

Getting Started with SAP Data Hub, trial edition

Table of Contents

| | | |
|----------|--|-----------|
| 1 | Solution Information..... | 3 |
| 1.1 | Product Overview..... | 3 |
| 1.2 | Architecture Overview | 3 |
| 1.3 | Installed Products | 4 |
| 2 | Provisioning the Solution | 5 |
| 2.1 | Prerequisite: Cloud Provider Account..... | 5 |
| 2.2 | Accessing the SAP Cloud Appliance Library..... | 5 |
| 2.3 | Creating a Solution Instance | 6 |
| 3 | Accessing the Solution..... | 9 |
| 3.1 | Overview | 9 |
| 3.2 | Mapping your local hosts file | 10 |
| 3.3 | Accessing the SAP Data Hub Application | 11 |
| 3.3.1 | Accessing the Application UI | 11 |
| 3.3.2 | Accessing the XS Advanced Administration tool..... | 12 |
| 3.3.3 | Accessing the SAP HANA database..... | 13 |
| 3.3.4 | Accessing the Operating System | 14 |
| 3.4 | Accessing the SAP Data Hub Distributed Runtime | 14 |
| 3.4.1 | Accessing the Distributed Runtime UIs | 14 |
| 3.4.2 | Accessing the Kubernetes Cluster | 16 |
| 3.4.3 | Accessing SAP Vora Diagnostics UIs..... | 16 |
| 3.5 | Accessing the Jump Box | 17 |
| 4 | Connecting to Google Cloud Storage | 18 |
| 5 | Licenses | 20 |
| 5.1 | Running Solution as a Trial for a Free Period..... | 20 |
| 5.2 | Running Solution with a Product License Key | 20 |
| 6 | Security Aspects..... | 21 |
| 7 | Troubleshooting..... | 23 |
| 8 | Appendix..... | 24 |

1 Solution Information

1.1 Product Overview

The SAP Data Hub, trial edition is a pre-configured appliance for evaluating and testing SAP Data Hub.

SAP Data Hub includes data sharing, pipelining and orchestration capabilities that help companies accelerate and expand data flow across a diverse data landscape:

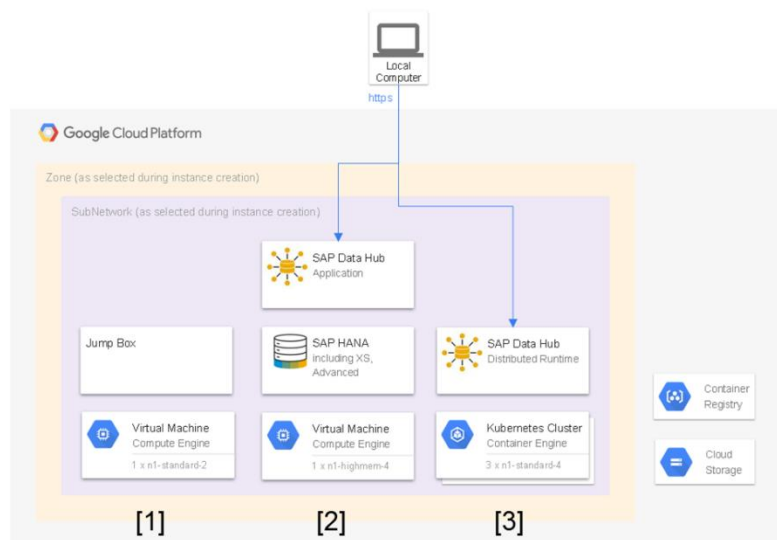
- Data Pipelines are data-driven applications consisting of reusable and configurable operators.
- Task Workflows orchestrate processes across a data landscape.
- And Data Governance allows you to extract metadata from connected data stores. It supports discovery, data quality/integration, profiling and search.

To learn more about SAP Data Hub, refer to:

- Product Home Page: <https://www.sap.com/products/data-hub.html>
- SAP Help Portal: https://help.sap.com/viewer/p/SAP_DATA_HUB
- Tutorials: <https://www.sap.com/developer/topics/data-hub.html>
- Frequently Asked Questions: <https://blogs.saphana.com/2017/10/04/what-is-sap-data-hub-and-answers-to-other-frequently-asked-questions/>

1.2 Architecture Overview

While creating a solution instance of SAP Data Hub, trial edition, the SAP Cloud Appliance library creates:



- a virtual machine to orchestrate the solution instance creation (Jump Box) [1]
- a virtual machine to run the SAP Data Hub Application [2]
- a Kubernetes cluster to run the SAP Data Hub Distributed Runtime [3]

The Jump Box [1] is a small virtual machine (2 cores, 7.50 GB RAM). It is used during the creation of the solution instance to run the installer for the SAP Data Hub Distributed Runtime. As a user of the SAP Data Hub, trial edition you typically do not have to access the Jump Box except for troubleshooting (in rare cases).

