Installation Guide | PUBLIC
SAP HANA 2.0, express edition 2.0 SPS 06
Document Version: 2.0.06 – 2022-05-15

Getting Started with SAP HANA 2.0, express edition (Virtual Machine Method)

THE BEST RUN SAP

Content

1 Getting Started with SAP HANA 2.0, express edition (Virtual Machine Method)

You will learn how to download the VM image of SAP HANA 2.0, express edition, install the image on your laptop, and get started.

1.1 Installing SAP HANA 2.0, express edition (Virtual Machine Method)

Perform pre-installation tasks, register the product, download the server and optional packages, and import the OVA file into your hypervisor.

1.1.1 Pre-Installation Tasks

The virtual machine (VM) installation method is the simplest SAP HANA 2.0, express edition on-premise installation method for compatible Windows, OS X, and Linux laptops. Perform these pre-installation tasks first, before you register.

Context

Procedure

1. Understand the Virtual Machine installation method.

   The SAP HANA 2.0, express edition VM image is platform-independent. You can install it to a Windows, OS X, or Linux machine, provided your laptop meets the storage and memory prerequisites. Choose the VM installation method if you want the simplest *on-premise* installation experience.

   > → Tip
   >
   > If you need a custom on-premise setup, use the Binary Installer Method, which is for Linux machines – running specific installations – that meet certain storage and memory prerequisites. See Getting Started with SAP HANA 2.0, express edition (Binary Installer Method).

   The Virtual Machine method installs:

- A VM running `SUSE Linux Enterprise Server (SLES) for SAP Applications 12 SP2`.
- An SAP HANA 2.0, express edition instance on the VM, preconfigured and ready to start.

You can download two different installation packages depending on your requirements:

- A *server-only virtual machine package*: the server plus XSC, and the Application Function Library (AFL).
- A *server + applications virtual machine package*: the server and XS Advanced, Web IDE, and SAP HANA Cockpit. This package requires more RAM.

> **i Note**
>
> SAP HANA 2.0, 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*, *Fedora*, and *RedHat*. SAP is not committing to resolving any issues that may arise from running SAP HANA, express edition on these platforms.

2. Note changes from version 1.0.

   If you're familiar with the older 1.0 SPS 12 version, note this important change:

   - The instance number has changed from 00 to 90.

   See the release notes for information on what's new and changed in this release of SAP HANA 2.0, express edition.

3. Ensure your laptop meets the software requirements.

   Check if your laptop has the recommended software to successfully install and run the SAP HANA 2.0, express edition VM package.

Requirement	Details
Java Runtime Environment 8	The Download Manager requires Java SE Runtime Environment 8 (JRE 8) or higher. You can download the SAP JVM (64-bit) from https://tools.hana.ondemand.com/#cloud.

> **i Note**
>
> If you plan to use the SAP HANA, express edition Download Manager for Windows or Linux, you need the **64-bit JRE**. If you are planning to use the platform-independent Download Manager, you can use either the **32-** or **64-bit** JRE.

4. Ensure your laptop meets the hardware requirements.

   Check if your laptop has the recommended software to successfully install and run the SAP HANA 2.0, express edition VM package.

Requirement	Details
RAM - Server-only virtual machine	8 GB RAM minimum. (If you add additional components, or run heavy processing loads, you will need to increase your RAM.)

Requirement	Details
RAM - Server plus applications virtual machine	16 GB RAM minimum. 24 GB RAM recommended.
HDD	120 GB HDD recommended.
Cores	4 cores.
Hardware Virtualization	(Intel processors only) For Intel processors, virtualization is a BIOS setting known as either Intel Virtualization Technology or Intel VT. If virtualization is turned off on your virtualization-capable machine, consult documentation from your machine vendor on how to enable virtualization technology (or Intel VT) in the BIOS.

Go to Determine If Your Processor Supports Intel Virtualization Technology to determine if your processor is capable of supporting virtualization.

> → Tip
>
> Concerned about memory? The memory consumption of each optional component is listed in the SAP HANA 2.0, express edition Sizing Guide (Virtual Machine Method).

5. Install a hypervisor.

   Hypervisors are software products used for creating and running virtual machines. Install a supported hypervisor on your laptop if you don't have one already. SAP HANA 2.0, express edition has been tested on these hypervisors:

   - *VMware Workstation Player 16.0* - https://my.vmware.com/web/vmware/downloads
   - *VMware Workstation Pro 16.0* - https://my.vmware.com/web/vmware/downloads
   - *VMware Fusion 11x, 12.x* - https://my.vmware.com/web/vmware/downloads

   Example installation procedure for *VMware Workstation Player*:

   1. Download *VMware Workstation Player*. Ensure you're downloading the correct version for your machine.
   2. Run the installer.
   3. Register *VMware Workstation Player* when prompted, and follow the setup instructions.

1.1.2 Register

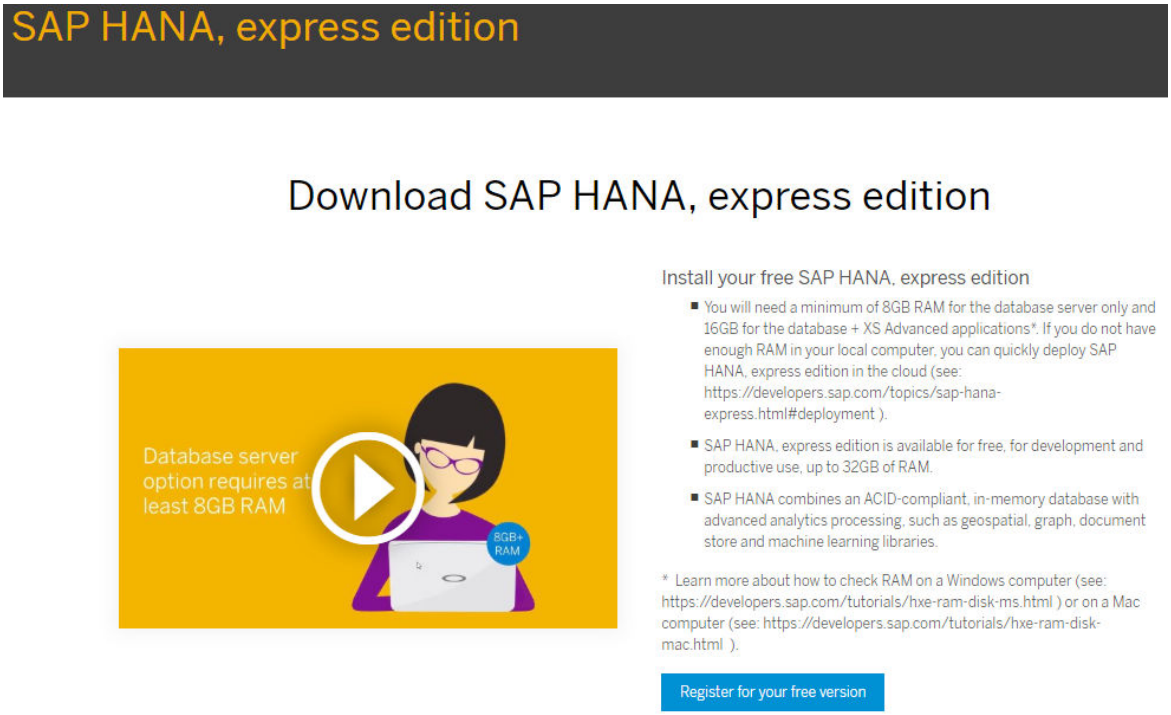
Register your copy of SAP HANA, express edition to access the download manager.

Procedure

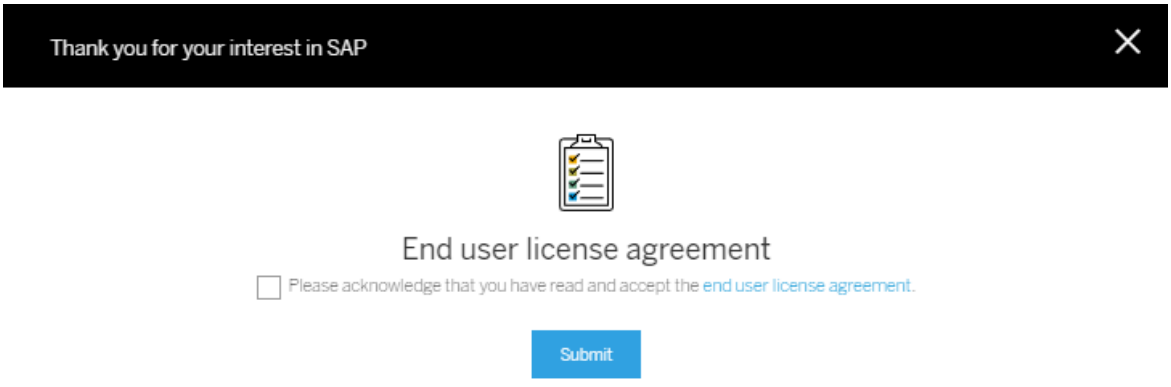
1. Complete the registration form.

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.

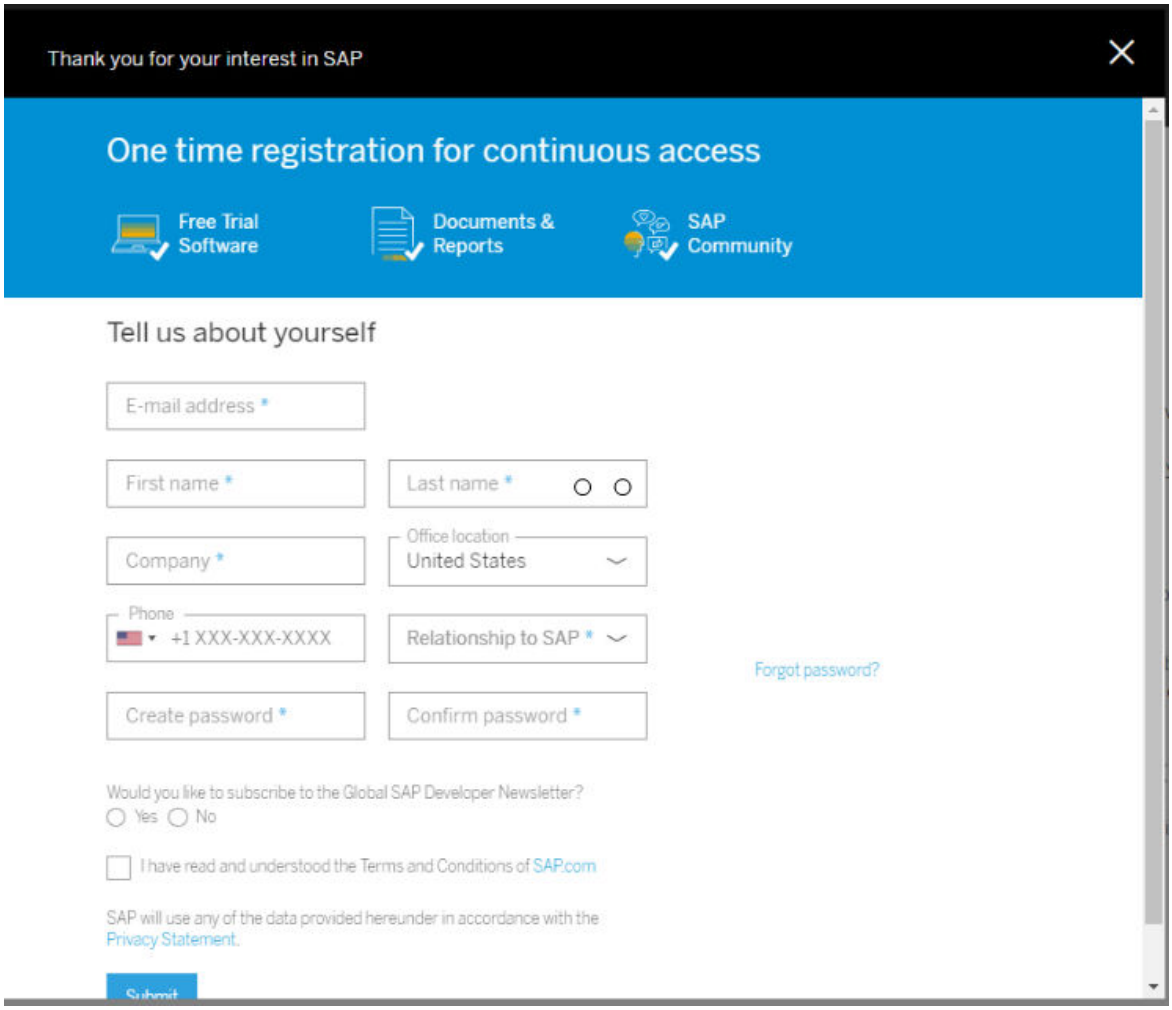


Read and accept the end user license agreement, and then click the **Submit** button.



The registration form displays.

