express edition server only installer, XSA applications installer, and additional installation packages.

Prerequisites

Close the Download Manager if it is running in GUI mode.

Context

i Note

The Download Manager for Windows (`HXEDownloadManager_win.exe`) runs in asynchronous mode, and console mode is not available. If you are a Windows user, download the platform-independent Download Manager (`HXEDownloadManager.jar`) to use console mode.

Procedure

1. Open a command prompt.

Open a command prompt at the location where you saved the Download Manager file (`HXEDownloadManager.jar` or `HXEDownloadManager_linux.bin`).

i Note

If you've already installed SAP HANA express edition, you can run the built-in download manager from any directory as the `<sid>adm` user.

2. Display the command help using the `-h` argument.

Linux `x86_64` Download Manager example:

```
HXEDownloadManager_linux.bin -h
```

Platform-independent Download Manager example:

```
java -jar HXEDownloadManager.jar -h
```

i Note

You must include an argument with each command. If you call the Download Manager without an argument, it opens in GUI mode.

3. Familiarize yourself with the command syntax, and the command arguments.

Command syntax is:

```
HXEDownloadManager [( [-h|-X] | [-d <save_directory>] [--ph <proxy_host>] [--pp <proxy_port>] <platform> <image> <file>... )]
```

Command arguments are:

Argument	Description
-h	Print this help
-x	Print extended help
-d <save_directory>	Directory where to save the download file. Default is %USERPROFILE%\Downloads on Windows; and ~/Downloads on Linux.
--ph <proxy_host>	Proxy host name or IP address.
--pp <proxy_port>	Proxy port.
<platform>	HANA platform. Valid values are linuxx86_64 , linuxppc64le .
<image>	Type of image to download. Valid values for linuxx86_64 platform are: vm , installer . Valid values for linuxppc64le platform are: installer .
<file>	File(s) to download.

Valid <file> values:

Package	Description
Getting_Started_Binary_Installer.pdf	User manual in PDF format: <i>Getting Started with SAP HANA, express edition (Binary Installer Method)</i> .
hxe.tgz	Downloads hxe .tgz, which contains the SAP HANA 2.0, express edition server with Application Function Library. This file is necessary for installing SAP HANA 2.0, express edition.
hxexsa.tgz	Downloads hxexsa .tgz, which contains XS Advanced, Web IDE, and SAP HANA Cockpit. Valid only when downloaded with hxe .tgz.

Package	Description
<code>additional_lang.tgz</code>	Downloads <code>additional_lang.tgz</code> . For languages other than English and German, this package is required for the HANA Text Analysis function. (The text analysis files for English and German are already included in the <code>hxe.tgz</code> and <code>hxexsa.tgz</code> packages.) For installation steps, see Install the Optional Text Analysis Files Package for SAP HANA, express edition [page 25] .
<code>eml.tgz</code>	Downloads HANA Extended Machine Learning AFL.
<code>apl.tgz</code>	Downloads SAP HANA Automated Predictive Library.
<code>clients_linux_x86_64.tgz</code>	Client download package for Linux machines (x86/64 architectures). Use the client packages to access developed SAP HANA, express edition applications from a client PC. For installation steps, see Install the Optional Clients Package for SAP HANA, express edition [page 27] .
<code>clients_linux_ppc64le.tgz</code>	Client download package for Linux machines (little endian on Power architectures). Use the client packages to access developed SAP HANA, express edition applications from a client PC. For installation steps, see Install the Optional Clients Package for SAP HANA, express edition [page 27] .
<code>clients_windows.zip</code>	Client download package for Windows machines. Use the client packages to access developed SAP HANA, express edition applications from a client PC. For installation steps, see Install the Optional Clients Package for SAP HANA, express edition [page 27] .
<code>clients_mac.tgz</code>	Client download package for Mac. Use the client packages to access developed SAP HANA, express edition applications from a client PC. For installation steps, see Install the Optional Clients Package for SAP HANA, express edition [page 27] .
<code>sdi.tgz</code>	SAP HANA smart data integration download package. SAP HANA smart data integration provides functionality to access source data, and to provision, replicate, and transform that data in SAP HANA on premise, or in the cloud. For installation instructions, see Install the Optional SAP HANA Smart Data Integration Package for SAP HANA, express edition [page 38] .

Package	Description
<code>dpagent_linux_x86_64.tgz</code>	SAP HANA smart data integration - Data Provisioning Agent (Linux X86/64) download package. The Data Provisioning Agent provides secure connectivity between the SAP HANA database and your adapter-based sources. For installation instructions, see Install the Optional SAP HANA Smart Data Integration Package for SAP HANA, express edition [page 38].

- Download one or more files.

If you want applications like XS Advanced, Web IDE, and SAP HANA Cockpit, download both `hxe.tgz` and `hxexsa.tgz`. If you want optional packages, download them now as well.

This example uses the platform-independent Download Manager `HXEDownloadManager.jar`.

It downloads *Getting Started with SAP HANA, express edition (Binary Installer Method)* and `hxexsa.tgz`.

```
java -jar HXEDownloadManager.jar linuxx86_64 installer
Getting_Started_Binary_Installer.pdf hxexsa.tgz
```

1.5 Install SAP HANA 2.0, express edition

Extract the installation files and set up your SAP HANA 2.0, express edition installation – with XS Advanced, Web IDE, and SAP HANA Cockpit.

Procedure

- Extract the installation files.

Navigate to the directory where you wish to extract the installation files.

Extract the contents of the following files:

- `hxe.tgz`
- `hxexsa.tgz` (if you are installing the Applications package)
- `eml.tgz` (if you are installing the External Machine Learning Library)
- `sdi.tgz` (if you are installing smart data integration)
- `apl.tgz` (if you are installing the Automated Predictive Library)

```
tar -xvzf <download_path>/hxe.tgz
```

```
tar -xvzf <download_path>/hxexsa.tgz
```

```
tar -xvzf <download_path>/eml.tgz
```

```
tar -xvzf <download_path>/hsa.tgz
```

```
tar -xvzf <download_path>/sdi.tgz
```

```
tar -xvzf <download_path>/apl.tgz
```

→ Tip

Run the `tar` command from the command shell as shown, rather than using a GUI-based extraction tool.

i Note

You may have to give these files run permissions. Example:

```
chmod 444 <download_path>/hxe.tgz
```

2. Start the installation.

Navigate to the directory where you extracted the files and run `./setup_hxe.sh` as the root user:

```
cd <extracted_path>  
sudo ./setup_hxe.sh
```

Follow the prompts to configure your installation.

i Note

The master password you specify during installation is used for the `<sid>adm` and `sapadm` OS users, the telemetry technical user, and the SYSTEM user. The password is also used for the following users in additional components:

- XSA_ADMIN and XSA_DEV (Applications package)

SAP HANA, express edition requires a *very strong password* that complies with these rules:

- At least 8 characters
- At least 1 uppercase letter
- At least 1 lowercase letter
- At least 1 number
- Can contain special characters, but not ``` (backtick), `$` (dollar sign), `\` (backslash), `'` (single quote), or `"` (double quotes)
- Cannot contain simplistic or systematic values, like strings in ascending or descending numerical or alphabetical order

1.6 Test SAP HANA, express edition

Test your SAP HANA, express edition installation. Test your XSC, XSA, SAP Web IDE, and Cockpit installations.