The SAP Data Hub Application [2] is built on top of SAP HANA and SAP HANA Extended Application Services, advanced model. It is a rather lightweight application that serves as the central entry point for end-users of SAP Data Hub. It provides you with a single point of access to a range of tools. As part of this pre-configured appliance the SAP Data Hub Application runs on a virtual machine with 4 cores and 26GB memory.

The SAP Data Hub Distributed Runtime [3] leverages container technology, in particular Docker and Kubernetes. It allows to query large amounts of data (in distributed storages like Amazon S3, Azure Data Lake (ADL), Azure Storage Blobs (WASB), HDFS, Google Cloud Storage) and to run highly scalable data flows and data-driven applications. As part of this pre-configured appliance the SAP Data Hub Distributed Runtime uses a Kubernetes cluster with three worker nodes (each 4 cores, 15 GB RAM).

1.3 Installed Products

The SAP Data Hub, trial edition consists of:

- SAP Data Hub 1.0 SPS 03
 - SAP Data Hub Application
 - SAP Data Hub Distributed Runtime
- SAP HANA, express edition 2.0

2 Provisioning the Solution

2.1 Prerequisite: Cloud Provider Account

To use the SAP Cloud Appliance Library to create a solution instance of SAP Data Hub, trial edition, you need to have access to a Google Cloud Platform project through a service account.

You can grant roles to a service account to ensure that it has permission to complete specific actions on the resources of the Google Cloud Platform project. Please ensure that the service account you use has the following roles.

| Name | Description |
|-----------------------------|---|
| Compute Instance Admin (v1) | Full control of Compute Engine instances, instance groups, disks, snapshots, and images. Read access to all Compute Engine networking resources. |
| Compute Network Admin | Full control of Compute Engine networking resources. |
| Compute Security Admin | Full control of Compute Engine security resources. |
| Kubernetes Engine Admin | Full management of Kubernetes Clusters and their Kubernetes API objects. |
| Service Account User | Create VMs and other GCP tasks with a service account. Users cannot impersonate the account directly as they can with Service Account Actor role. |
| Storage Admin | Full control of GCS resources. |

For more information about how to link the SAP Cloud Appliance Library with a Google Cloud Platform project, refer to the [FAQ page](#).

2.2 Accessing the SAP Cloud Appliance Library

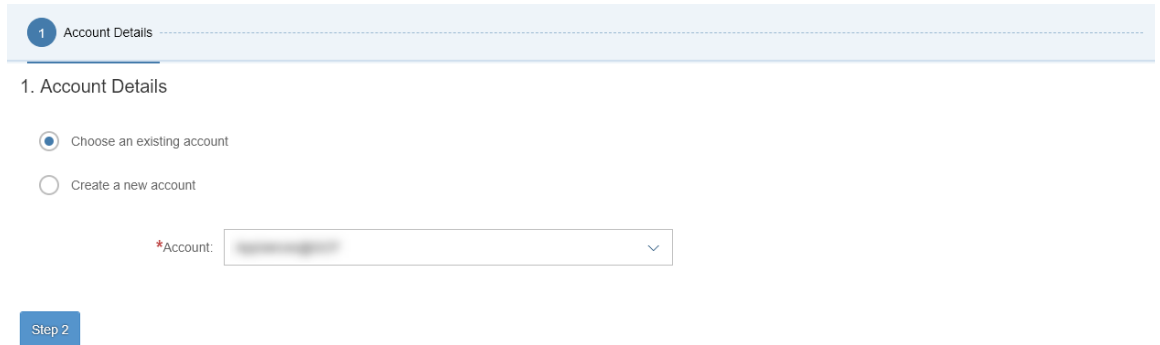
Open the SAP Cloud Appliance Library in your web browser using the following link: <https://cal.sap.com>.

If you are a first-time user of SAP Cloud Appliance Library, familiarize yourself with its basic concepts and how to work with the user interface by reading the [documentation](#).