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



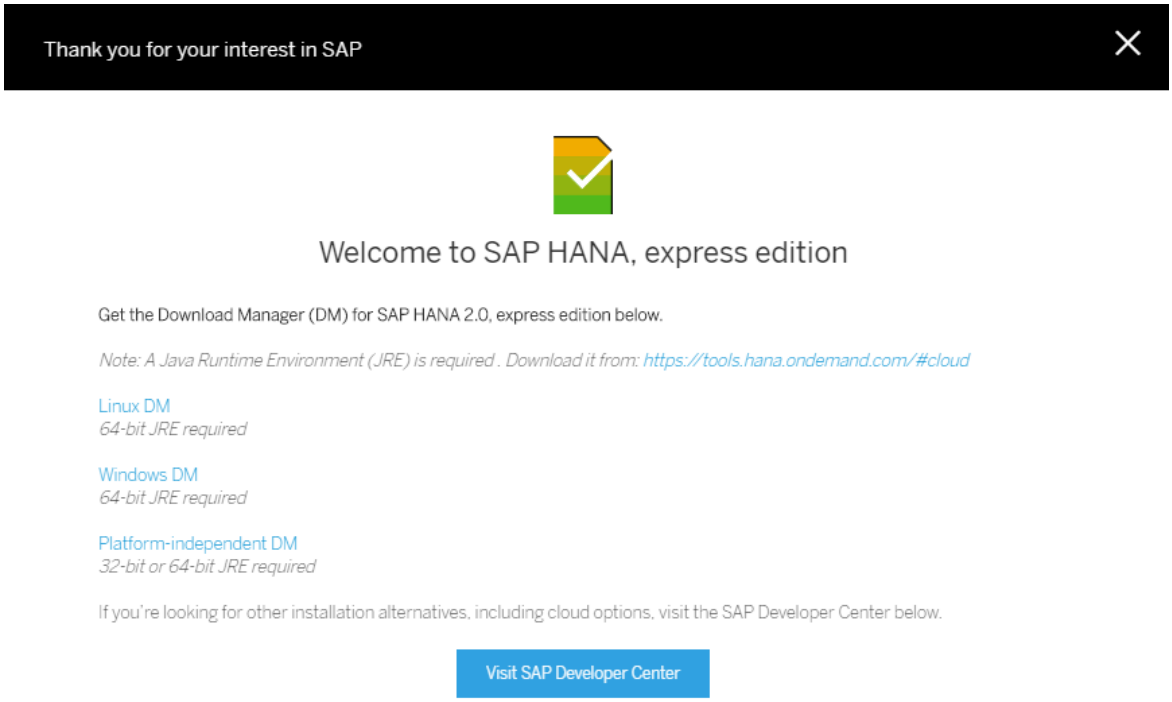
> ### i Note
>
> If you have an SAP login, click the Login icon at the top of the page to populate the registration form automatically.

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**.

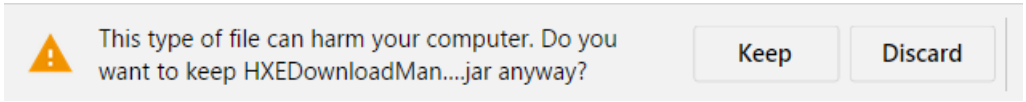
   If you have a Mac, or another type of machine, click **Platform-independent DM** for a platform-independent download manager.



> **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.

1.1.3 Download Using the Download Manager (GUI Mode)

Use the Download Manager (GUI mode) to download a server-only virtual machine package, or a server + applications virtual machine package.

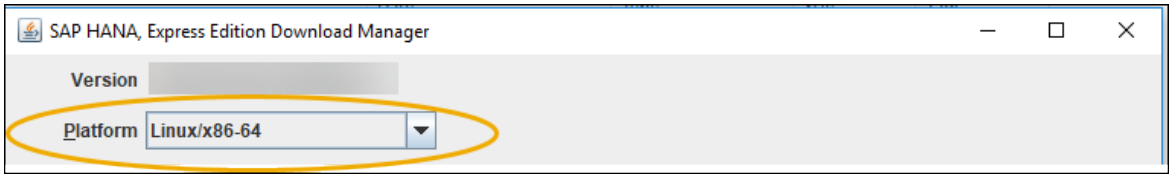
Context

You can also download **optional** installation packages (like the SAP Enterprise Architecture Designer Package) at this point in your installation, before you've started the server. However, SAP does not recommend downloading optional installation packages until **after** your server is installed and running.

Procedure

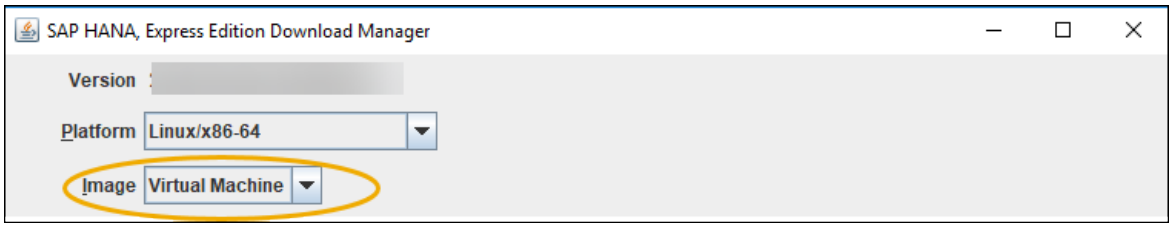
1. Select the Linux/x86-64 platform.

   In Download Manager, from the **Platform** pull-down, select SAP HANA, express edition on *Linux/x86-64*. (Virtual machine method installation is not available for **Linux/Power (little endian)**.)



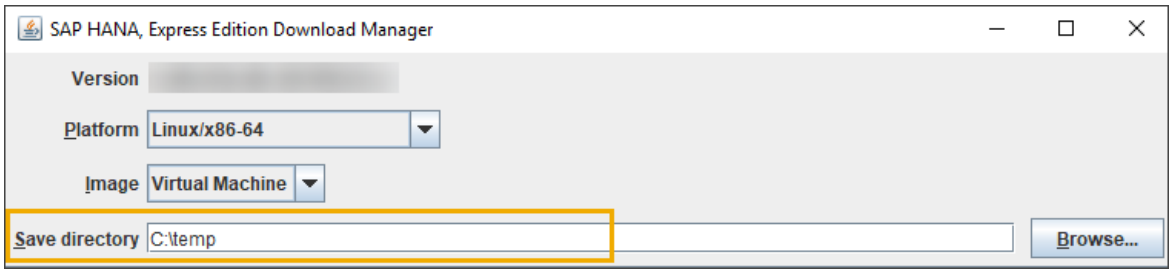
2. Select the VM image.

   From the **Image** pull-down, select **Virtual Machine**.



3. Specify a save directory.

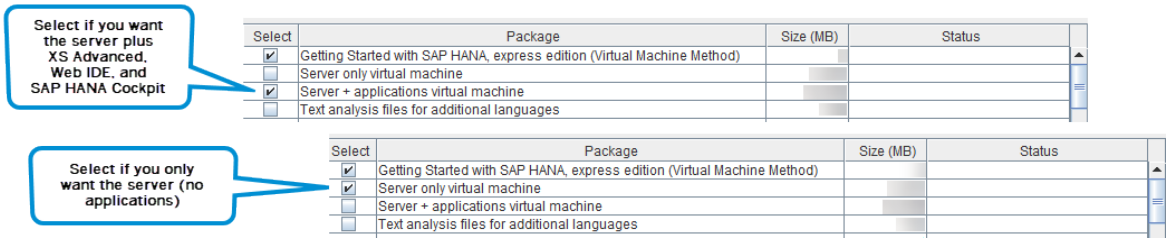
   Click **Browse** and select a directory where your downloads will be saved.



4. Select an OVA and user guide.

   Select one or more of the following packages:

Package	Description
Getting Started with SAP HANA, express edition (Virtual Machine Method)	Selected by default. Downloads this document.
Server + applications virtual machine	Downloads *hxexsa.ova*; the server plus XS Advanced, Web IDE, and SAP HANA Cockpit.
Server only virtual machine	Downloads *hxe.ova*; the server without any applications.



> **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).

5. (Optional) Download optional installation packages.

   Skip to the next step unless you are an advanced user.

> **i Note**
>
> SAP recommends beginners complete the installation process first, and then download optional installation packages **after** your server is installed and running. Downloading packages after installation is faster and easier, and uses the server's built-in Download Manager (console mode). For instructions on downloading optional installation packages **after** your server is installed and running, see Installing Optional Packages [page 38].

   If you choose to download optional installation packages now (before your server is running), note that you will need to transfer the installation files to your VM once downloaded. Transfer instructions vary depending on your hypervisor, and are not included in this documentation.

> → Tip
>
> Concerned about memory? The memory consumption of each additional package is listed in the SAP HANA 2.0, express edition Sizing Guide (Virtual Machine Method).

If downloading optional installation packages now, select one or more of the following:

- **Text analysis files for additional languages** - Downloads `additional_lang.tgz`. 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 **Server only virtual machine** and **Server + applications virtual machine** packages.) For the text analysis files installation procedure, see Install the Optional Text Analysis Files Package for SAP HANA, express edition [page 38].
- **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. Download file name is `eml.tgz`.
- **SAP HANA Automated Predictive Library** - 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 through a set of functions. Download file name is `apl.tgz`.
- **Clients (Linux x86/64)** - 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. See Install the Optional Clients Package for SAP HANA, express edition [page 41]. The package includes:
  - `hdb_client_linux.tgz` - Reduced HANA client for Linux 64 bit. Contains the HANA client package, drivers, and required licenses.
  - `xs.onpremise.runtime.client_linuxx86_64.zip` - Command-line tools for Linux that enable access to (and control of) the SAP HANA XS advanced run-time environment.
- **Clients (Linux PPC/Little Endian)** - 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. See Install the Optional Clients Package for SAP HANA, express edition [page 41]. The package includes:
  - `hdb_client_linux_ppc64le.tgz` - Reduced HANA client for Linux on Power. Contains the HANA client package, drivers, and required licenses.
  - `xs.onpremise.runtime.client_linuxppc64le.zip` - Command-line tools for Linux on Power that enable access to (and control of) the SAP HANA XS advanced run-time environment.
- **Clients (Windows)** - Client download package for Windows machines. Use the client packages to access developed SAP HANA, express edition applications from a client PC. See Install the Optional Clients Package for SAP HANA, express edition [page 41]. The package includes:
  - `hdb_client_windows_x86_32.zip` - Reduced HANA client for Windows 32-bit. Contains the HANA client package, drivers, and required licenses.
  - `hdb_client_windows_x86_64zip` - Reduced HANA client for Windows 64-bit. Contains the HANA client package, drivers, and required licenses.
  - `xs.onpremise.runtime.client_ntamd64.zip` - Command-line tools for Windows that enable access to (and control of) the SAP HANA XS advanced run-time environment.
- **Clients (Mac)** - Client download package for Mac. Use the client packages to access developed SAP HANA, express edition applications from a client PC. See Install the Optional Clients Package for SAP HANA, express edition [page 41]. The package includes:
  - `hdb_client_mac.tgz` - Reduced HANA client for Mac. Contains the HANA client package, drivers, and required licenses.

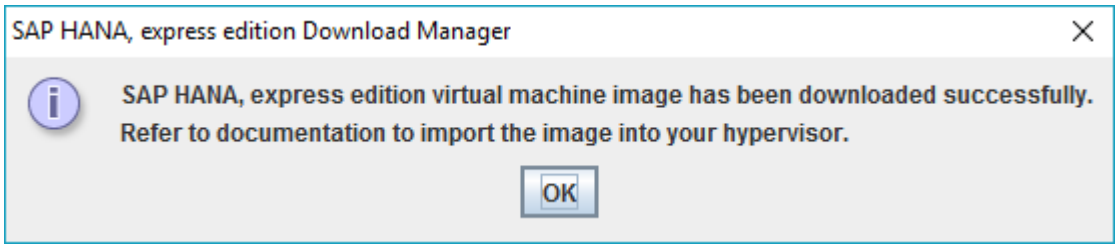
- `xs.onpremise.runtime.client_darwinintel64.zip` - Command-line tools for Mac that enable access to (and control of) the SAP HANA XS advanced run-time environment. - Reduced HANA client for Mac. Contains the HANA client package, drivers, and required licenses.

- **SAP HANA smart data integration** - 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.
  Download file name is `sdi.tgz`. See Install the Optional SAP HANA Smart Data Integration Package for SAP HANA, express edition [page 52].
- **SAP HANA smart data integration - Data Provisioning Agent (Linux X86/64)** - The Data Provisioning Agent provides secure connectivity between the SAP HANA database and your adapter-based sources. Download file name is `dpagent_linux_x86_64.tgz`. See Install the Optional SAP HANA Smart Data Integration Package for SAP HANA, express edition [page 52].

6. Download your selections.

   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.



Related Information

(Optional) Download Using the Download Manager (Console Mode) [page 13]

1.1.4 (Optional) Download Using the Download Manager (Console Mode)

Run the Download Manager in console mode on your laptop if you're used to a command line interface. Also, the SAP HANA, express edition server contains a built-in `HXEDownloadManager_linux.bin` (Console Mode) which lets you download additional packages from within the VM itself.

Prerequisites

If the Download Manager (GUI Mode) is running, close it.

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 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 using the Virtual Machine method, call the Download Manager at the `hxehost:hxeadm>` prompt.

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

   Linux 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

Argument	Description
-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 for **`linuxx86_64`** platform and VM image:

<file> value (linuxx86_64)	Description
`Getting_Started_HANAexpress_VM.pdf`	User manual in PDF format: *Getting Started with SAP HANA, express edition (Virtual Machine Method).*
`hxe.ova`	Downloads *hxe.ova*; the server plus XSC and Application Function Library (AFL).
`hxexsa.ova`	Downloads *hxexsa.ova*; the server plus XS Advanced, Web IDE, and SAP HANA Cockpit.
`additional_lang.tgz`	Downloads `additional_lang.tgz`. 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 *hxe.ova* and *hxexsa.ova* packages.) For installation steps, see Start Using SAP HANA 2.0, express edition (Virtual Machine Method) [page 19].
`eml.tgz`	Downloads HANA Extended Machine Learning AFL.
`apl.tgz`	Downloads SAP HANA Automated Predictive Library.
`clients_linux_x86_64.tgz`	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 41].

<file> value (linuxx86_64)	Description
clients_linux_ppc64le.tgz	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 41].
clients_windows.zip	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 41].
clients_mac.tgz	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 41].
sdi.tgz	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 52].
dpagent_linux_x86_64.tgz	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 52].

4. Download one or more files.

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

   It downloads *Getting Started with SAP HANA, express edition (Virtual Machine Method)* and `hxexsa.ova`.

```
java -jar HXEDownloadManager.jar linuxx86_64 vm
Getting_Started_HANAexpress_VM.pdf hxexsa.ova
```

1.1.5 Import the OVA

Import the downloaded Open Virtual Appliance (OVA) file into your hypervisor to begin using SAP HANA 2.0, express edition.