Procedure

1. Test your server installation.

In a terminal, log in as the `<sid>adm` user.

Enter `HDB info`. The following services must be running:

- `hdbnameserver`
- `hdbcompileserver`
- `hdbwebdispatcher`
- `hdbdiserver` (if XSA is installed)

If any services are not running, enter `HDB start`. When the prompt returns, the system is started.

Check that the XSEngine is running. Open a browser and enter:

```
http://<hostname>:80<instance-number>
```

A success page displays:



2. Test XSA. (Applications Package Only)

As the `<sid>adm` user, log in to XSA services:

```
xs-admin-login
```

At the prompt for the `XSA_ADMIN` password, enter the master password you specified during installation.

View the list of XSA applications:

```
xs apps
```

i Note

When you run the `xs apps` command for the first time, it may take 1-2 minutes for the system to return the list of XSA applications.

Check that the application `cockpit-admin-web-app` shows **STARTED** with 1/1 instances in the list of XSA applications.

i Note

Normally it only takes a few minutes for XSA services to start. However, depending on your machine, it can take over 30 minutes for XSA services to begin. If the service doesn't show **STARTED** and doesn't show 1/1 instances, keep waiting until the service is enabled.

Make a note of the URL for `cockpit-admin-web-app`.

```
cockpit-admin-web-app    STARTED    1/1    128 MB    <unlimited>    https://my.hostname:51043
```

Enter the URL for `cockpit-admin-web-app` in a browser. The address is the one that displays in your `xs apps` command output.

Example: `https://my.hostname:51043`

Log in using the **XSA_ADMIN** user.

If your site uses a proxy for connecting to HTTP and HTTPS servers, select ► **Cockpit Settings** ► **Proxy** ►, then enable **Http(s) Proxy** and set the host, port, and non-proxy hosts.

→ Tip

To find your proxy server information, in a terminal, enter `env | grep PROXY`.

i Note

If you are using HANA Cockpit to register a resource, both HANA Cockpit and the SAP HANA, express edition server must be from the same release. SAP does not recommend using a newer HANA Cockpit to register an older version of SAP HANA, express edition.

3. (Optional) Turn on XSA messaging. (Applications Package Only)

If you want the XSA messaging service, issue these commands to start the messaging service applications:

```
xs start messaging-service-hub
xs start messaging-service-node
xs start messaging-service-broker
```

4. Test Web IDE. (Applications Package Only)

As the `<sid>adm` user, log in to XSA services:

```
xs-admin-login
```

At the prompt for the **XSA_ADMIN** password, enter the master password you specified during installation.

View the status of the `webide` application. Enter:

```
xs apps | grep webide
```

Check that the application `webide` shows **STARTED** with 1/1 instances in the list of XSA applications.

i Note

Normally it only takes a few minutes for XSA services to start. However, depending on your machine, it can take over 30 minutes for XSA services to begin. If the service doesn't show **STARTED** and doesn't show **1/1** instances, keep waiting until the service is enabled.


Make a note of the URL for `webide`.

Test your Web IDE connection. Enter the URL for `webide` in a browser. The address is the one that displays in your `xs apps` command output.

Example: `https://my.hostname:53075`

Log on to Web IDE using the **XSA_DEV** user.

5. (Optional) Test Your Installation Using the HANA Eclipse Plugin.

Download *Eclipse IDE for Java EE Developers* from <http://www.eclipse.org/neon/>  to your local file system.

Follow the Eclipse installer prompts.

Launch when prompted, or go to the Eclipse folder (example: `C:\Users\<path>\eclipse\jee-neon`) and run the `eclipse` executable file.

Follow the tutorial [How to download and install the HANA Eclipse plugin](#)  to connect to your SAP HANA, express edition client machine.

2 Configuring Data Collection

Enable or disable telemetry data collection, and delete collected data.

When you install SAP HANA 2.0, express edition, data collection is enabled by default. You can disable data collection after installing SAP HANA, express edition. Data collection sends anonymous performance statistics and usage statistics to SAP, so that SAP can focus development efforts on areas most vital to the SAP HANA, express edition customer base.

i Note

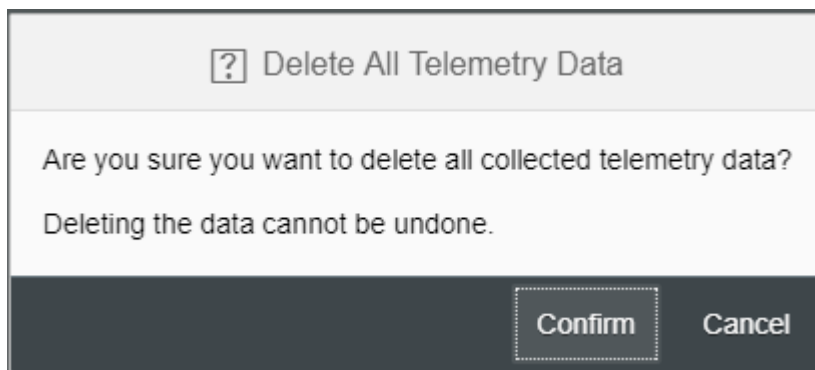
Your privacy is important to SAP. Telemetry collects anonymous usage information while ensuring complete privacy. No identifying information or private information is collected, and you can opt out of telemetry at any time.

To disable data collection, log on to your Cockpit and go to the **Notifications and Feedback** section. Click on **Configure telemetry data collection**. Uncheck the **Enable Telemetry Data Collection** box and click **Save**.

Telemetry Properties

Enable Telemetry Data Collection: ☒

You can also delete data that has been collected by clicking the **Delete Collected Data** button and selecting **Confirm**.



If you are inside a corporate firewall and use a proxy for connecting to HTTP and HTTPS servers, you need to identify your proxy settings, log in to Cockpit, and update the **Cockpit Settings > Proxy** page.

i Note

If you modify the proxy settings through Cockpit, you must manually restart the Cockpit services for the changes to apply.

```
xs restart cockpit-hdb-svc
xs restart cockpit-xsa-svc
```

```
xs restart cockpit-telemetry-svc
```

2.1 Disable and Enable Data Collection via Command Line

Disable data collection through the command line if you wish to stop sending anonymous data to SAP and do not have access to Cockpit.

Procedure

1. Start SAP HANA 2.0, express edition and log in as the `<sid>adm` user.
2. To disable data collection, run:

```
/usr/sap/<sid>/home/bin/hxe_telemetry.sh -i <instance-number> -u SYSTEM -p  
"<password>" -d SystemDB --disable
```

3. To re-enable data collection, run:

```
/usr/sap/<sid>/home/bin/hxe_telemetry.sh -i <instance-number> -u SYSTEM -p  
"<password>" -d SystemDB --enable
```

To learn more about the `hxe_telemetry.sh` script, type `./hxe_telemetry.sh --help`.