2.3 Creating a Solution Instance

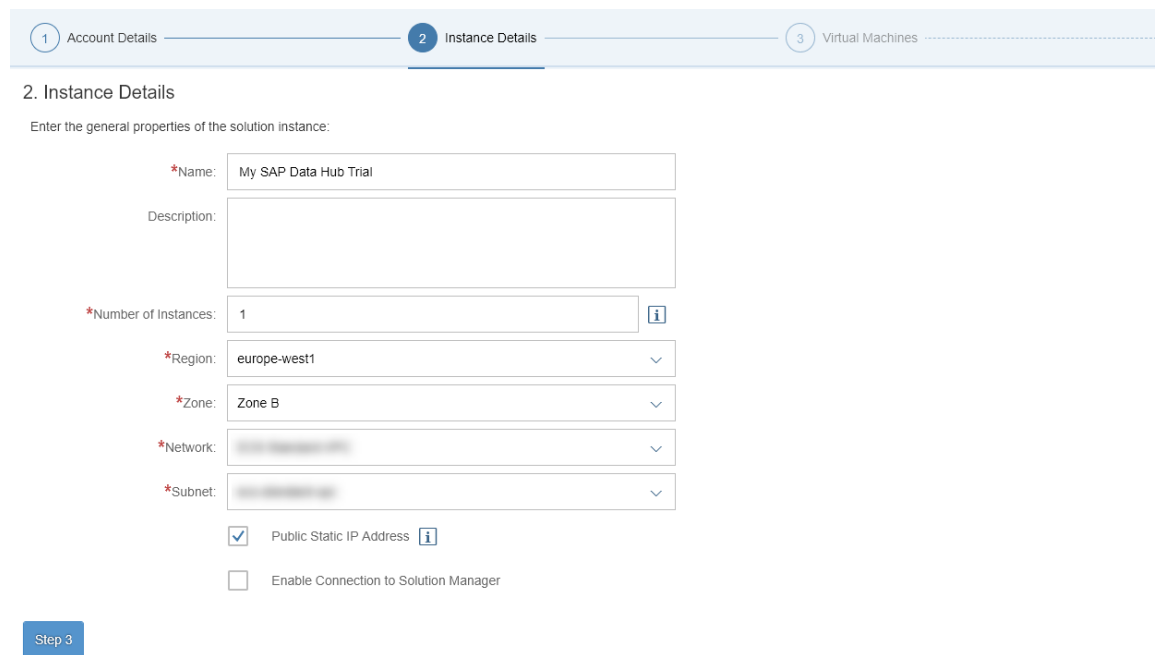
The following steps guide you through the creation of a solution instance of SAP Data Hub 1.0 SPS 03, trial edition. Wherever you need more information, refer to the [documentation](#).

1. Navigate to solution SAP Data Hub 1.0 SPS 03, trial edition.
2. Press the Create Instance button and switch to Advanced Mode (pressing the button in the lower right of the screen).
3. Select the cloud provider account.



The screenshot shows the '1. Account Details' step of the creation process. At the top, a progress bar highlights '1 Account Details'. Below the heading, there are two radio buttons: 'Choose an existing account' (selected) and 'Create a new account'. A dropdown menu labeled '*Account:' is shown with a blurred selection. A blue button labeled 'Step 2' is at the bottom.

4. Enter Name, Number of Instances (1), Region, Zone, Network and Subnet. Ensure that the checkbox Public Static IP Address is marked.



The screenshot shows the '2. Instance Details' step. The progress bar now highlights '2 Instance Details'. The heading is '2. Instance Details' with the instruction 'Enter the general properties of the solution instance:'. The form includes: a text field for '*Name:' with 'My SAP Data Hub Trial'; a text area for 'Description:'; a dropdown for '*Number of Instances:' set to '1'; a dropdown for '*Region:' set to 'europe-west1'; a dropdown for '*Zone:' set to 'Zone B'; a dropdown for '*Network:'; a dropdown for '*Subnet:'. At the bottom, there are two checkboxes: 'Public Static IP Address' (checked) and 'Enable Connection to Solution Manager' (unchecked). A blue button labeled 'Step 3' is at the bottom.

5. Next check the parameters of the Jump Box and the SAP Data Hub Application: Confirm the size of the virtual machines, the expandable storage and the access points. Normally you do not have to change anything.