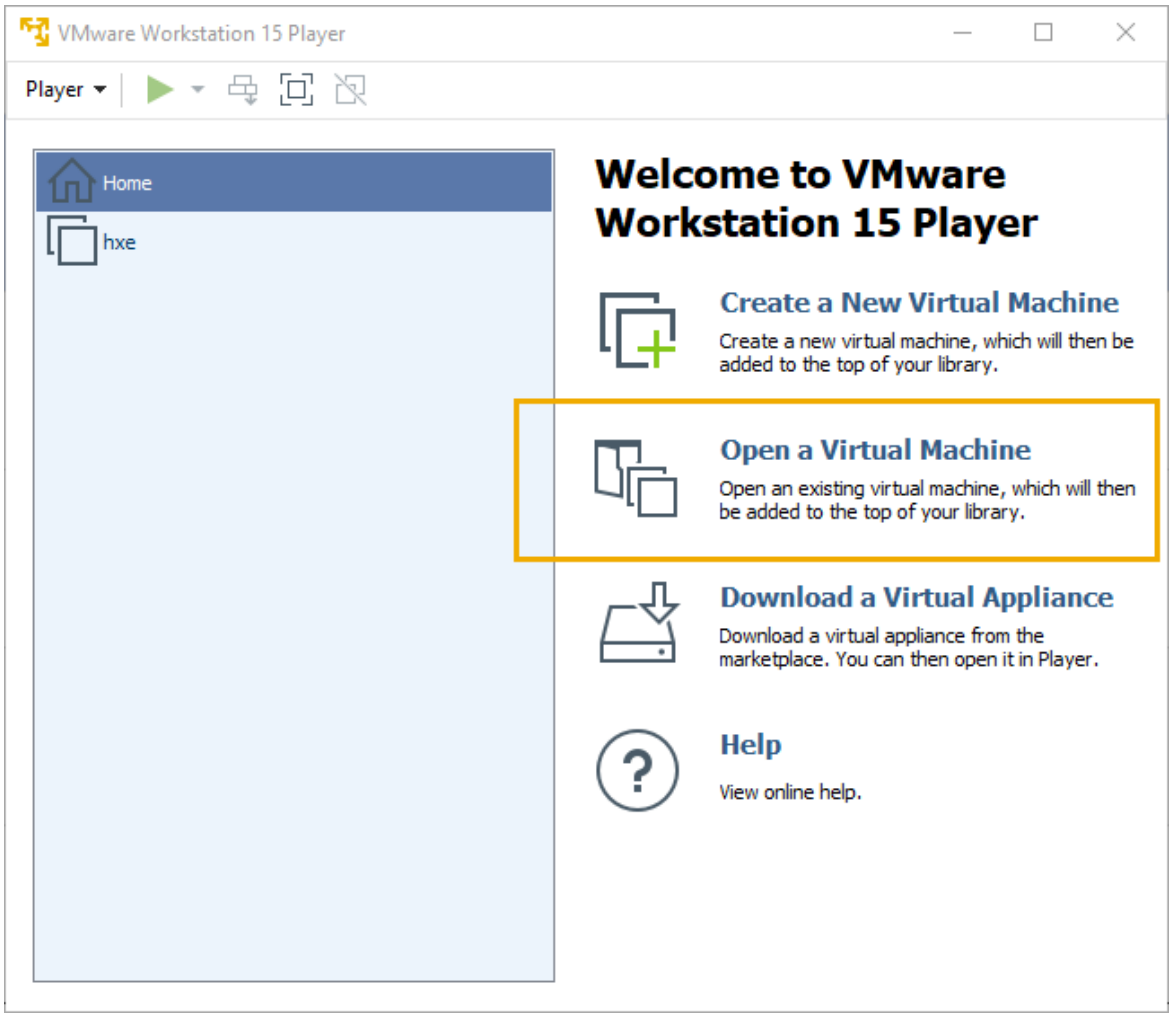
Context

This example uses *VMware Player* as the hypervisor. You can use any supported hypervisor.

Procedure

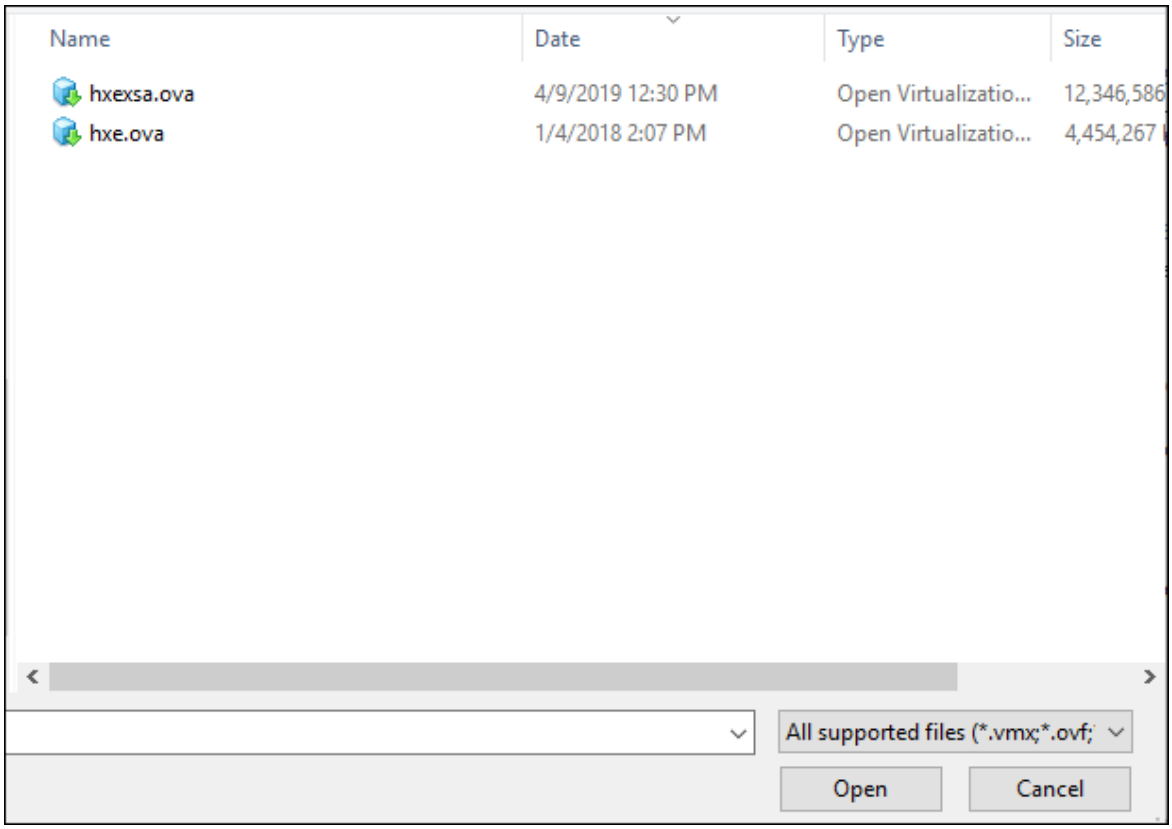
1. Open an existing virtual machine.

   Start *VMware Player* and select **Open a Virtual Machine**.



2. Open the OVA file.

   The OVA file name is either *hxexsa.ova* or *hxe.ova* depending on which VM image you downloaded.

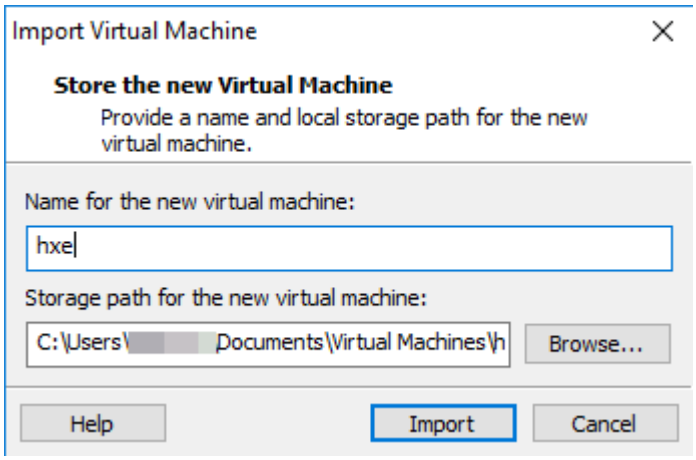


   Browse to the OVA file you downloaded and click **Open**.

   The Import Virtual Machine dialog box displays.

3. Import the VM.

   Accept the defaults and click **Import**. The VM imports.



   The import process takes approximately 5 minutes for *hxe.ova*.

   The import process takes approximately 5-10 minutes for *hxexsa.ova*.

4. Power on your VM.

   Click **Play Virtual Machine**.

1.2 Start Using SAP HANA 2.0, express edition (Virtual Machine Method)

Once you've downloaded the SAP HANA 2.0, express edition Virtual Machine package, start the server, change the default passwords to secure your system, and connect using client tools.

1.2.1 Set Keyboard and Time Zone

The VM defaults to an English (US) QWERTY keyboard, and the UTC time zone. When prompted, change the keyboard layout and time zone to match your location, or accept the defaults.

Context

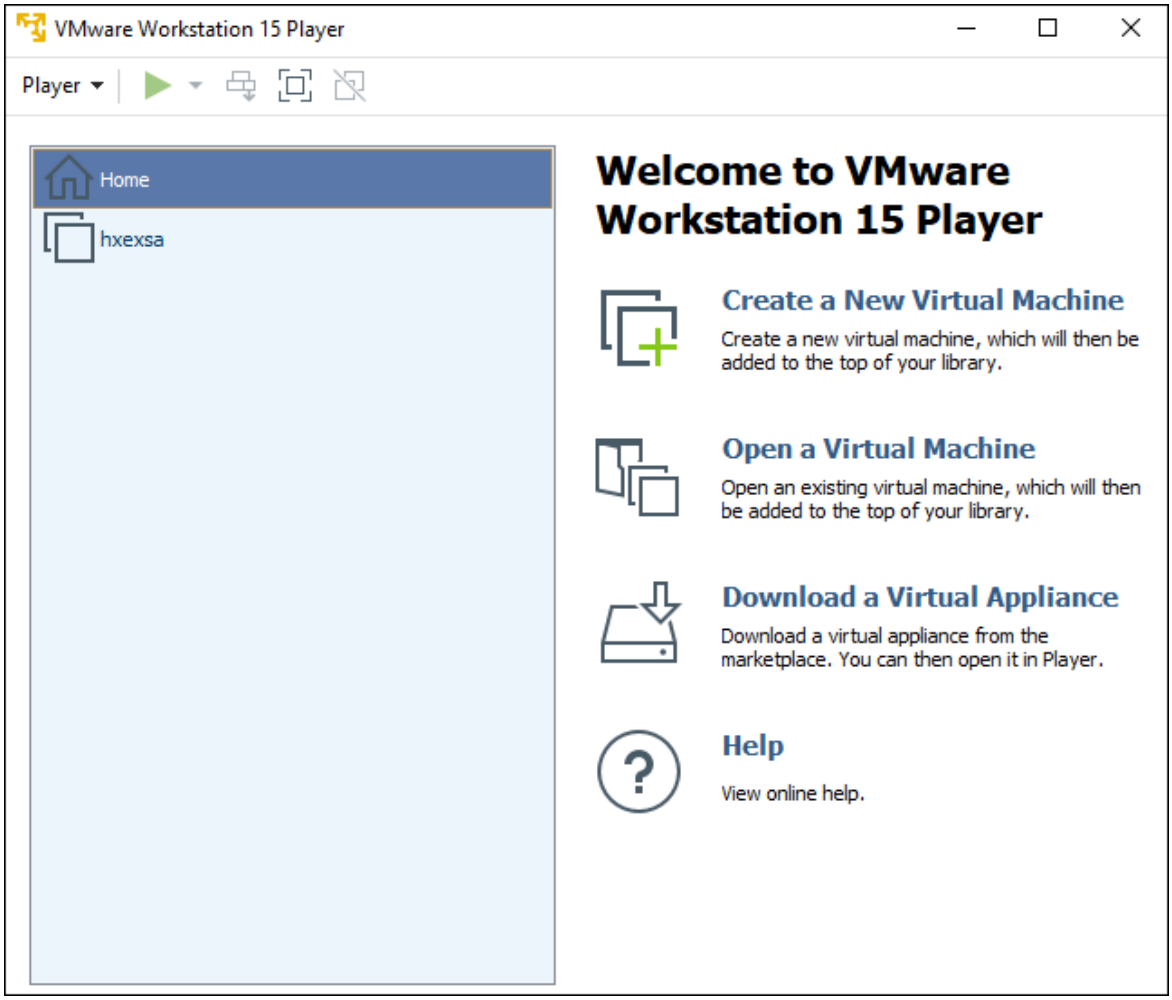
If you don't change the keyboard layout to match the physical keyboard of your host machine (referred to as your **laptop** in this documentation), you may encounter problems later when logging in.

Procedure

1. Start your VM.

   Open your hypervisor application.