2.2 Check your Proxy Settings

If you are inside a corporate firewall and use a proxy for connecting to <http> and <https> servers, check your proxy settings using SAP HANA Cockpit.

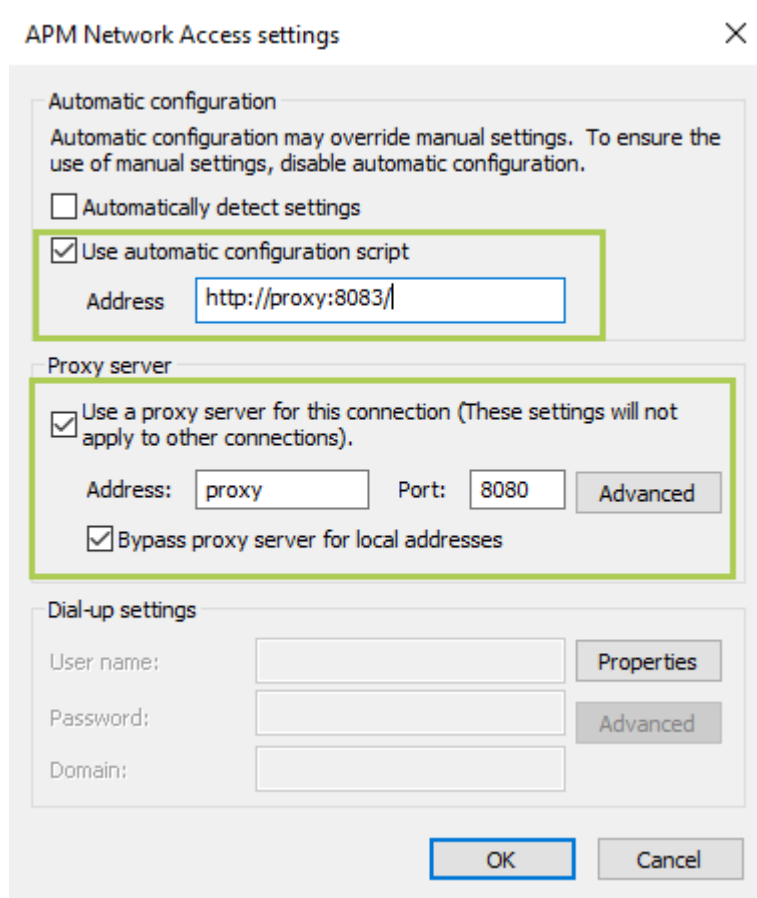
Procedure

1. Obtain your proxy settings from your system administrator. You set your proxy settings earlier in this tutorial.

i Note

If you are not inside a firewall, you can ignore this step and skip to the next topic.

- In this example using Internet Explorer on Windows 10, notice how connections use a proxy server on port 8080.



2. In the Cockpit Manager of the SAP HANA Cockpit, select ► **Cockpit Settings** ► **Proxy** ►.

Proxy

Network Proxy

Enable: ☐

*Host:

*Port:

Http(s) Proxy

Enable: ☒

*Host:

*Port:

Non Proxy Hosts:

Save

3. Under **Http(s) Proxy**, verify that **Enable** is checked.

i Note

Http(s) Proxy should be enabled, not the *Network Proxy*.

4. In *Host*, *Port*, and *Non Proxy Hosts*, verify the settings provided by your IT administrator.
 Make sure *Host* has a fully qualified domain name.
 Make sure the *Non Proxy Hosts* list includes *localhost*, *hxehost*, and *hxehost.localdomain*.
5. If you made any changes, click **Save**.

3 Installing Additional Components

When possible, download the additional components by running the download manager from within your SAP HANA, express edition installation using the `<sid>adm` user. The download manager can be found in the `~<sid>adm/bin` directory.

Run the following to download the additional components for Linux x86-64:

```
HXEDownloadManager_linux.bin linuxx86_64 installer <component_filename>
```

To download additional components for Linux PPC64LE, use the following:

```
java -jar HXEDownloadManager.jar linuxppc64le installer <component_filename>
```

To see the download manager help and options, run the download manager with the `-h` or `-x` option.

Here is a full list of the additional components:

- SAP Enterprise Architecture Designer - `eadesigner.tgz`
- SAP HANA Interactive Edition - `shine.tgz`
- SAP HANA streaming analytics - `hsa.tgz`
- SAP streaming analytics studio plug-in - `hsa_plugin.zip`
- HANA External Machine Learning AFL - `eml.tgz`
- Clients (Linux X86/64) - `clients_linux_x86_64.tgz`
- Clients (Linux PPC/Little Endian) - `clients_linux_ppc64le.tgz`
- Clients (Windows) - `clients_windows.zip`
- Clients (Mac) - `clients_mac.tgz`
- SAP HANA smart data integration - `sdi.tgz`
- SAP HANA smart data integration Data Provisioning Agent (Linux x86-64) - `dpagent_linux_x86_64.tgz`
- Text analysis files for additional languages - `additional_lang.tgz`

3.1 Install the Optional Text Analysis Files Package for SAP HANA, express edition

If you are using SAP HANA 2.0, express edition in a language other than English or German, you can download the [Text analysis files for additional languages](#) package in the Download Manager.

Context

The [Text analysis files for additional languages](#) package contains the text analysis files for the HANA Text Analysis feature (for languages other than English or German).

Procedure

1. Download additional_lang.tgz.

Download additional_lang.tgz using the built-in Download Manager. From directory /usr/sap/<SID>/home/bin enter:

```
HXEDownloadManager_linux.bin linuxx86_64 installer additional_lang.tgz
```

2. Update folder permissions.

Update the folder permissions on the lang folder.

Navigate to /hana/shared/<SID>/global/hdb/custom/config/lexicon/

Enter this command:

```
chmod 755 lang
```

3. Extract additional_lang.tgz.

This step extracts <download_path>/additional_lang.tgz to /hana/shared/<SID>/global/hdb/custom/config/lexicon. Enter this command:

```
tar -xvzf /usr/sap/<SID>/home/Downloads/additional_lang.tgz -C /hana/shared/<SID>/global/hdb/custom/config/lexicon
```

→ Tip

If your tables do not use a full text index, or if your tables use a full text index but contain very little data, you can save about 120 MB of memory if you turn off the standalone text analysis preprocessor, and activate the embedded text analysis preprocessor.

Stop the standalone preprocessor:

```
alter system alter configuration ('daemon.ini','SYSTEM') set ('preprocessor','instances') = '0' with reconfigure;
```

Start the embedded preprocessor:

```
alter system alter configuration ('preprocessor.ini','SYSTEM') set  
('general','embedded') = 'true' with reconfigure;
```

3.2 Install the Optional SAP HANA Automated Predictive Library Package for SAP HANA, express edition

SAP HANA Automated Predictive Library (APL) is an application function library which exposes the data mining capabilities of the Automated Analytics engine in SAP HANA, express edition through a set of functions.