1 Account Details

2 Instance Details

3 Virtual Machines

3. Virtual Machines

Select size and access points of the virtual machines:

Sizes

| Virtual Machine | Size |
|--------------------------|---|
| Jump Box | n1-standard-2 (2 cores, 7.50GB memory, SSD) |
| SAP Data Hub Application | n1-highmem-4 (4 cores, 26GB memory, SSD) |

Expandable Storage

| Volume | Default Size | Additional Size | Total |
|--------------------------|--------------|-----------------|-------|
| Jump Box | | | |
| OS Volume | 60 GB | 0 GB | 60 GB |
| Vora Content | 10 GB | 0 GB | 10 GB |
| agent-vora | 10 GB | 0 GB | 10 GB |
| SAP Data Hub Application | | | |
| OS Volume | 10 GB | 0 GB | 10 GB |

6. Next check the parameters of the SAP Data Hub Distributed Runtime: Confirm the number of nodes, their size and the access points. Normally you do not have to change anything.

1 Account Details

2 Instance Details

3 Virtual Machines

4 Kubernetes Cluster

4. Kubernetes Cluster

*Number of Nodes: 3

*Size: n1-standard-4 (4 cores, 15GB memory, HDD)

Access Points

| Service | Port Range | IP Range | Type | Enabled |
|---------|------------|----------|---------|-------------------------------------|
| TCP | 443 | 0.0.0.0 | Default | <input checked="" type="checkbox"/> |

Step 5

7. Next define a solution password. We will refer to this as <Master Password> for the rest of this document.
8. Finally set up the schedule of the solution instance. You can define a schedule to suspend it. And you can

1 Account Details

2 Instance Details

3 Virtual Machines

4 Kubernetes Cluster

5 Solution Password

5. Solution Password

Set the master password for the solution instance. You can check the Getting Started Guide to learn where to use this password.

*Password:

*Retype Password:

i

The valid characters are: A-Z, a-z, 0-9, \$, #, _
The first character has to be one of the following: A-Z, a-z, \$, #
The first 3 characters cannot be one and the same
The password must contain at least 1 lowercase letter(s)
The password must contain at least 1 uppercase letter(s)
The password must contain at least 1 digit(s)
The password must be between 8 and 9 characters long

Step 6

set a termination date.

1 Account Details

2 Instance Details

3 Virtual Machines

4 Kubernetes Cluster

5 Solution Password

6 Schedule Details

6. Schedule Details

Set up the schedule of the solution instance, when to suspend it, and when to terminate it.

Time Zone:

Scheduling Options

☐ Activate and suspend by schedule

☐ Suspend on an exact date

☒ Manually Activate and Suspend

Termination Date

☐ Set the termination date of the solution instance

Review

9. Press the Review button. Then (assuming you are happy with all parameters) press the Create button. It will now take around 30 minutes to create the solution instance.

You can store and/or download the private key. This is needed in case you want to access the SAP Data Hub Application or the Jump Box on operating system level (typically only needed for troubleshooting).

3 Accessing the Solution

3.1 Overview

As already described in chapter 1.2 Architecture Overview, a solution instance of SAP Data Hub, trial edition consists of:

- a virtual machine to orchestrate the solution instance creation (Jump Box)
- a virtual machine to run the SAP Data Hub Application
- a Kubernetes cluster to run the SAP Data Hub Distributed Runtime

Subsequently you learn how to access your solution instance. A precondition is that you map certain IP addresses against hostnames. This is described in chapter 3.2 Mapping your local hosts file.

Afterwards you can proceed to access the different parts of the solution instance as described in:

- Chapter 3.3 Accessing the SAP Data Hub Application
- Chapter 3.4 Accessing the SAP Data Hub Distributed Runtime

For troubleshooting you might also want to access the Jump Box. You find a description for this in chapter 3.5 Accessing the Jump Box.

Remark: This chapter is not a step-by-step description how to work with SAP Data Hub (for this you can refer to the links provided at the beginning of this document). It is rather intended as reference. As end-user, you can navigate to all relevant tools / user interfaces directly from the SAP Data Hub Cockpit. This is described in chapter 3.3.1 Accessing the Application UI. Make use of this possibility.