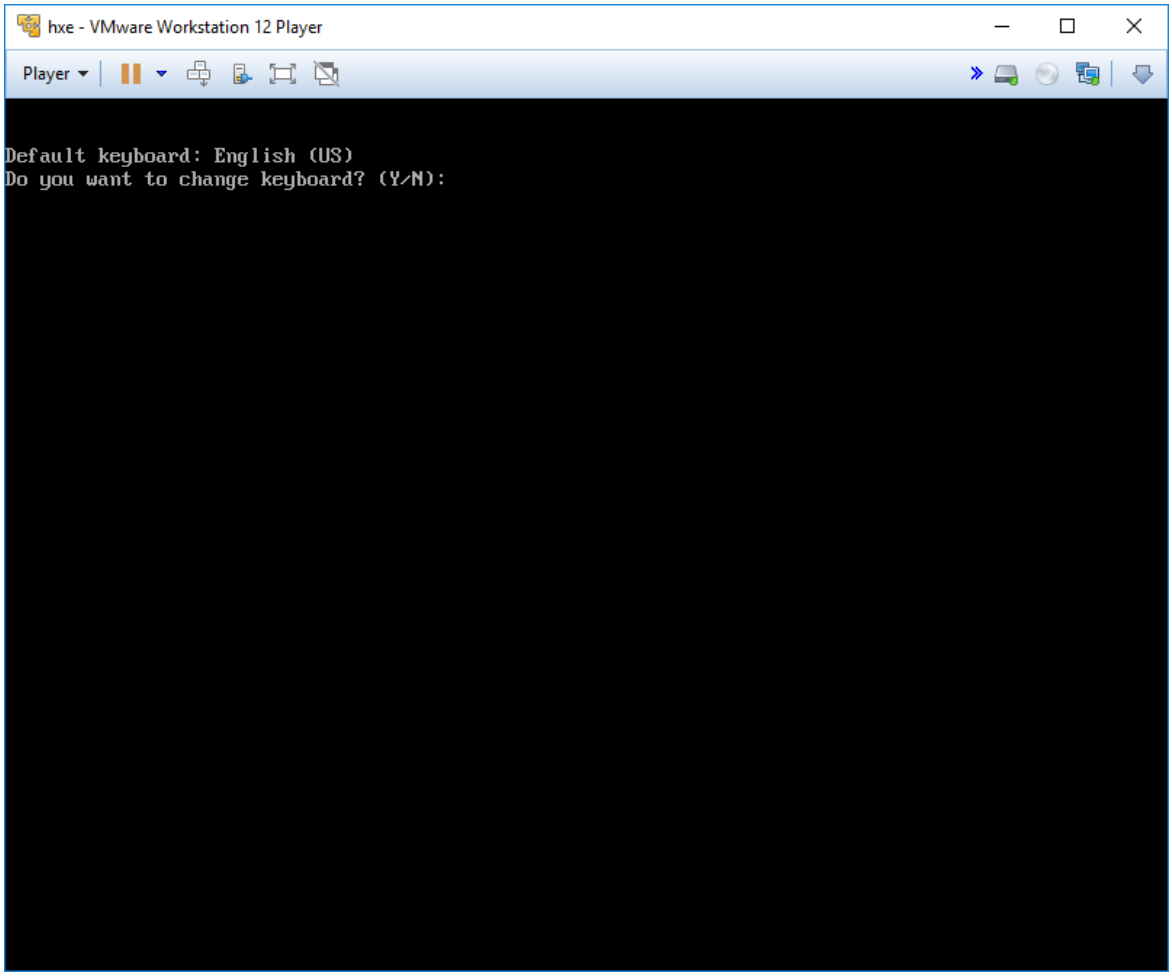
   Power on (or click **Play** on) your SAP HANA 2.0, express edition VM.



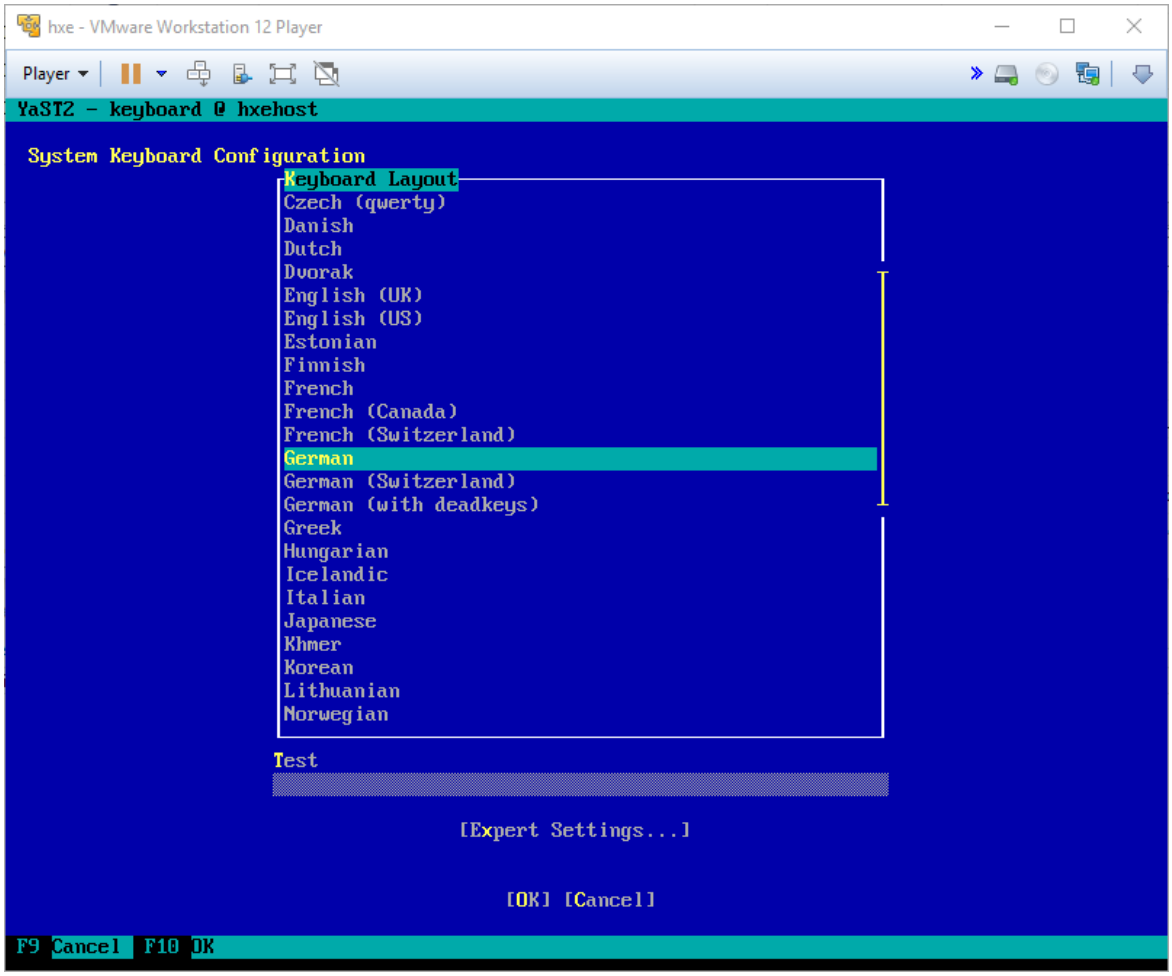
2. Change the keyboard layout if your laptop doesn't use an English (US) keyboard.

   The system prompts you to either change the VM keyboard, or accept the default English (US) QWERTY keyboard. Enter `Y` to change the keyboard or `N` to use the default.

> → Tip
>
> Having difficulty entering text in your virtual machine in VMWare? Press `CTRL` + `G` to switch the focus from your host machine to the VM.



If you opt to change the keyboard, the System Keyboard Configuration page displays.



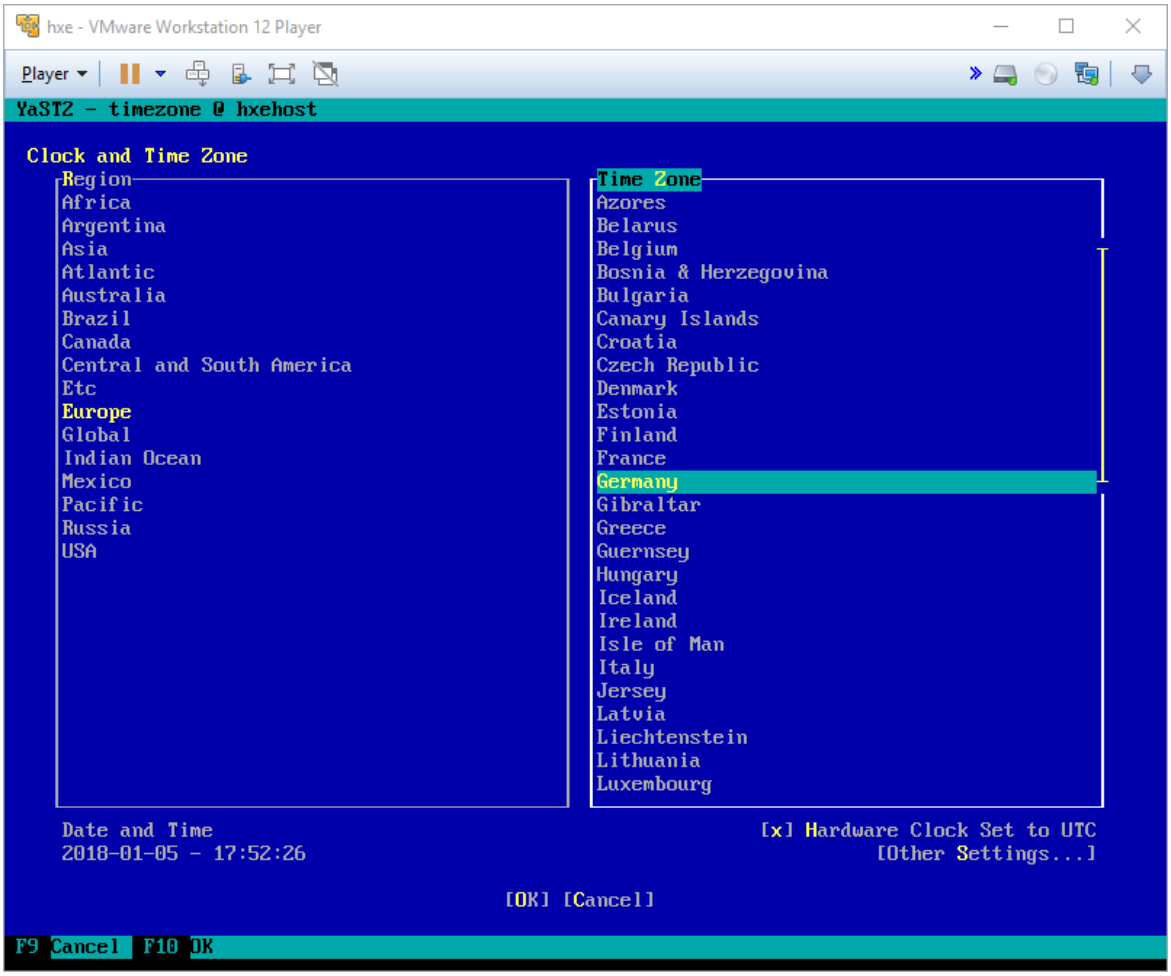
Use the arrow keys to scroll to the desired keyboard layout. `Tab` to the **OK** button, or press `F10`, to save your changes. A message displays while the system processes the keyboard layout change.

3. Change time zone.

   Change the time zone if your laptop is not in the default UTC (GMT) time zone.

   Enter `Y` to change the time zone, or `N` to accept the default.

   If you opt to change the timezone, the Clock and Time Zone page displays.



In the Region pane, use the arrow keys to scroll down to the correct region. `Tab` to the Time Zone pane and select the correct time zone. `Tab` to the **OK** button, or press `F10`, to save your changes.

1.2.2 Start SAP HANA, express edition Server

Once you've downloaded the server + applications SAP HANA 2.0, express edition Virtual Machine package and set the keyboard and time zone, log in and change the default passwords to secure your system.

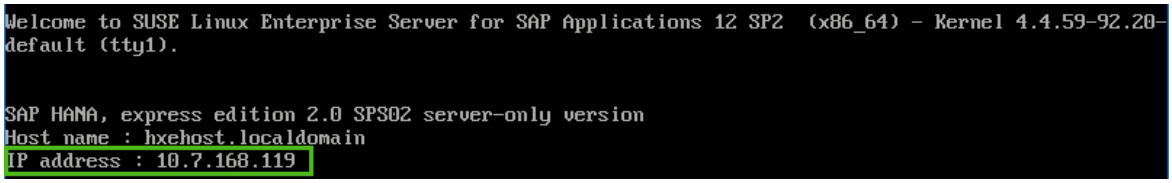
Context

This is an on-premise installation tutorial. Other installation methods are available. See https://developers.sap.com/topics/sap-hana-express.resources.html#details.

Procedure

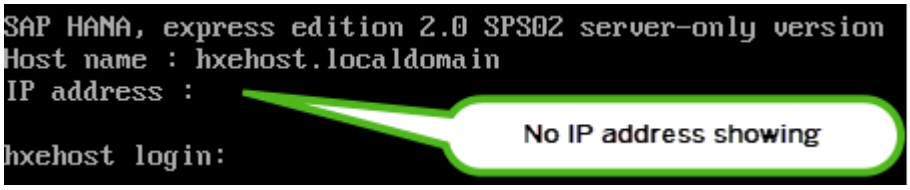
1. Note the VM IP address.

   The IP address of the VM is displayed on the login screen. Make a note of the IP address, since you'll need it in future steps.