Context

SAP HANA Automated Predictive Library is a separate download. Use the commands in this procedure to download the SAP HANA Automated Predictive Library package `apl.tgz` using the built-in Download Manager (console mode).

Procedure

1. Download `apl.tgz`.

Use the built-in Download Manager (console mode) to download the SAP HANA Automated Predictive Library package, `apl.tgz`.

Navigate to `/usr/sap/HXE/home/bin`:

```
cd /usr/sap/HXE/home/bin
```

If your installation is on [x86_64](#), enter the following command:

```
./HXEDownloadManager_linux.bin linuxx86_64 installer apl.tgz
```

If your installation is on [PowerPC](#), enter the following command:

```
java -jar HXEDownloadManager.jar linuxppc64le installer apl.tgz
```

2. Navigate to the download directory.

```
cd ~/Downloads
```

3. Extract `apl.tgz`.

```
tar -xvzf apl.tgz
```

4. Run the installation script.

As the `<sid>adm` user, run:

```
sudo <extracted_path>/HANA_EXPRESS_20/install_apl.sh
```

3.3 Install the Optional Clients Package for SAP HANA, express edition

Install the clients if you intend to develop XS applications on a machine that will not have a local SAP HANA 2.0, express edition installation.

The clients let you access SAP HANA 2.0, express edition from your client machine.

You can install the clients on the SAP HANA 2.0, express edition server during server installation, but this how-to assumes you are installing the clients on a different machine than the machine where SAP HANA 2.0, express edition is installed.

This how-to refers to the laptop with SAP HANA 2.0, express edition as the *server machine*, and your local machine as the *client machine*.

3.3.1 Installing SAP HANA HDB Client (Windows)

Install the client package if you intend to develop XS applications on a machine that won't have a local SAP HANA 2.0, express edition installation.

Prerequisites

- From this client machine, you registered for SAP HANA 2.0, express edition and gained access to the Download Manager. See [Register \[page 6\]](#).
- You downloaded the Download Manager to this client machine.

Context

The *server machine* in these instructions refers to the laptop on which SAP HANA 2.0, express edition is installed, while *client machine* refers to your local machine. You don't need to install the two on the same machine or VM.

The clients let you access SAP HANA 2.0, express edition, from your client machine. This is the Reduced SAP Client package.

The clients included with the SAP HANA HDB client software package are:

- JDBC
- ODBC
- SQLDBC
- ODBO/MDX
- Python (PyDBAPI)
- ADO.NET

To install the SAP HANA HDB client on a Windows machine, use either a graphical user interface or a command line.

Procedure

1. Download the client package using the Download Manager you downloaded in the Prerequisites.

1. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.
2. Click *Browse* and select a directory where your client package will be saved.
3. Select the *Clients (Windows)* package. Clear the Select boxes of all other packages.
4. Click *Download*. The file `clients_windows.zip` downloads to your save directory.
5. Use a compression utility to extract the compressed clients file.

This extracts the following files and their contents:

- `hana_ml<*version>.tar.gz`
- `hana.ml.r<*version>.tar.gz`
- `hdb_client_windows_x86_32.zip`
- `hdb_client_windows_x86_64.zip`
- `xs.onpremise.runtime.client_ntamd64.zip`

2. Install the SAP HANA HDB client.

SAP HANA HDB client installation supports both GUI and console methods.

1. Use a compression utility to extract the downloaded files `hdb_client_windows_x86_32.zip` or `hdb_client_windows_x86_64.zip` for 32-bit and 64-bit installations respectively.

The following file path is created:

```
hdb_client_windows/HDB_CLIENT_WINDOWS_X86_32
```

or

```
hdb_client_windows/HDB_CLIENT_WINDOWS_X86_64
```

2. Navigate to the `HDB_CLIENT_WINDOWS_86_32` or `HDB_CLIENT_WINDOWS_X86_64` folder.
3. In the file explorer, double-click:

- `hdbsetup.exe` - GUI installation
- `hdbinst.exe` - Command-line installation

Or from a command prompt:

Call the program `hdbsetup` (GUI installation) or `hdbinst` (command-line installation) by entering one of the following commands:

- GUI - `hdbsetup [-a client]`

- Command Line - `hdbinst [-a client] [<option list>]`

Follow the onscreen prompts displayed by the installation tool.

4. Add the installation path to the PATH environment variable. For information on setting environments variables, see the documentation for your operating system.



3. Log the installation.

The system automatically logs the SAP HANA HDB client installation. The log files are stored at `%TEMP%\hdb_client_<time_stamp>`.

4. Connect to SAP HANA, express edition.

Connect to an SAP HANA 2.0, express edition system using either JDBC or Python.

See these [Tutorials](#):

- [Connect to SAP HANA, express edition using JDBC](#) 
- [Connect to SAP HANA, express edition using Python](#) 

5. Uninstall the SAP HANA HDB client.

Each installation has its own uninstallation tool. Use the `hdbuninst` command to uninstall the client software from your command prompt.

```
sudo <unzipped_filepath>/HDB_CLIENT_<version>/hdbuninst
```

Follow the instructions on the screen to uninstall the SAP HANA HDB client.

3.3.2 Installing SAP HANA HDB Client (Mac)

Install the client package if you intend to develop XS applications on a machine that will not have a local SAP HANA 2.0, express edition installation.

Prerequisites

- From this client machine, you registered for SAP HANA 2.0, express edition and gained access to the Download Manager. See [Register \[page 6\]](#).
- You downloaded the Download Manager to this client machine. See .

Context

The [server machine](#) in these instructions refers to the laptop on which SAP HANA 2.0, express edition is installed, while [client machine](#) refers to your local machine. You do not need to install the two on the same machine or VM.

The clients let you access SAP HANA 2.0, express edition, from your client machine. This is the Reduced SAP Client package.

The clients included with the SAP HANA HDB client software package are:

- JDBC
- ODBC
- SQLDBC
- ODBO/MDX
- Python (PyDBAPI)
- ADO.NET

Procedure

1. Download the client package using the Download Manager you downloaded in the Prerequisites..

1. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.
2. Click *Browse* and select a directory where your client package will be saved.
3. Select the *Clients (Mac)* package. Clear the Select boxes of all other packages.
4. Click *Download*. The `clients_mac.tgz` file downloads to your save directory.
5. Use a compression utility to extract the compressed clients file.

This extracts the following files and their contents:

- `hdb_client_mac.tgz`
- `xs.onpremise.runtime.client_darwinintel64.zip`

2. Install the SAP HANA HDB client.

To install the SAP HANA client on a Mac machine, do the following:

1. Go to the directory where you wish to unpack the `hdb_client_mac.tgz` files:

```
cd <your_destination>
```

2. Unpack the file:

```
sudo tar -xvzf <unzipped_filepath>/hdb_client_mac.tgz
```

The directory `HDB_CLIENT_MACOS` is created.