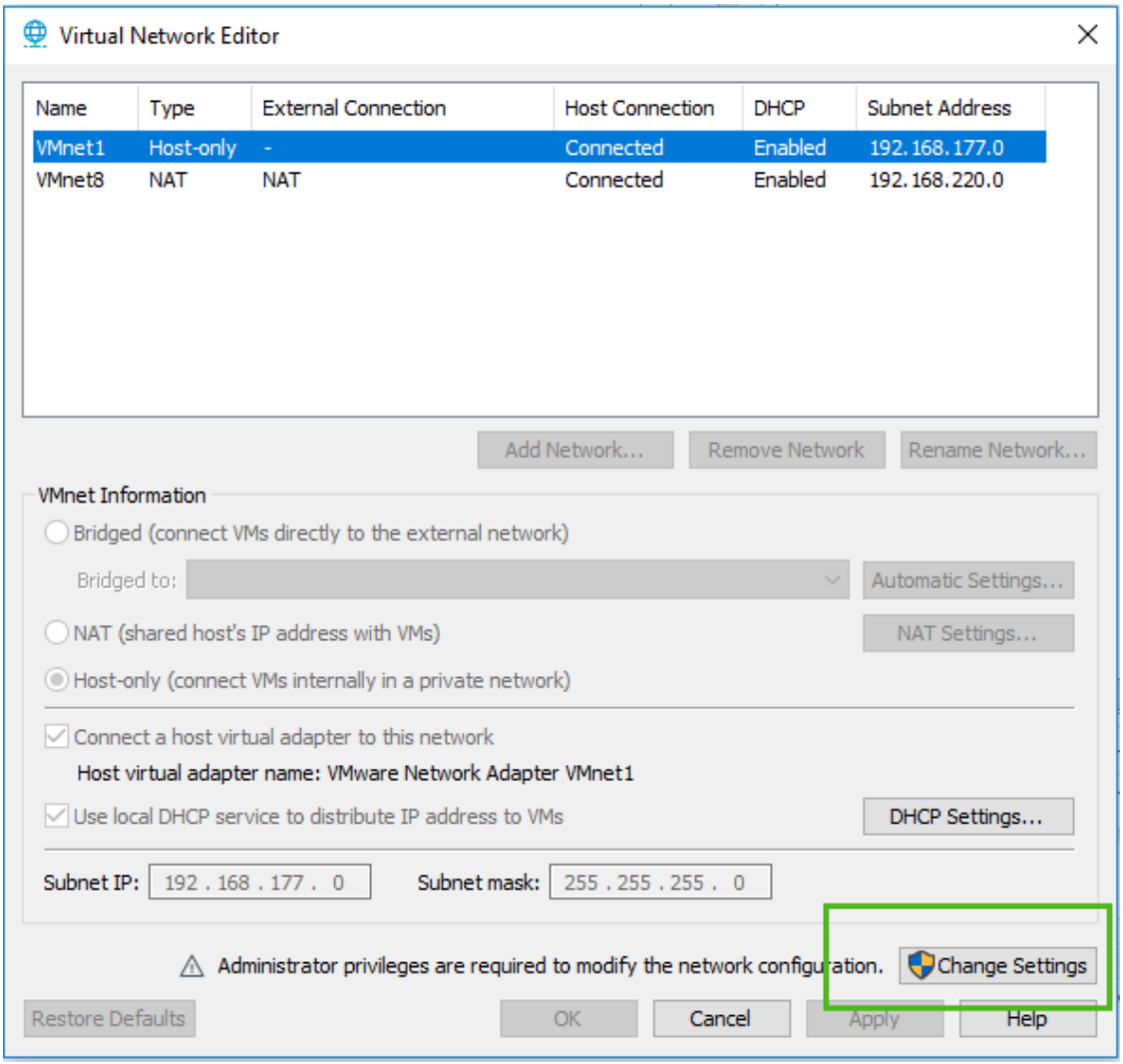
   > ### Note
   >
   > If the IP address and other information in this image does not show, wait few seconds and press `Enter`.

2. (Optional) Repair VMWare bridge networking.

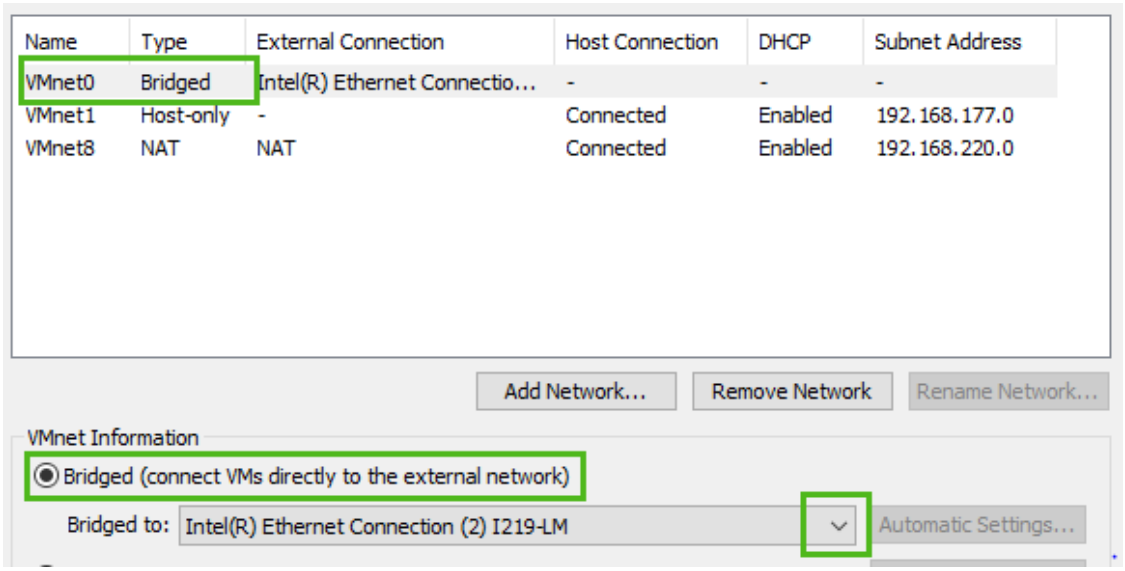
   

   If you are using a VMWare product, and if the IP address still doesn't show after one minute, you may have a VMWare bridge networking problem. If your system has several network adapters, VMWare can sometimes assign the incorrect adapter to the network connection designed for bridge networking – **VMNet0**. This prevents the IP address from displaying. Use the procedure in this step to troubleshoot bridge networking for **VMNet0**. If the IP address displays normally, skip to the next step.

   1. Download and install VMWare Workstation Pro 15. A free 30-day evaluation edition is available. Restart your host machine.
   2. Open the Virtual Network Editor (`vmnetcfg.exe`) application from the Windows **Start** menu, or from `C:\Program Files (x86)\VMware\VMware Workstation`.



3. Click the **Change Settings** button. Bridged connections show.



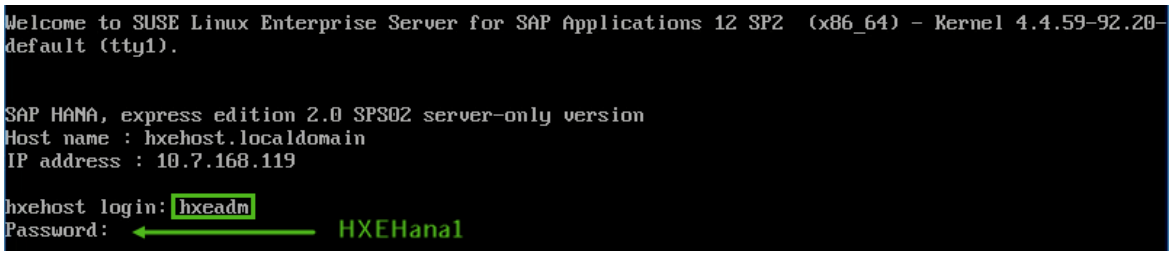
4. Check that **VMNet0** shows at the top of the list. Under **VMNet Information**, select **Bridged**. From the **Bridged to** list, select the correct network adapter.
5. Click **Apply** and **OK** to save your corrected bridge networking values.
6. Exit Virtual Network Editor.
7. Exit your virtual machine.
8. Restart your host machine.
9. Restart SAP HANA, express edition and go back to the very beginning of this *Start SAP HANA, express edition Server* procedure.

3. Log in.

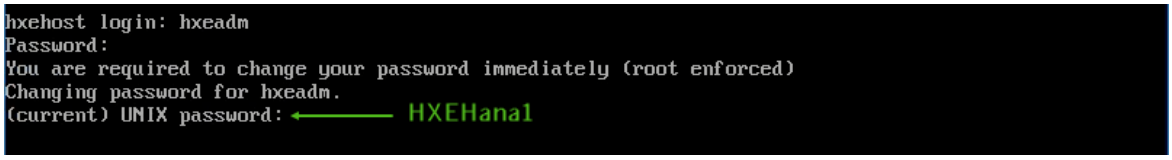
   At the *hxehost* **login** prompt, enter `hxeadm`.

   For **Password**, enter the temporary password `HXEHana1`.

   > **i** Note
   >
   > Is VMWare not recognizing your keyboard inputs? Press `CTRL` + `G` to redirect keyboard and mouse input to your VM.



   When prompted for **(current) UNIX password**, enter the temporary password again: `HXEHana1`



   > **i** Note
   >
   > When entering a password, the cursor doesn't move, and placeholder characters don't show. Don't worry – your password is being entered even though it may look like nothing is happening.

4. Enter new password.

   When prompted for **New password**, enter a strong password with at least 8 characters. If your password is not strong enough, the system logs you off and you must log in again.

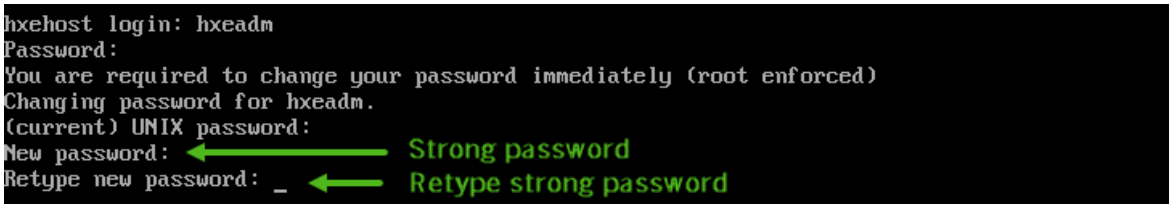
   > **→** Tip
   >
   > SAP HANA, express edition requires a *very strong password* -- even stronger than other editions of SAP HANA. Your password must comply with these rules:
   >
   > - At least 8 characters
   > - At least 1 uppercase letter
   > - At least 1 lowercase letter
   > - At least 1 number

- 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

Strong password example: *E15342GcbaFd*. Do not use this password example, since it is public and not secure. This example is for illustrative purposes only and must not be used on your system. Define your own strong password.

5. Retype new password.

   When prompted to **Retype new password**, enter your strong password again.



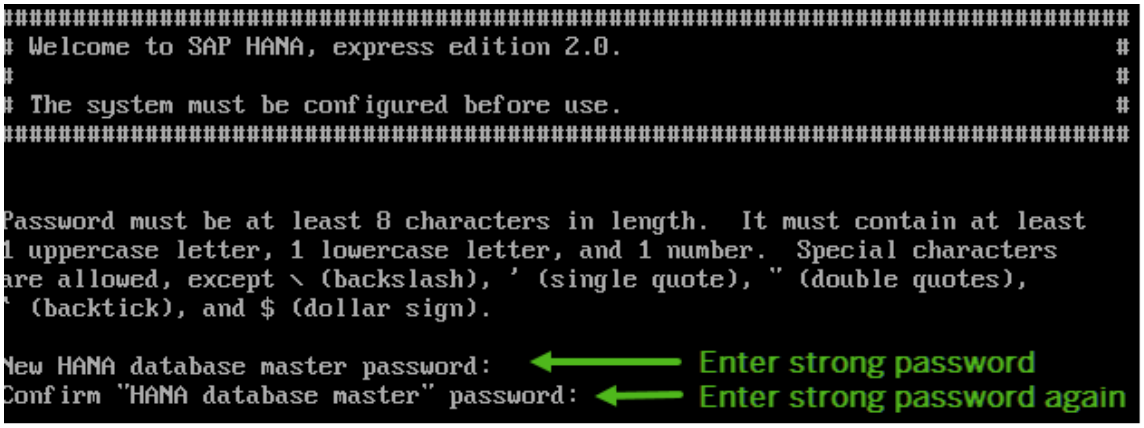
6. Enter new HANA database master password.

   When prompted for **New HANA database master password**, enter a strong password. Make a note of this password, since you'll need it later. You can enter the same password you used in step 4, or a new password. If you are entering a new password, see the password rules in step 4.

   Entering the HANA database master password changes the SYSTEM user password. If you are installing the *server + applications virtual machine*, it also changes the `XSA_ADMIN` and `XSA_DEV` user passwords.

7. Confirm HANA database master password.

   When prompted to **Confirm "HANA database master password"**, enter the strong password again.



8. Enter proxy settings.

   When prompted **Do you need to use the proxy server to access the internet?** enter Y or N.

   - Contact your IT administrator for your company's proxy settings. If you are inside a corporate firewall, you might use a proxy for connecting to http and https servers.
   - If `Y`, enter your proxy host name, proxy port number, and (if desired) a comma-separated list of hosts that do not need a proxy. Proxy host name needs a fully qualified domain name.
   - Make sure the Non Proxy Host list includes *localhost*, *hxehost*, and *hxehost.localdomain*.

9. (Server + Applications VM Only) Wait for XSA configuration.

   Decide whether you want to wait for XSA configuration to complete before starting the server. When prompted to **Wait for XSA configuration to finish**, enter **Y** if you want to wait.

   Enter **N** if you want XSA to configure in the background after server configuration completes.
10. Complete the installation.

    When prompted to **Proceed with configuration?** enter `Y`.

    Wait for the success message **Congratulations! SAP HANA, express edition 2.0 is configured.**

    SAP HANA 2.0, express edition is now running.

    > **i** Note
    >
    > If the success message does not display, does this line appear in your system output?
    >
    > ```
    > Fail to retrieve certificate.
    > ```
    >
    > If you see this message, you might have a problem with VMWare bridge networking configuration. See step 2.

1.2.3 Edit the Hosts File

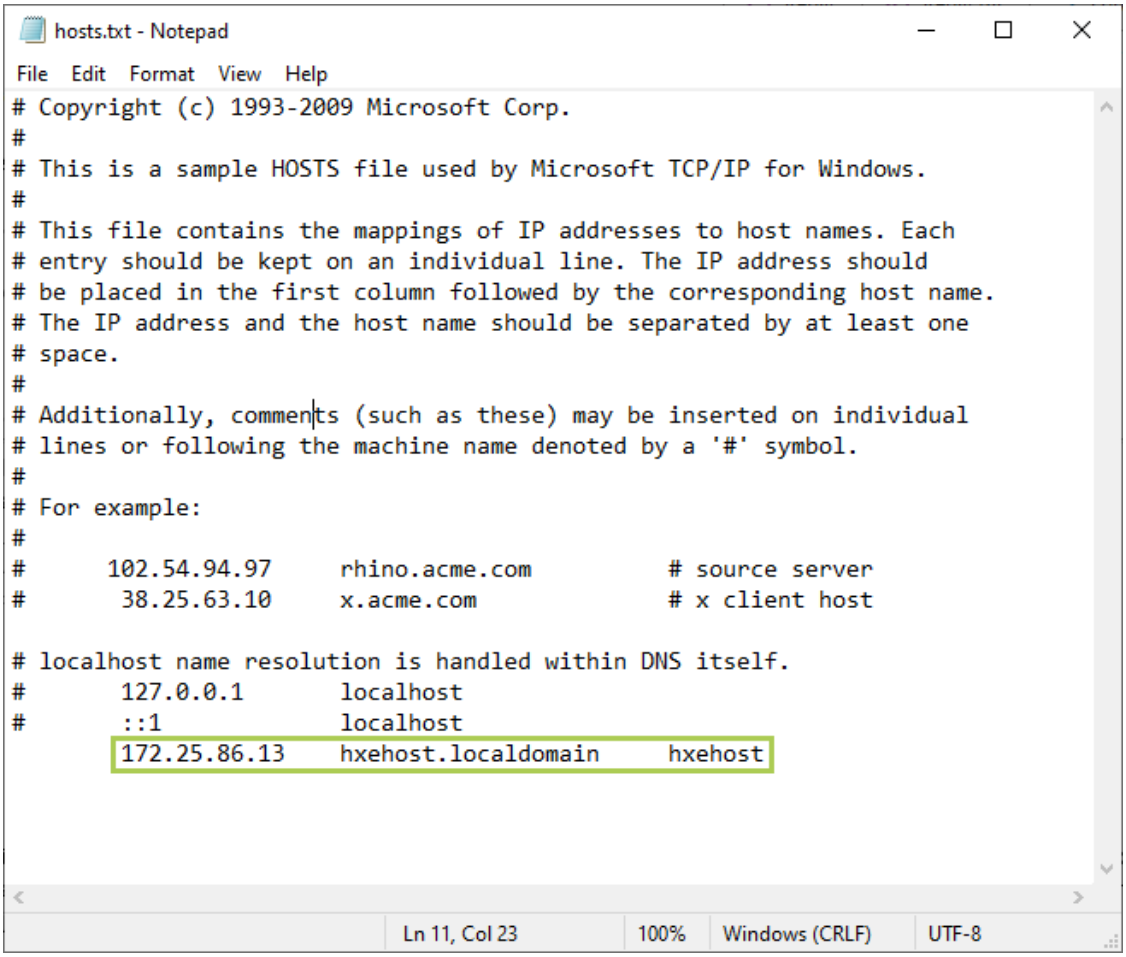
The *hxehost* IP address is private to the VM. In order for applications on your laptop (like your web browser) to access *hxehost*, add the *hxehost* IP address to your laptop's hostname map.

Procedure

1. Update etc/hosts on Windows.

   If you installed the VM installation package to a Windows machine, follow this step to update the *etc/hosts* file.

   a. On your Windows laptop, navigate to *C:\Windows\System32\drivers\etc*.
   b. In *Administrator* mode, open *hosts* in Notepad. See your operating system Help for information on opening applications in Administrator mode.
   c. In a new uncommented row, add the IP address, the fully-qualified domain name, and the hostname *hxehost*, with at least one space between each item. Save your changes.



> **i Note**
>
> If the VM is restarted and assigned a new IP, you'll need to update the Hosts file.

2. Update etc/hosts on Mac and Linux.

   If you installed the VM installation package to a Mac or Linux machine, follow this step to update the *etc/hosts* file.

   a. On your Mac or Linux machine, start the Terminal application.
   b. Enter the following command:

```
sudo sh -c 'echo <hxehost IP address> hxehost >> /etc/hosts'
```

> **i Note**
>
> If the VM is restarted and assigned a new IP, you will need to update the Hosts file.

1.2.4 Test SAP HANA, express edition

Test your XSA, SAP Web IDE, Cockpit, and XSC installations.

Context

> **i Note**
>
> Make sure you edited your */etc/hosts* file before starting this procedure.

Procedure

1. Test XSA. (Server + Applications VM only)
   a. In your VM, log in to XSA services:

      ```
      xs-admin-login
      ```

   b. When prompted for the `XSA_ADMIN` password, enter the master password.

      You specified this password when you were prompted for HANA database master password in Start SAP HANA, express edition Server [page 23].
2. (Optional) Turn on XSA messaging.

   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
   ```
3. Test SAP Web IDE. (Server + Applications VM only)
   a. Display the status and URL for the application *webide*. Enter:

      ```
      xs apps | grep webide
      ```

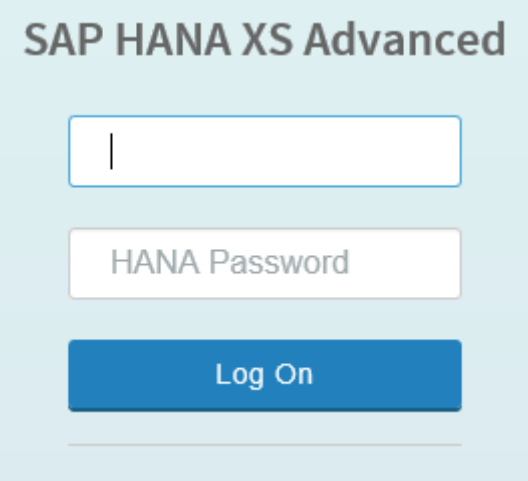
   b. Check that the application *webide* shows *STARTED* in the list of XSA applications, and has 1/1 instances. (If the output shows 0/1 in the instance column, the application is not started.)

      > **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*.

c. Test your Web IDE connection. Enter the URL for Web IDE in a browser on your laptop.

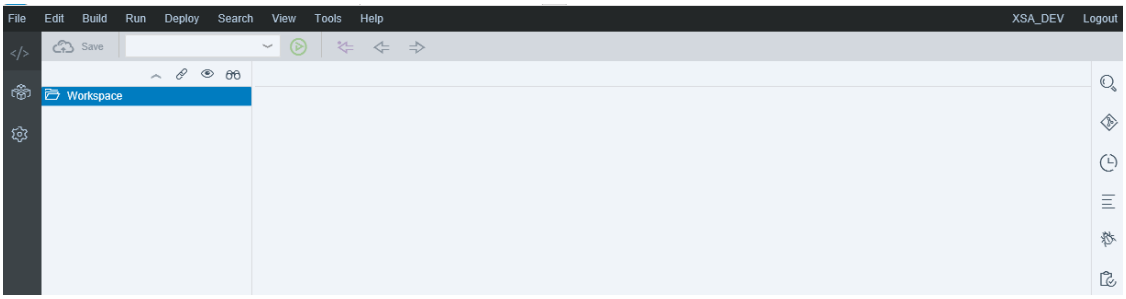
```
Example: https://hxehost:53075
```



d. For **HANA Username**, enter `XSA_DEV`.

For **HANA Password**, enter the `XSA_DEV` password you specified when you were prompted for *HANA database master password* in Start SAP HANA, express edition Server [page 23].

Web IDE displays.



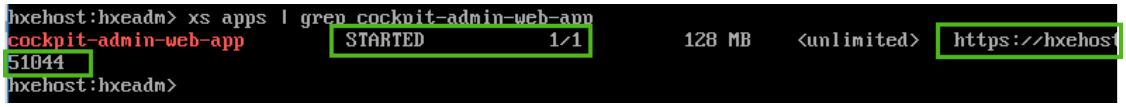
If you are prompted to change your password, follow the instructions.

4. Test Cockpit.(Server + Applications VM only)

a. Go back to your VM. Enter:

```
xs apps | grep cockpit-admin-web-app
```

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



> **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*.

c. Check that the application *xsa-cockpit* shows `STARTED` in the list of XSA applications and has 1/1 instances. Enter:

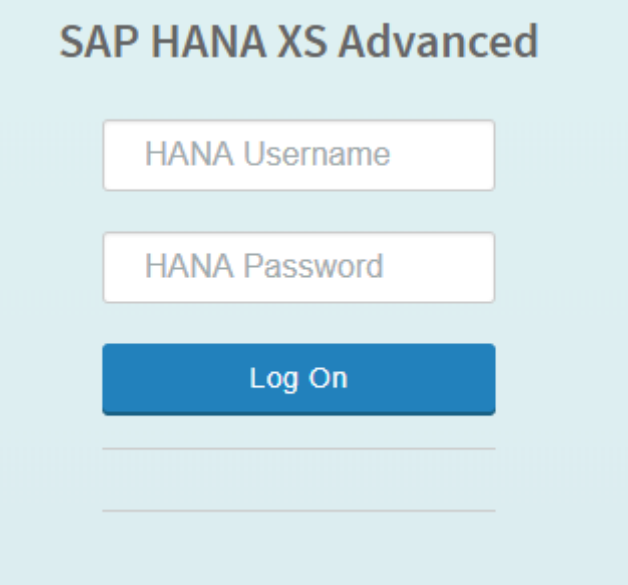
```
xs apps | grep xsa-cockpit
```

> **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.