3. Navigate to the `HDB_CLIENT_MACOS` directory. Start the installation by either:

- Double-clicking `client-ccl-dmg-x.xx.xx-darwinintel64.dmg`
- Executing this command in the command line:

```
./client-ccl-dmg-x.xx.xx-darwinintel64.dmg
```

Follow the instructions on the screen to install the SAP HANA HDB client.

3. Log the installation.

The system automatically logs the SAP HANA HDB client installation. The log files are stored at `%TEMP%\hdb_client_<time_stamp>` for Windows and `/var/temp/hdb_client_<time_stamp>` for Linux.

4. Connect to SAP HANA, express edition.

Connect to a SAP HANA 2.0, express edition system using either JDBC or Python.

See these *Tutorials*:

- [Connect to SAP HANA, express edition using JDBC](#) 

- [Connect to SAP HANA, express edition using Python](#) 🐍
5. Uninstall the SAP HANA HDB client.

Each installation has its own uninstallation tool. Use the `hdbuninst` command to uninstall the client software from your command prompt.

```
sudo <unzipped_filepath>/HDB_CLIENT_<version>/hdbuninst
```

Follow the instructions on the screen to uninstall the SAP HANA HDB client.

3.3.3 Installing SAP HANA HDB Client (Linux)

Install the client package if you intend to develop XS applications on a machine that will not have a local SAP HANA 2.0, express edition installation.

Prerequisites

- From this client machine, you registered for SAP HANA 2.0, express edition and gained access to the Download Manager. See [Register \[page 6\]](#).
- You downloaded the Download Manager to this client machine. See .

Context

The *server machine* in these instructions refers to the laptop on which SAP HANA 2.0, express edition is installed, while *client machine* refers to your local machine. You do not need to install the two on the same machine or VM.

The clients let you access SAP HANA 2.0, express edition, from your client machine. This is the Reduced SAP Client package.

The clients included with the SAP HANA HDB client software package are:

- JDBC
- ODBC
- SQLDBC
- ODBO/MDX
- Python (PyDBAPI)
- ADO.NET

Procedure

1. Download the client package using the Download Manager you downloaded in the Prerequisites..
 1. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.
 2. Click *Browse* and select a directory where your client package will be saved.
 3. Select the *Clients (Linux X86/64)* package. Clear the Select boxes of all other packages.
 4. Click *Download*. The `clients_linux_x86_64.tgz` file downloads to your save directory.
 5. Extract the compressed clients file:
Navigate to the directory in which you wish to extract the client files and use the `tar` command:

```
cd <preferred_filepath>
sudo tar <download_filepath>/clients_linux_x86_64.tgz
```

This extracts the following files and their contents:

- `hana_ml<*version>.tar.gz`
- `hana.ml.r<*version>.tar.gz`
- `hdb_client_linux_x86_64.tgz`
- `xs.onpremise.runtime.client_linuxx86_64.zip`

2. Install the SAP HANA HDB client.

To install the SAP HANA client on a Linux machine, do the following:

1. Go to the directory where you wish to unpack the `hdb_client_linux_x86_64.tgz` files:

```
cd <your_destination>
```

2. Unpack the file:

```
sudo tar -xvzf <unzipped_filepath>/hdb_client_linux_x84_64.tgz
```

The directory `HDB_CLIENT_LINUX_X86_64` is created.

3. Navigate to the `HDB_CLIENT_LINUX_X86_64` directory and run `hdbinst` to start the installer:

```
cd HDB_CLIENT_LINUX_X86_64
sudo ./hdbinst
```

Follow the instructions on the screen to install the SAP HANA client.

3. Log the installation.

The system automatically logs the SAP HANA HDB client installation. The log files are stored at `/var / temp/hdb_client_<time_stamp>` for Linux.

4. Connect to SAP HANA, express edition.

Connect to a SAP HANA 2.0, express edition system using either JDBC or Python.

See these *Tutorials*:

- [Connect to SAP HANA, express edition using JDBC](#) 📖
- [Connect to SAP HANA, express edition using Python](#) 📖

5. Uninstall the SAP HANA HDB client.

Each installation has its own uninstallation tool. Use the `hdbuninst` command to uninstall the client software from your command prompt.

```
sudo <unzipped_filepath>/HDB_CLIENT_<version>/hdbuninst
```

Follow the instructions on the screen to uninstall the SAP HANA HDB client.

3.3.4 Installing SAP HANA HDB Client (PowerPC)

Install the client package if you intend to develop XS applications on a machine that will not have a local SAP HANA 2.0, express edition installation.

Prerequisites

- From this client machine, you registered for SAP HANA 2.0, express edition and gained access to the Download Manager. See [Register \[page 6\]](#).
- You downloaded the Download Manager to this client machine. See .

Context

The *server machine* in these instructions refers to the laptop on which SAP HANA 2.0, express edition is installed, while *client machine* refers to your local machine. You do not need to install the two on the same machine or VM.

The clients let you access SAP HANA 2.0, express edition, from your client machine. This is the Reduced SAP Client package.

The clients included with the SAP HANA HDB client software package are:

- JDBC
- ODBC
- SQLDBC
- ODBO/MDX
- Python (PyDBAPI)
- ADO.NET

Procedure

1. Download the client package using the Download Manager you downloaded in the Prerequisites..
 1. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.

2. Click [Browse](#) and select a directory where your client package will be saved.
3. Select the [Clients \(Linux PPC/Little Endian\)](#) package. Clear the Select boxes of all other packages.
4. Click [Download](#). The `clients_linux_ppc64le.tgz` file downloads to your save directory.
5. Extract the compressed clients file.

Navigate to the directory in which you wish to extract the client files and use the `tar` command:

```
cd <preferred_filepath>
sudo tar <download_filepath>/clients_linux_ppc64le.tgz
```

This extracts the following files and their contents:

- `hdb_client_linux_ppc64le.tgz`
- `xs.onpremise.runtime.client_linuxppc64le-1.0.85.zip`

2. Install the SAP HANA HDB client.

To install the SAP HANA client on a Linux PowerPC machine, do the following:

1. Go to the directory where you wish to unpack the `hdb_client_linux_ppc64le.tgz` files:

```
cd <your_destination>
```

2. Unpack the file:

```
sudo tar -xvzf <unzipped_filepath>/hdb_client_linux_ppc64le.tgz
```

The directory `HDB_CLIENT_LINUX_X86_64` is created.

3. Navigate to the `HDB_CLIENT_LINUX_X86_64` directory and run `hdbinst` to start the installer:

```
cd HDB_CLIENT_LINUX_PPC64LE
sudo ./hdbinst
```

Follow the instructions on the screen to install the SAP HANA HDB client.



3. Log the installation.

The system automatically logs the SAP HANA HDB client installation. The log files are stored at `/var/temp/hdb_client_<time_stamp>`.