```
hxehost:hxeadm> xs apps | grep xsa-cockpit
xsa-cockpit                STARTED          1/1          256 MB    <unlimited>   https://hxehost:
51036
hxehost:hxeadm> _
```

d. In a browser on your laptop, enter the *cockpit-admin-web-app* URL you noted in step 4. b.

The Cockpit log in page displays.

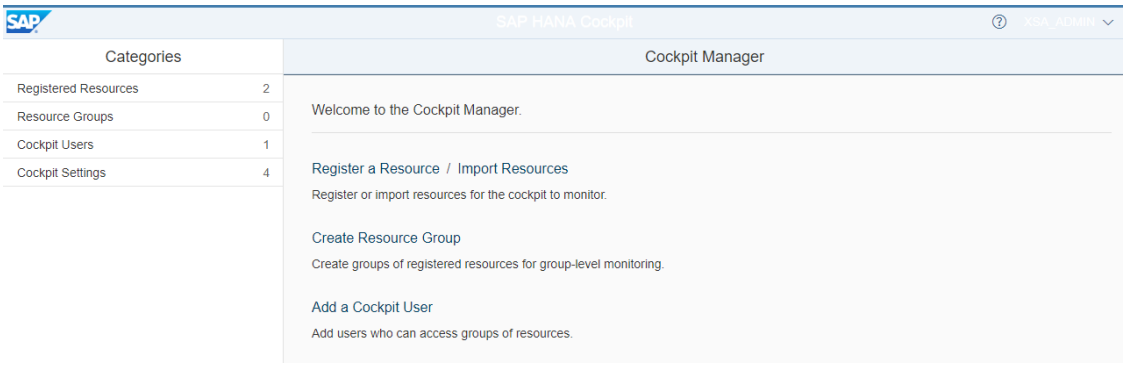


e. For **HANA Username**, enter **`XSA_ADMIN`**.

f. For **HANA Password**, enter the master password.

You specified this password when you were prompted for *HANA database master password* in *Start SAP HANA 2.0, express edition*.

Cockpit displays:



5. (Optional) Test XSC.

   Check that the XSEngine is running. From your host OS (not the VM guest) open a browser and enter:

   ```
   http://<hxehost IP address>:8090
   ```

   You recorded the IP address earlier in Start SAP HANA, express edition Server [page 23]. A success page displays. This indicates that XSC is running:

   > **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).

6. Next steps:
   - **Drivers and connectors for Python, Node.js, .NET, Java and others**: Write your first application using advanced analytics, or check sample applications using different drivers and languages: Use Clients to Query an SAP HANA Database.

- **Learn XS Advanced basics**: Explore the basics of XS Advanced tools, such as the administration cockpit or SAP Web IDE for SAP HANA. This tutorial includes a step for mapping the tenant database to the development space. See SAP HANA XS Advanced, explore the basic tools.

Related Information

Start SAP HANA, express edition Server [page 23]

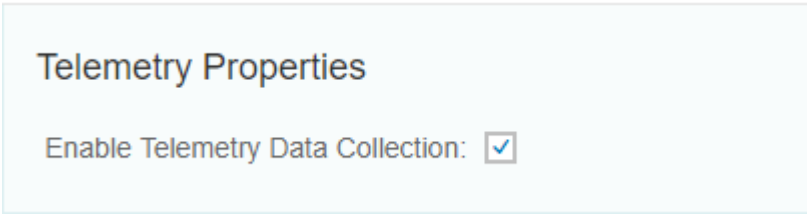
1.3 Configuring Data Collection

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

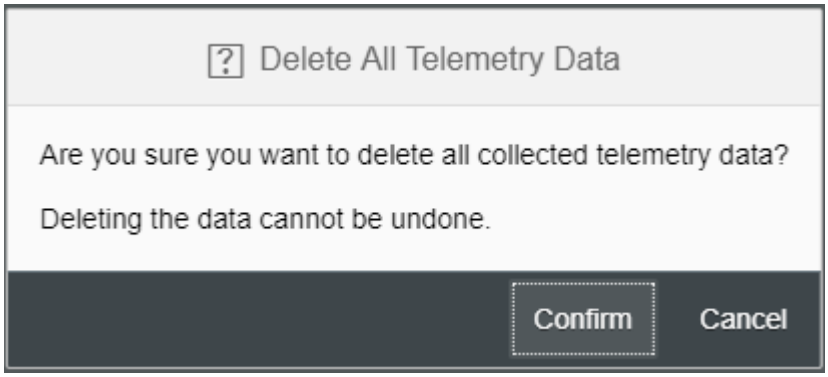
When you install SAP HANA 2.0, express edition, data collection is enabled by default. You can disable data collection after installing SAP HANA, express edition. Data collection sends anonymous performance statistics and usage statistics to SAP, so that SAP can focus development efforts on areas most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



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
> ```

1.3.1 Disable and Enable Data Collection via Command Line

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

Procedure

1. Start SAP HANA 2.0, express edition and log in as the hxeadm user.
2. To disable data collection, run:

   ```
   /usr/sap/hxe/home/bin/hxe_telemetry.sh -i 90 -u SYSTEM -p "<password>" -d
   SystemDB --disable
   ```
3. To re-enable telemetry, run:

   ```
   /usr/sap/hxe/home/bin/hxe_telemetry.sh -i 90 -u SYSTEM -p "<password>" -d
   SystemDB --enable
   ```

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

1.3.2 Check your Proxy Settings

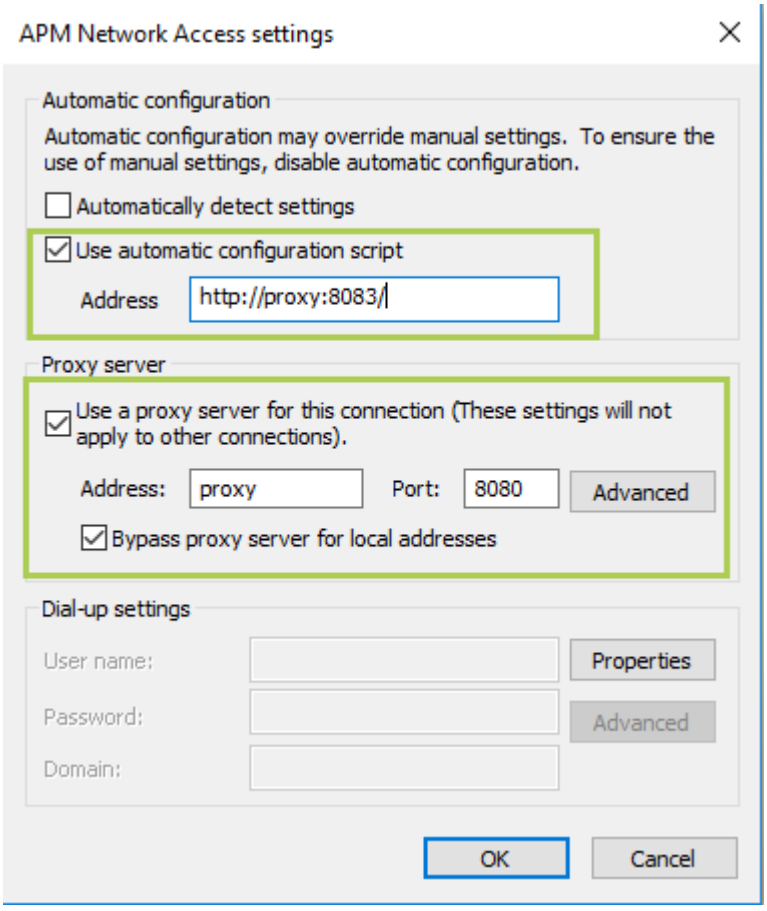
If you are inside a corporate firewall and use a proxy for connecting to *http* and *https* servers, check your proxy settings using SAP HANA Cockpit.

Procedure

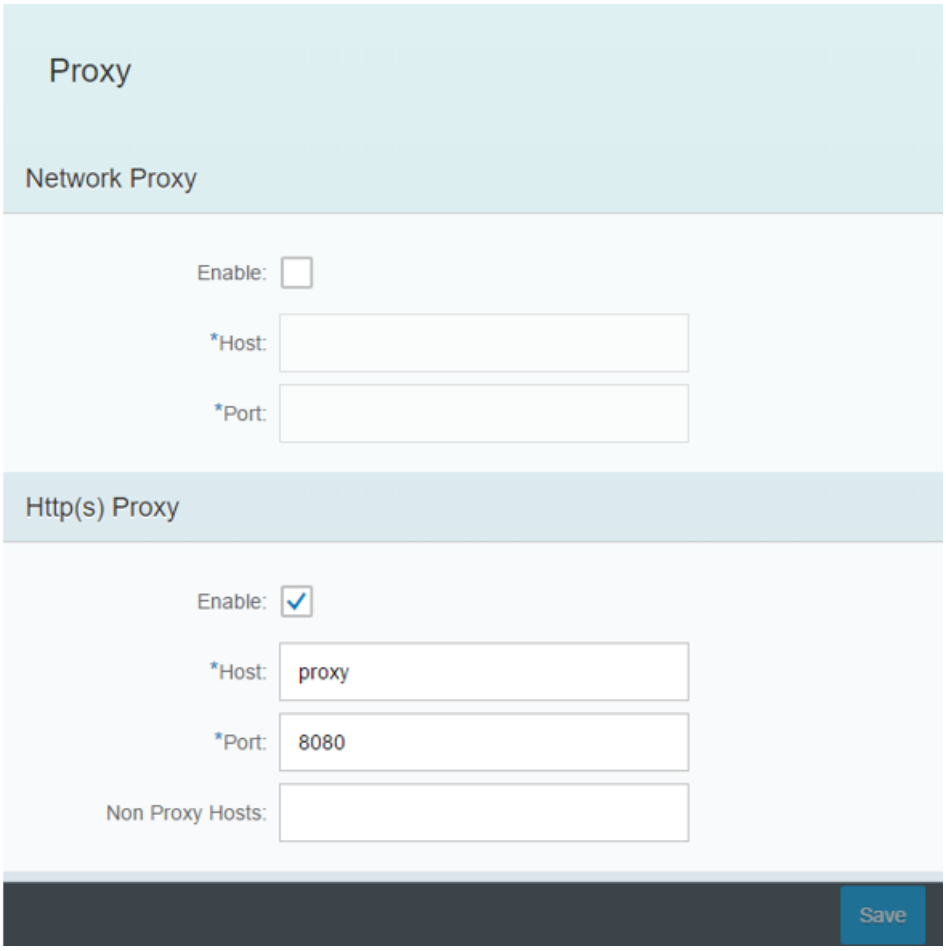
1. Obtain your proxy settings from your system administrator. You set your proxy settings earlier in this tutorial.

> **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**.

- 

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*.

1.4 Installing Optional Packages

Use the Download Manager to install optional packages.

1.4.1 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.

   In your VM, download `additional_lang.tgz` using the built-in Download Manager. From directory `/usr/sap/HXE/home/bin` enter:

   ```
   HXEDownloadManager_linux.bin linuxx86_64 vm additional_lang.tgz
   ```

2. Update folder permissions.

   In your VM, update the folder permissions on the `lang` folder.

   Navigate to `/hana/shared/HXE/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/HXE/global/hdb/custom/config/lexicon`. Enter this command:

   ```
   tar -xvzf /usr/sap/HXE/home/Downloads/additional_lang.tgz -C /hana/shared/HXE/
   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;
```

1.4.2 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. Run the memory management script.

   Run the `hxe_gc` memory management script to free up available VM memory.

   a. In your VM, log in as `hxeadm` and enter:

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

   b. Execute:

   ```
   hxe_gc.sh
   ```

   c. When prompted for System database user (SYSTEM) password, enter the New HANA database master password you specified during SAP HANA, express edition installation.

   The cleanup process runs. The command prompt returns when the cleanup process is finished.

2. Download *eml.tgz*.

   In your VM, download *eml.tgz* using the built-in Download Manager. From the same directory where you ran *hxe_gc* (`/usr/sap/HXE/home/bin`) enter:

   ```
   HXEDownloadManager_linux.bin linuxx86_64 vm eml.tgz
   ```

3. Extract *eml.tgz*.

In your VM, extract *eml.tgz*.

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

4. Run the installation script.

   As the `<hxeadm>` user, run:

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

1.4.3 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. Run the memory management script.

   Run the `hxe_gc` memory management script to free up available VM memory.

   a. In your VM, log in as `hxeadm` and enter:

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

   b. Execute:

      ```
      hxe_gc.sh
      ```

   c. When prompted for System database user (SYSTEM) password, enter the New HANA database master password you specified during SAP HANA, express edition installation.

      The cleanup process runs. The command prompt returns when the cleanup process is finished.

2. Download `apl.tgz`.

   In your VM, download *apl.tgz* using the built-in Download Manager. From the same directory where you ran *hxe_gc* (`/usr/sap/HXE/home/bin`) enter:

   ```
   HXEDownloadManager_linux.bin linuxx86_64 vm apl.tgz
   ```

3. Extract `apl.tgz`.

   In your VM, extract `apl.tgz`.

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

4. Run the installation script.

   As the `hxeadm` user, run the installation script as root:

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

1.4.4 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*.

1.4.4.1 Installing SAP HANA HDB Client (Windows)

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.

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`

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.

   Install the Download Manager to your client machine and download the client package.

   1. Save the Download Manager installation files to your client machine and open it. For instructions on downloading and running the Download Manager, see either the Installing SAP HANA 2.0, express edition (Binary Installer Method) or Installing SAP HANA 2.0, express edition (Virtual Machine Method) tutorials, or go straight to the SAP HANA, express edition registration page.
   2. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.
   3. Click *Browse* and select a directory where your client package will be saved.
   4. Select the *Clients (Windows)* package. Clear the Select boxes of all other packages.
   5. Click *Download*. The file `clients_windows.zip` downloads to your save directory.
   6. 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 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.

1.4.4.2 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.

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.

   Install the Download Manager to your client machine and download the client package.

   1. Save the Download Manager installation files to your client machine and open it. For instructions on downloading and running the Download Manager, see either the Installing SAP HANA 2.0, express edition (Binary Installer Method) or Installing SAP HANA 2.0, express edition (Virtual Machine Method) tutorials, or go straight to the SAP HANA, express edition registration page.
   2. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.
   3. Click *Browse* and select a directory where your client package will be saved.
   4. Select the *Clients (Mac)* package. Clear the Select boxes of all other packages.
   5. Click *Download*. The `clients_mac.tgz` file downloads to your save directory.
   6. 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 and run `hdbinst` to start the installer:

      ```
      cd HDB_CLIENT_MACOS
      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 `%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.

1.4.4.3 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.

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`

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.

   Install the Download Manager to your client machine and download the client package.

   1. Save the Download Manager installation files to your client machine and open it. For instructions on downloading and running the Download Manager, see either the Installing SAP HANA 2.0, express

edition (Binary Installer Method) or Installing SAP HANA 2.0, express edition (Virtual Machine Method) tutorials, or go straight to the SAP HANA, express edition registration page.

2. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.
3. Click *Browse* and select a directory where your client package will be saved.
4. Select the *Clients (Linux X86/64)* package. Clear the Select boxes of all other packages.
5. Click *Download*. The `clients_linux_x86_64.tgz` file downloads to your save directory.
6. 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.

1.4.4.4 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.

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.

   Install the Download Manager to your client machine and download the client package.

   1. Save the Download Manager installation files to your client machine and open it. For instructions on downloading and running the Download Manager, see either the Installing SAP HANA 2.0, express edition (Binary Installer Method) or Installing SAP HANA 2.0, express edition (Virtual Machine Method) tutorials, or go straight to the SAP HANA, express edition registration page.
   2. In Download Manager, in the *Image* menu, select either *Virtual Machine* or *Binary Installer*.
   3. Click *Browse* and select a directory where your client package will be saved.
   4. Select the *Clients (Linux PPC/Little Endian)* package. Clear the Select boxes of all other packages.
   5. Click *Download*. The `clients_linux_ppc64le.tgz` file downloads to your save directory.

6. 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.

1.4.4.5 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.

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.

Procedure

1. XS CLI client info.

   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.
2. Download the client package.

   Install the Download Manager to your client machine and download the client package.

   1. Save the Download Manager installation files to your client machine and open it. For instructions on downloading and running the Download Manager, see either the Installing SAP HANA 2.0, express edition (Binary Installer Method) or Installing SAP HANA 2.0, express edition (Virtual Machine Method) tutorials, or go straight to the SAP HANA, express edition registration page.
   2. In Download Manager, in the *Image* pull-down, select either *Virtual Machine* or *Binary Installer*.
   3. Click *Browse* and select a directory where your client package will be saved.
   4. Select the *Clients* package that matches the machine you will be installing the clients on. Clear the Select boxes of all other packages.
   5. Click *Download*. The `hdb_client_<OS>.tgz` file, or `clients_windows.zip` for Windows, downloads to your save directory.
   6. 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`

3. 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>
   ```

4. 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`
5. 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 exists before you can connect from within the API command.

6. 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.