4. Connect to SAP HANA, express edition.

Connect to a SAP HANA 2.0, express edition system using either JDBC or Python.

See these [Tutorials](#):

- [Connect to SAP HANA, express edition using JDBC](#) 
- [Connect to SAP HANA, express edition using Python](#) 

5. Uninstall the SAP HANA HDB client.

Each installation has its own uninstallation tool. Use the `hdbuninst` command to uninstall the client software from your command prompt.

```
sudo <unzipped_filepath>/HDB_CLIENT_<version>/hdbuninst
```

Follow the instructions on the screen to uninstall the SAP HANA HDB client.

3.3.5 Installing XS CLI Client

Install the client package if you intend to develop XS applications on a machine that will not have a local SAP HANA 2.0, express edition installation. The clients let you access SAP HANA 2.0, express edition from your client machine.

Prerequisites

- From this client machine, you registered for SAP HANA 2.0, express edition and gained access to the Download Manager. See [Register \[page 6\]](#).
- You downloaded the Download Manager to this client machine. See .

Context

The *server machine* in these instructions refers to the machine on which SAP HANA 2.0, express edition is installed, while *client machine* refers to your local machine. You do not need to install the two on the same machine or VM.

The XS advanced client-tools bundle (`xs.onpremise.runtime.client_<platform>-<version>.zip`) also includes the Javascript bundle (`xs_javascript-1.3.0-bundle.tar.gz`), which includes a selection of mandatory `Node.js` packages developed by SAP for use with the `Node.js` applications running XS Advanced runtime.

You can use the XS command line client to perform a wide variety of developer- and administrator-related tasks. For example, in the role of a developer, you can use the XS CLI to connect to the XS Advanced runtime installed on the server machine, log on as a specific user, and deploy and manage your applications.

Procedure

1. Download the client package using the Download Manager you downloaded in the Prerequisites..
 1. In Download Manager, in the *Image* pull-down, select either *Virtual Machine* or *Binary Installer*.
 2. Click *Browse* and select a directory where your client package will be saved.
 3. Select the *Clients* package that matches the machine you will be installing the clients on. Clear the Select boxes of all other packages.
 4. Click *Download*. The `hdb_client_<OS>.tgz` file, or `clients_windows.zip` for Windows, downloads to your save directory.
 5. Extract the compressed clients file:
 - For Windows and Mac machines, use a compression utility.
 - For Linux, navigate to the directory in which you wish to extract the client files and use the tar command.

```
cd <preferred_filepath>
```

```
sudo tar -xzf<download_filepath>/clients_<OS>.tgz
```

These files are extracted:

clients_linux_x86_64.tgz

- hdb_client_linux_x86_64.tgz
- xs.onpremise.runtime.client_linuxx86_64.zip

clients_linux_ppc64.le.tgz

- hdb_client_linux_ppc64le.tgz
- xs.onpremise.runtime.client_linuxx86_64.zip

clients_windows.zip

- hdb_client_windows_x86_32.tgz
- hdb_client_windows_x86_64.tgz
- xs.onpremise.runtime.client_ntamd64.zip

clients_mac.tgz

- hdb_client_mac.tgz
- xs.onpremise.runtime.client_darwinintel64.zip

2. Install the XS CLI client.

Use a compression utility to extract the file you downloaded for your platform:

- (Windows) xs.onpremise.runtime.client_ntamd64.zip
- (Mac) xs.onpremise.runtime.client_darwinintel64.zip
- (Linux) xs.onpremise.runtime.client_linuxx86_64.zip
- (PowerPC) xs.onpremise.runtime.client_linuxppc64le.zip

The system creates this folder:

```
xs.onpremise.runtime.client_<version>
```

3. Add the bin folder to the PATH environment variable.

- (Windows) In the Environment Variables dialog:
 - Edit **System variables > Path**
 - Add <extracted_filepath>\bin
 - Restart your command line application for your new environment variable settings to take effect.
- (Mac) Run `export PATH=$PATH:/<extracted_filepath>/bin`
- (Linux) Run `export PATH=$PATH:/<extracted_filepath>/bin`
- (Power PC) Run `export PATH=$PATH:/<extracted_filepath>/bin`

4. Verify XS Advanced runtime is installed.

Enter the following URL into your Web browser:

```
https://<hana_hostname>:3<instance_number>30/v2/info
```

For example:

```
https://my.hana.server:39030/v2/info
```

The response displayed in the Web browser is a JSON string with details that indicate whether there was a successful connection to the XSA controller. The connection must exist before you can connect from within the API command.

5. Confirm XS Advanced is Available

On your client machine, open a command window and run the following.

```
xs help
xs -v
```

On Linux, run these as `<sid>adm`.

You see the *Client Version* in the output. If not, you cannot connect to XS Advanced runtime on SAP HANA to deploy your XS Advanced applications.

6. Connect to XS Advanced controller.

Specify the URL of the API end point on the SAP HANA server you want to connect to:

```
xs api https://<hostname>:3<instance_number>30
```

Note

If this step fails, it may be due to a missing SSL certificate. Continue on to the next step to add the SSL certificate, otherwise skip the next step.

7. Add SSL certificate to connect to the server.

Open a command session on the server machine or open a PuTTY session to the server machine. From the command prompt, log in as `sudo` and go to the certificate `default.root.crt.pem`, which is typically located here:

```
<installation_path>/<SID>/xs/controller_data/controller/ssl-pub/router
```

For example, where `<installation_path>` is `/hana/shared` and `<SID>` is `HXE` the certificate location would be:

```
/hana/shared/HXE/xs/controller_data/controller/ssl-pub/router/
default.root.crt.pem
```

Copy the certificate to a folder on the server where you can easily access it. Using an FTP client or the `scp` command, send a copy of the certificate from your server machine to a safe location on your client machine.

FTP:

```
/<path>/default.root.crt.pem
```

scp:

```
scp <server_machine_user>@<ip_address_server>:<file_destination>/
default.root.crt.pem
<client_machine_user>@<ip_address_client>:<your_desired_filepath>\
```

Exit your FTP and PuTTY sessions and return to your client machine. Try the previous command again, but use the `-cacert` option and specify the local certificate you just copied:

```
xs api https://<hostname>:3<instance_number>30 - cacert "<copied_filepath>/default.root.crt.pem"
```

Log on to the SAP HANA instance specified in the API end point that you set in a previous step. SAP HANA provides the default `XSA_ADMIN` user with administrator permissions. Although you can use this user ID to test the connection, you should create a new user with more limited permissions to use for developer tasks.

To log on, run the following:

```
xs login -u XSA_ADMIN -p "<password>"
```

Note

A password is assigned to the `XSA_ADMIN` user during SAP HANA 2.0, express edition installation.

8. Test the XS Advanced connection.

To test your connection to XS Advanced by running the following command on the SAP HANA 2.0, express edition server:

```
xs apps
```

3.4 Install the Optional SAP HANA Smart Data Integration Package for SAP HANA, express edition

Install SAP HANA smart data integration on an SAP HANA, express edition system.