7. 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
   ```

   > **i 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.

8. 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>"
```

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

9. 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
   ```

1.4.5 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. Run the memory management script.

   Run the `hxe_gc` memory management script to free up available VM memory

   a. In your VM, log in as `hxeadm` and enter:

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

b. Execute:

```
hxe_gc.sh
```

c. When prompted for System database user (SYSTEM) password, enter the New HANA database master password you specified during SAP HANA, express edition installation.

The cleanup process runs. The command prompt returns when the cleanup process is finished.

2. Download sdi.tgz.

In your VM, download *sdi.tgz* using the built-in Download Manager. From the same directory where you ran *hxe_gc* (`/usr/sap/HXE/home/bin`) enter:

```
HXEDownloadManager_linux.bin linuxx86_64 vm sdi.tgz
```

3. Extract sdi.tgz.

In your VM, extract *sdi.tgz*:

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

4. Run the installation script.

As the `hxeadm` user, run:

```
HANA_EXPRESS_20/install_sdi.sh
```

5. 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

1.4.5.1 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. Run the memory management script.

   Run the `hxe_gc` memory management script to free up available VM memory

   a. In your VM, log in as `hxeadm` and enter:

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

   b. Execute:

   ```
   hxe_gc.sh
   ```

   c. When prompted for System database user (SYSTEM) password, enter the New HANA database master password you specified during SAP HANA, express edition installation.

   The cleanup process runs. The command prompt returns when the cleanup process is finished.

2. Download dpagent_linux_x86_64.tgz.

   In your VM, download *dpagent_linux_x86_64.tgz* using the built-in Download Manager. From the same directory where you ran *hxe_gc* (`/usr/sap/HXE/home/bin`) enter:

   ```
   HXEDownloadManager_linux.bin linuxx86_64 vm dpagent_linux_x86_64.tgz
   ```

3. Extract dpagent_linux_x86_64.tgz.

   In your VM, extract *dpagent_linux_x86_64.tgz*:

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

4. Install the Data Provisioning Agent.

   In your VM, enter the following command:

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

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

5. 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/HXE/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**: *hxehost*
- **Port Number**: 39015
- **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.

6. 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

1.5 Advanced Configuration

Optional advanced configuration procedures.

1.5.1 Adjust the Global Allocation Limit

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

Context

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.

Procedure

1. Connect to HANA Studio.

   Connect to the HANA studio with systemdb credentials.
2. Click the **Configuration** tab.

   In the administration editor of HANA Studio, choose the **Configuration** tab. A list of all configuration files appears.
3. Expand `global.ini`.

   Expand the `global.ini` configuration file.
4. Adjust `global_allocation_limit`.

   In the `global.ini` configuration file change the value of the `global_allocation_limit` in the *memorymanager* section.

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

   > **i** Note
   >
   > If you're using SAP HANA, express edition for configuring multiple replayers, please be aware that you will need to modify the global allocation limit of each SAP HANA, express edition installation to provide sufficient memory for the replayer process. In order to estimate the required memory, please use the formula cited in the SAP HANA Capture and Replay Guide - Best Practices for Setting Up, Capturing, Replaying, and Analyzing.
   >
   > You can modify the global allocation limit in the `ini` file of each installation. Please note that the use of replayers does not require the SAP HANA, express edition installation to be up and running, but is still affected by the global allocation limit defined for the installed system. Please note that when changing the global allocation limit of SAP HANA, express edition installations, the database itself can exceed the maximum memory allowed free of charge. This can result in a lockdown of the database itself by the license manager, which will not impact the replayer process, but will render the database unusable until the next restart.
   >
   > For more information on the scenario setup, please refer to this blog.

1.5.1.1 Virtual Machine: Checking Resource Usage

Issue: You are having memory issues on your VM and want to check resource usage.

Solution: If you have HANA studio, right-click on the system and select **Configuration and Monitoring** > **Open Administration** and check the Overview and Landscape tabs for anything in red.

If you don't have HANA studio, run the following queries in `hdbsql` to view SAP HANA resource usage:

```
select service_name, round(effective_allocation_limit/1024/1024/1024, 1) as
MemLimit,
round(total_memory_used_size/1024/1024/1024,1) as MemUsed from m_service_memory;
```

If the `MemUsed` is close to the `MemLimit`, you may encounter problems allocating memory.

Alternatively, you can run the Linux `free` command at the command line to see free resources:

```
free -g
```

The key number is in the second row (-/+ buffers/cache) in the *free* column. If this number is low (e.g. 0 GB), you may have run out of memory when performing your recent operation.

You can also run the following command to see if you are running out of disk space on the VM's file system:

```
df -h
```

Look for the *Use%* for the `/dev/sda1` file system. If it is down to just a few GB, you may have run out of disk space when performing your recent operation.

1.5.2 Run the JSON Document Store in Embedded Mode

If you want to use the JSON Document Store, configure the JSON Document Store to run in embedded mode to conserve memory resources.

Context

The SAP HANA Document Store is a store for JSON artifacts and allows native operations on JSON including filtering, aggregation, and joining JSON documents with HANA column or row store tables.

JSON documents (JavaScript Object Notation) are stored in so-called collections. The content of a JSON document may be deeply structured but unlike XML it does not have a schema. This means that any valid JSON data may be inserted without first declaring its structure. Collections appear to users like tables and users can work with them in SQL in a similar fashion. For example, data can be inserted with the regular INSERT statement and read via SELECT. You can read data from tables and collections in a single statement and you can combine tables and collections by joining as with any other column or row store table.

You can find an overview of the JSON Document Store in the SAP HANA Administration Guide. Full technical details of the Document Store are given in the SAP HANA Developer Guide for XS Advanced. Details of Document Store-specific SQL statements are given in the SAP HANA SQL Reference and System Views Guide.

Procedure

1. Open the `docstore.ini` file.

   Locate the **embedded** configuration parameter in the general section.
2. Set the **embedded** configuration parameter to TRUE.

   The default value is FALSE, which sets a standalone Document Store server. Specify TRUE to run the Document Store embedded in the server.

> **i Note**
>
> Existing Document Store users who wish to run the Document Store in embedded mode must first drop all existing collections, set the mode and then start the master index server again which will then feature the JSON Document Store.

2 Best Practices

2.1 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.

2.2 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 *hxeadm* user:

```
sudo su -l hxeadm
```

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

```
/usr/sap/HXE/HDB90/exe/hdbsql -i 90 -d SystemDB -u SYSTEM -p "<SYSTEM-
password>" "CREATE USER <admin-username> PASSWORD <admin-password> NO
FORCE_FIRST_PASSWORD_CHANGE;"
/usr/sap/HXE/HDB90/exe/hdbsql -i 90 -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/HXE/HDB90/exe/hdbsql -i 90 -d SystemDB -u <admin-username> -p
"<admin-password>" "ALTER USER SYSTEM DEACTIVATE USER NOW;"
```

3 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.

Context

> **i Note**
>
> Upgrading is supported only for SAP HANA, express edition 2.0 (SP 00 onward). Upgrading from SAP HANA, express edition 1.0 SP 12 is not supported.

> **i Note**
>
> If you haven't started the tenant database, or reset the tenant database `system` password since installation, you need to do so before the upgrade.
>
> - Login to SystemDB database and run:
>
>   ```
>   ALTER SYSTEM START DATABASE HXE
>   ```
>
> Login to HXE tenant database with `system` user and change the password.

Procedure

1. Log in as hxeadm.
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 VM's built-in update utility found in the `~/home/bin` directory. Depending on your VM, use either `HXECheckUpdate_linux.bin` for Linux x86-64, and `HXECheckUpdate.jar` for Linux PPC64. Follow the prompts to download the new files. By default, they will be downloaded to

`~/usr/sap/HXE/home/Downloads`. The downloaded files will be `hxe.tgz`, `hxexsa.tgz`, and all the 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`, `hxexsa.tgz`, and all the optional components you want to install.

For Download Manager (console mode) command line syntax, see (Optional) Download Using the Download Manager (Console Mode) [page 13].

3. Extract all of the downloaded packages to the same 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 server update.

> **i Note**
>
> `hxe_upgrade.sh` detects the server and applications packages. The script will upgrade the server the optional components.

4 Uninstalling SAP HANA, express edition

To uninstall SAP HANA, express edition, simply remove the virtual machine from your hypervisor.

5 Troubleshooting

5.1 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.

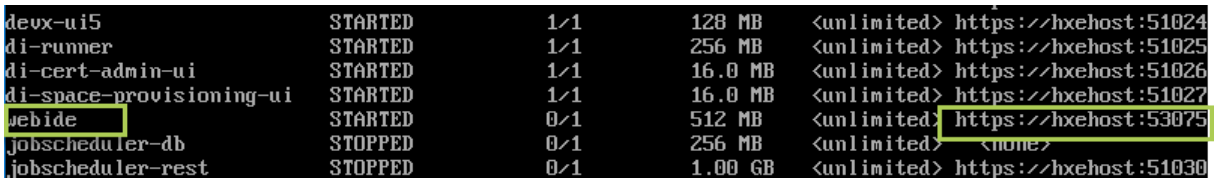
Solution: Log in to your SAP HANA 2.0, express edition as `<sid>`adm:

```
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:



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`.

5.2 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[yymmdd].log`
- Windows: `%TEMP%\hxedm_[yymmdd].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.

5.3 Unable to Obtain an IPv4 Address in `VMWare`

Issue: You are unable to obtain an IPv4 `hxehost` IP address. You are using a `VMWare` hypervisor.

`VMWare` defaults to bridged networking. You may need to adjust `VMWare`'s network adapter settings in certain circumstances.

If you are behind a proxy or a firewall, your institution's network may prevent `VMWare` from assigning an IPv4 address when you attempt to locate your `hxehost` IP address.

Solution:

1. In VMWare, change your network adapter settings from Bridged to NAT.
2. Wait a few minutes.
3. At the command prompt, enter **`sudo ifconfig`** to see if an IPv4 address is now assigned. You do not need to restart your VM.

5.4 Error Indicates Package is not Compatible with Installed SAP HANA, Express Edition Version

Issue: You downloaded an optional component package using the Download Manager, but an error occurs when you try to install it.

Context

The error message reads something similar to:

```
Cannot install <component>. This <component> version is not compatible with your
installed HANA, express edition version.
```

If you see this message, the optional component is newer than your server, and is not compatible.

Procedure

1. Login as **<sid>adm** (**hxeadm** for prepackaged VM users).
2. Run `~/bin/HXEDownloadManager_linux.bin` to download the compatible version. See Updating SAP HANA, express edition [page 60].

   > **i Note**
   >
   > Note that as of SAP HANA 2.0, express edition Revision 022, the Download Manager will download packages only if they are at the same version as your server. This is convenient in situations where you haven't upgraded for a while. It eliminates the risk of downloading a package that is too recent for your server.

3. Read the release notes for additional information.

5.5 Upgrade Script Hangs While Upgrading VM Installation

Issue: When you run `hxe_upgrade.sh`, you notice the upgrade hangs.

Context

Solution: The VM is low on memory. Run the `hxe_gc` memory management script.

Procedure

1. Open a new terminal to your VM.
2. Run the memory management script.

   The `hxe_gc` memory management script frees up available VM memory.

   - In your VM, log in as `hxeadm` and enter:

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

   - Execute:

     ```
     hxe_gc.sh
     ```

   - When prompted for `System database user (SYSTEM) password`, enter the `New HANA database master password` you specified during SAP HANA, express edition installation.

   The cleanup process runs. The command prompt returns when the cleanup process is finished.

5.6 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 hxeadm user, log in to XSA services:

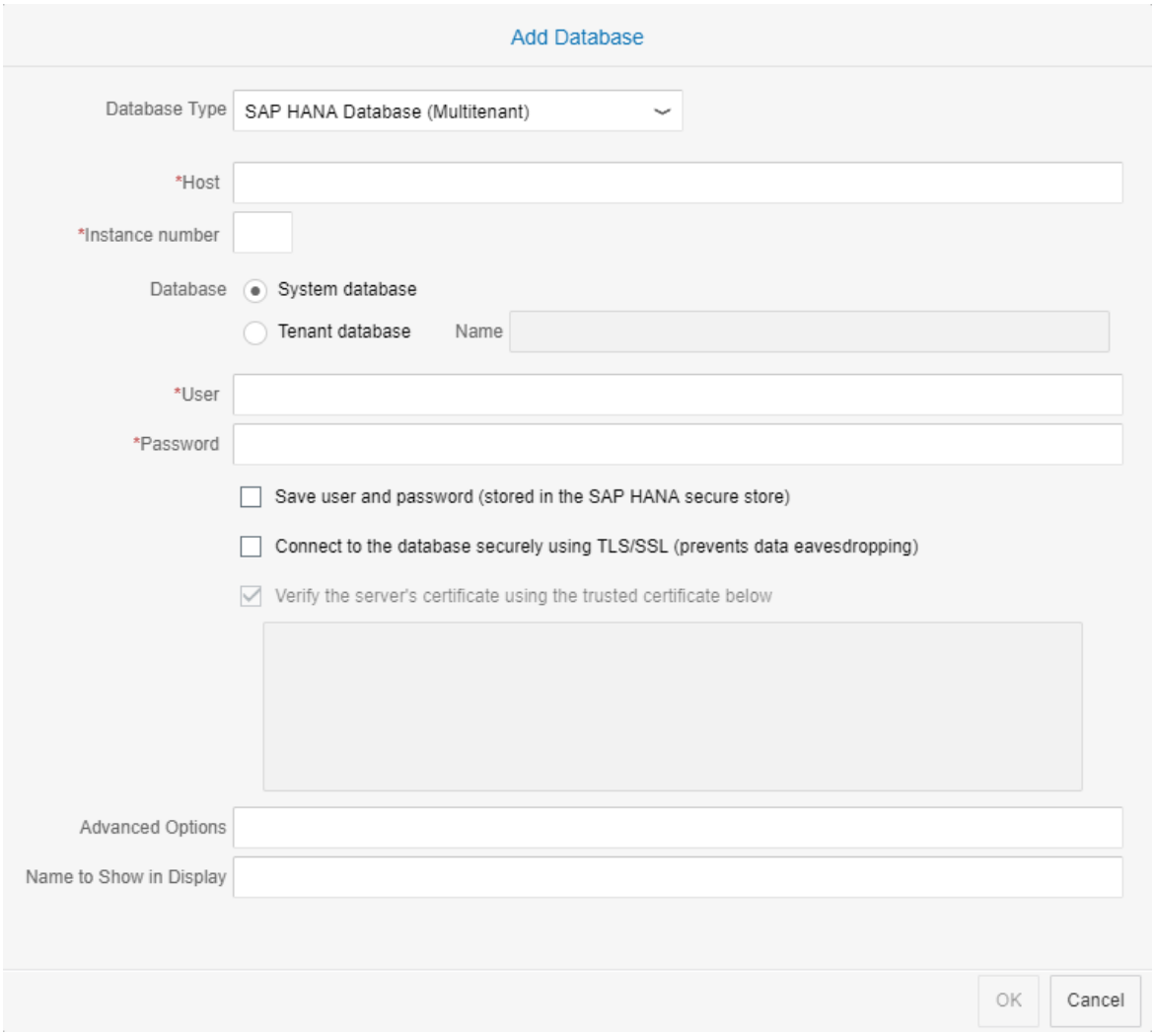
   ```
   xs-admin-login
   ```

   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.



5.7 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.

In your VM, as the hxeadm user, enter:

```
HDB stop
```

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