Context

This installs the Data Provisioning Server on SAP HANA, express edition, and deploys the data provisioning delivery unit that enables monitoring and other capabilities.

Procedure

1. Download `sdi.tgz`.

Download [sdi.tgz](#) using the built-in Download Manager. Enter:

```
HXEDownloadManager_linux.bin linuxx86_64 installer sdi.tgz
```

2. Extract sdi.tgz.

Extract *sdi.tgz*:

```
tar -xvzf sdi.tgz
```

3. Run the installation script.

As the *<sid>*adm user, run:

```
HANA_EXPRESS_20/install_sdi.sh
```

4. Next steps.

To use adapters other than the OData adapter, you will also need to install the Data Provisioning Agent.

Related Information

[SAP HANA Smart Data Integration and SAP HANA Smart Data Quality Documentation](#)

3.4.1 Install the Optional SAP HANA Smart Data Integration Data Provisioning Agent for SAP HANA, express edition

Install the SAP HANA smart data integration data provisioning agent on an SAP HANA, express edition system.

Context

This installs the Data Provisioning Agent that provides connectivity between SAP HANA, express edition and your remote data sources.

i Note

The current version of SAP HANA, express edition supports only one Data Provisioning Agent per machine.

Procedure

1. Download dpagent_linux_x86_64.tgz.

Navigate to */usr/sap/<SID>/home/bin*:

```
cd /usr/sap/<SID>/home/bin
```

Enter the following command:

```
HXEDownloadManager_linux.bin linuxx86_64 installer dpagent_linux_x86_64.tgz
```

2. Extract `dpagent_linux_x86_64.tgz`.

Extract `dpagent_linux_x86_64.tgz`:

```
tar -xvzf dpagent_linux_x86_64.tgz
```

3. Install the Data Provisioning Agent.

Enter the following command:

```
HANA_EXPRESS_20/DATA_UNITS/HANA_DP_AGENT_20_LIN_X86_64/hdbinst
```

Set the installation path to `/usr/sap/<SID>/home/dataprovagent`, and press Enter to accept the default values for other prompts.

4. Connect to SAP HANA, express edition.

Set the `DPA_INSTANCE` environment variable to the installation path for the data provisioning agent:

```
export DPA_INSTANCE=/usr/sap/<SID>/home/dataprovagent
```

Start the configuration tool:

```
$DPA_INSTANCE/bin/agentcli.sh --configAgent
```

In the configuration tool menu, select **SAP HANA Connection** **Connect to SAP HANA on Premise (TCP)**, then enter the following values:

- **Use SSL:** false
- **Host Name:** `<hostname>`
- **Port Number:** `3<instance-number>15`
- **Agent Admin HANA User:** SYSTEM
- **Agent Admin HANA User Password:** `<master-password>`

Go back to the top level of the configuration tool menu, then select **Agent Registration** **Register Agent**. Press Enter to accept the default values.

5. Next steps.

After installation is complete, you will need to complete some other tasks to access and move data.

When you have completed the installation and connected to HANA, you will want to begin creating remote sources, and replicating or transforming your data.

For complete information about SAP HANA smart data integration, see the SAP Help Portal.

Related Information

[SAP HANA Smart Data Integration and SAP HANA Smart Data Quality Documentation](#)

3.5 Install the Optional SAP HANA External Machine Learning Library Package for SAP HANA, express edition

The SAP HANA External Machine Learning Library is an application function library (AFL) supporting the integration of Google TensorFlow, as an external machine learning framework, with SAP HANA, express edition.

Procedure

1. Download `eml.tgz`.

Use the Download Manager to download HANA External Machine Learning AFL, `eml.tgz`.

i Note

If you're using Download Manager (GUI Mode) make sure you're using the latest version.

Navigate to `/usr/sap/HXE/home/bin`:

```
/usr/sap/HXE/home/bin
```

Enter the following command:

```
./HXEDownloadManager_linux.bin linuxx86_64 installer eml.tgz
```

2. Extract `eml.tgz`.

Extract `eml.tgz`:

```
tar -xvzf eml.tgz
```

3. Run the installation script.

As the `<sid>adm` user, run:

```
<extracted_path>/HANA_EXPRESS_20/install_eml.sh
```

For more information on the SAP HANA External Machine Learning Library, see the [SAP HANA documentation collection](#).

4 Best Practices

4.1 Deactivate the SYSTEM User

SYSTEM is the database superuser and is not intended for day-to-day activities in production systems. For better security, you can create other database users with only the privileges that they require for their tasks (for example, user administration), then deactivate the SYSTEM user.

Procedure

1. In a terminal, log in as the `<sid>adm` user:

```
sudo su -l <sid>adm
```

2. Create a new admin user with the USER ADMIN system privilege:

```
/usr/sap/<SID>/HDB<instance-number>/exe/hdbsql -i <instance-number> -d  
SystemDB -u SYSTEM -p "<SYSTEM-password>" "CREATE USER <admin-username>  
PASSWORD <admin-password> NO FORCE_FIRST_PASSWORD_CHANGE;"  
/usr/sap/<SID>/HDB<instance-number>/exe/hdbsql -i <instance-number> -d  
SystemDB -u SYSTEM -p "<SYSTEM-password>" "GRANT USER ADMIN TO <admin-  
username> WITH ADMIN OPTION;"
```

3. Use the new admin user to deactivate the SYSTEM user:

```
/usr/sap/<SID>/HDB<instance-number>/exe/hdbsql -i <instance-number> -d  
SystemDB -u <admin-username> -p "<admin-password>" "ALTER USER SYSTEM  
DEACTIVATE USER NOW;"
```

4.2 Backups

Make regular data backups to save your work.

For information on data backup, recovery, and log file growth, see the [SAP HANA Administration Guide](#).

4.3 Set the Global Memory Allocation Limit

Set how much memory SAP HANA, express edition utilizes by modifying the `global_allocation_limit` parameter in the `global.ini` file.

The unit for `global_allocation_limit` is MB. The default value is 0, which sets the maximum memory to the minimum of your machine limit and license limit. If the machine size is less than 16 GB, the maximum memory is set to 16 GB.

If you set `global_allocation_limit` to a non-zero value, SAP HANA, express edition will use that value as maximum memory.

i Note

Do not set `global_allocation_limit` to a value above the limit of your license. This can cause database lockdown.

5 Updating SAP HANA, express edition

Update SAP HANA 2.0, express edition when new patches are released.

Prerequisites

If you are updating to SAP HANA, express edition 2.0 SP 02, the `libgcc_s1` and `libstdc++6` packages must be version 6.2 or newer. To update these packages, register your system with SUSE and run `zypper install libgcc_s1 libstdc++6`. For registration instructions, see the SUSE Linux Enterprise Server 12 documentation.

Procedure

1. Log in as `<sid>adm`.
2. Depending on your version of SAP HANA, express edition, you will either use the built-in update utility, or download the new versions of SAP HANA, express edition through the Download Manager. Your primary choice should be the built-in update utility.
 - Check the update utility found in the `~<sid>adm/bin` directory. For Linux x86-64, use `HXECheckUpdate_linux.bin`, and for Linux PPC64, use `HXECheckUpdate.jar`. Run one of these to check for, and download, the latest files. Follow the prompts to download the new files. By default, they will be downloaded to `/usr/sap/<sid>/home/Downloads`. The downloaded files will be `hxe.tgz` for the server installation, `hxexsa.tgz` for Applications if applicable, and additional files for any optional components you have installed.

```
HXECheckUpdate_linux.bin -a
```

- If you do not have the update utility, use the Download Manager, select Binary Installer and download the latest files for `hxe.tgz`, and `hxexsa.tgz` for Applications if applicable.
3. Extract all of the downloaded packages to the same directory.

```
cd <download_directory>
tar -zxf hxe.tgz
tar -zxf hxexsa.tgz
```

4. Navigate to the directory where you extracted the packages:

```
cd <extract_path>/HANA_EXPRESS_20/
```

i Note

If the update you are applying includes the Applications package, increase your allocated memory by 3.5 GB and run `./hxe_gc.sh`. Follow the prompts and then continue with the procedure.

5. As the root user, run the upgrade script to update the server:

```
sudo ./hxe_upgrade.sh
```

6. Follow the prompts to complete the update.

i Note

`hxe_upgrade.sh` detects the Server and Applications packages. The script will upgrade the server installation as well as XSA and optional components you have installed, if available.

i Note

Upgrading is supported only for SAP HANA, express edition 2.0 SP 00 and newer.

6 Uninstalling SAP HANA, express edition

6.1 Uninstalling SAP HANA, express edition

Procedure

- To completely uninstall SAP HANA, express edition:

- a. Enter the following command:

```
sudo ./hdblcm --uninstall --components=all
```

- b. Uninstall the SAP Host Agent:

```
sudo /usr/sap/hostctrl/exe/saphostexec -uninstall
```

- To uninstall one or more components:

- a. Start the hdblcm tool:

```
sudo /hana/shared/<SID>/hdblcm/hdblcm
```

- b. Select **uninstall**.
- c. Choose one or more components to uninstall.

6.2 Uninstalling the SAP HANA Client

Each installation of the SAP HANA Client has its own uninstallation tool.

Procedure

1. Use the `hdbuninst` command to uninstall the client software from your command prompt.

```
sudo <unzipped_filepath>/HDB_CLIENT_<version>/hdbuninst
```

2. Follow the onscreen instructions to uninstall the SAP HANA Client.

7 Troubleshooting

7.1 HDB Daemon Not Running

Issue: You are installing SAP HANA 2.0, express edition on a Linux server using `hdb1cm`. You receive this error:
Cannot start system. Start instance 00 on host 'hxehost.localdomain.com' failed.
FAIL: process hdbdaemon HDB Daemon not running.

Solution:

1. Use `zypper` to check the `util-linux`, `util-linux-systemd`, and `uuid` packages to make sure they are the correct versions:

```
zypper info util-linux util-linux-systemd uuid
```

The results need to show that you have at least the following versions installed:

- `util-linux: util-linux-2.25-22.1`
 - `util-linux-systemd: 2.25-22.1`
 - `uuid: uuid-2.25-22`
2. If you are missing any of the packages, or if the versions are outdated, install them using the `zypper install` command.
 3. Check that socket activation is enabled and started. In a shell, enter:

```
systemctl status uuid.socket
```

4. If the status is inactive, start socket activation:

```
systemctl start uuid.socket
```

7.2 SAP HANA XS Applications Run Error

Issue: You are trying to run an SAP HANA service on your SAP HANA 2.0, express edition installation and are receiving an error.

Solution: Log in to your SAP HANA 2.0, express edition as `<sid>adm`:

```
sudo su -l <sid>adm
```

Check which services are enabled on your machine:

```
xs apps
```

This operation may take 1-2 minutes to return the list of apps. You should see the following:

devx-ui5	STARTED	1/1	128 MB	<unlimited>	https://hxehost:51024
di-runner	STARTED	1/1	256 MB	<unlimited>	https://hxehost:51025
di-cert-admin-ui	STARTED	1/1	16.0 MB	<unlimited>	https://hxehost:51026
di-space-provisioning-ui	STARTED	1/1	16.0 MB	<unlimited>	https://hxehost:51027
webide	STARTED	0/1	512 MB	<unlimited>	https://hxehost:53075
jobscheduler-db	STOPPED	0/1	256 MB	<unlimited>	<none>
jobscheduler-rest	STOPPED	0/1	1.00 GB	<unlimited>	https://hxehost:51030

If the service you're trying to use is shown as `STOPPED`, start it:

```
xs start <app>
```

It may take a few minutes for the system to get started. Run `xs apps` again to see if the app has started and that under `instances` the app shows 1/1.

7.3 Download Manager Shows Error "Failed to concatenate downloaded files"

Issue: You are downloading packages using the Download Manager. The Status area and Progress Detail area show the error `Failed to concatenate downloaded files`.

Solution:

1. Check the log file for details. The log file is in the temp directory:
 - Linux: `/tmp/hxedm[yyymmdd].log`
 - Windows: `%TEMP%\hxedm_[yyymmdd].log`
2. If the log indicates a simple issue such as lack of disk space or file permissions, fix the problem and download again.
3. If the problem is less obvious, do the following:
 - Go to the Save directory. Delete incomplete download files. Download again.or
 - Change the Save directory. Download again.

7.4 Error When Accessing the Database Explorer from Cockpit

Issue: You get an error when opening the database explorer from cockpit.

Solution: Open the database explorer manually:

1. As the `<sid>adm` user, log in to XSA services:

```
xs-admin-login
```


At the prompt for the XSA_ADMIN password, enter the master password.

2. Get the URL for the `hrtt-core` application:

```
xs apps | grep hrtt-core
```

```
hxeadm@hxehost:/usr/sap/HXE/home/bin> xs apps | grep hrtt-core
hrtt-core          STARTED          1/1          512 MB      <unlimited>    https://hxehost:51012
```

3. Enter the URL for `hrtt-core` in a browser.
4. Log in as XSA_ADMIN.
5. Add the database using **SAP HANA Database (Multitenant)** as the database type.

Add Database

Database Type: **SAP HANA Database (Multitenant)**

*Host:

*Instance number:

Database: ☒ System database ☐ Tenant database Name:

*User:

*Password:

☐ Save user and password (stored in the SAP HANA secure store)

☐ Connect to the database securely using TLS/SSL (prevents data eavesdropping)

☒ Verify the server's certificate using the trusted certificate below

Advanced Options:

Name to Show in Display:

OK Cancel

7.5 Error When Stopping the System from Cockpit

Issue: You get an error when stopping the SAP HANA, express edition system from cockpit.

Solution: Stop the system manually.

As the <sid>adm user, enter:



```
HDB stop
```

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