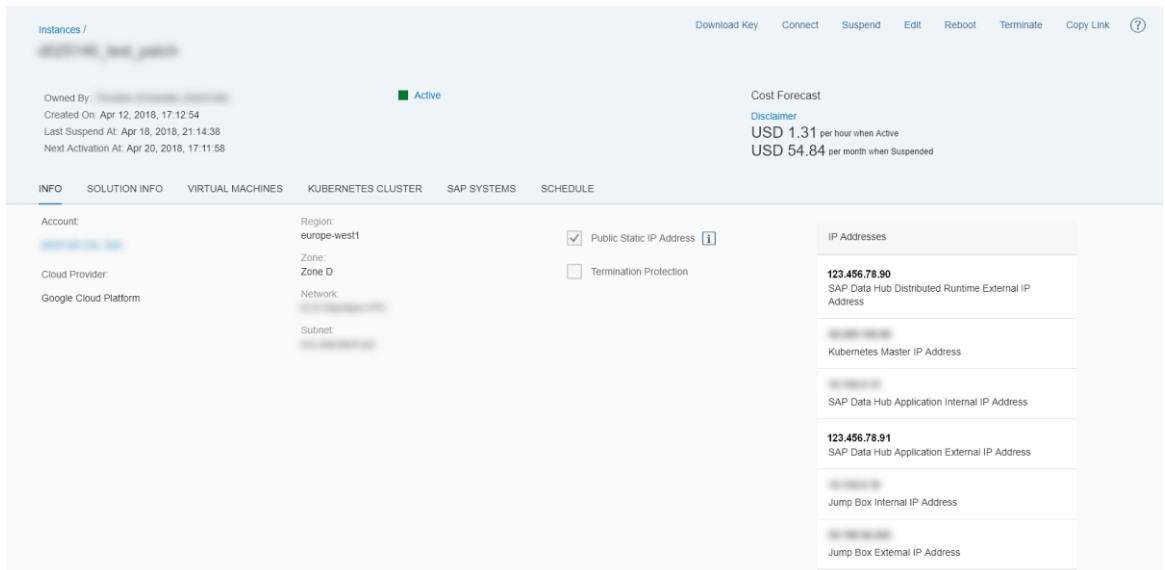
3.2 Mapping your local hosts file

All solution instances of SAP Data Hub, trial edition use the same hostnames `vhcalhxdb` and `vhcalruntime`. These hostnames are not fully qualified and you hence need to map the actual (external) IP addresses against them. By doing so, your local computer can resolve the hostnames whenever you use them (for example to access the SAP Data Hub Application via a web browser). Proceed as follows to do the mapping:

1. Look up the external IP addresses for your solution instance in the SAP Cloud Appliance Library.

Example (for your solution instance the IP addresses will be different!):

- SAP Data Hub Application External IP Address: 123.456.78.91
- SAP Data Hub Distributed Runtime External IP Address: 123.456.78.90



2. Open a text editor (e.g. Notepad in case of Microsoft Windows) as administrator (e.g. for Microsoft Windows search for Notepad on your computer, open the context menu of Notepad and click Run as administrator).
3. Click File → Open and enter the following path:
 - For Microsoft Windows operating system: `c:\windows\system32\drivers\etc\hosts`
 - For Linux operating system: `/etc/hosts`
4. Ensure to select All Files (*.*) .
5. Open the hosts file and add the following lines to it:

```
# SAP Data Hub, trial edition
# SAP Data Hub Application
<SAP Data Hub Application External IP Address> vhcalhxdb
# SAP Data Hub Distributed Runtime
<SAP Data Hub Distributed Runtime External IP Address> vhcalruntime
```

6. Replace <SAP Data Hub Application External IP Address> and <SAP Data Hub Distributed Runtime External IP Address> by the external IP addresses which you have retrieved from SAP Cloud Appliance Library. Example:

```
# SAP Data Hub, trial edition
# SAP Data Hub Application
123.456.78.91 vhcalthxdb
# SAP Data Hub Distributed Runtime
123.456.78.90 vhcalthruntime
```

7. Save the hosts file and exit the text editor.

3.3 Accessing the SAP Data Hub Application

3.3.1 Accessing the Application UI

The Application UI particularly consists of the SAP Data Hub Cockpit and the SAP Data Hub Modeling tool:

- The SAP Data Hub Cockpit is the central entry point for end-users of SAP Data Hub. It provides you with a single point of access to a range of tools.
- The SAP Data Hub Modeling tool allows you to create task workflows.

You can access the Application UI via a web browser (Microsoft Internet Explorer, Google Chrome, Mozilla Firefox) using the information in the tables below:

SAP Data Hub Cockpit

| Name | Value | Description |
|----------|---|---|
| URL | https://vhcalthxdb:51076/ | SAP Data Hub Cockpit |
| User | DATAHUB | User for the Application UI |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

Attention: If you get an error "There is no any resources matched to request path /extension/bdh/tools/overview" while opening the SAP Data Hub Cockpit, then please proceed as described in 7 Troubleshooting to resolve this problem.

Quick Links

| | | | | | |
|---|---|---|--|--|---|
| Landscape Add New Systems Add New Connection Add New Zone | Modeling SAP Data Hub Model... Configure Workspace | Discovery Explore Connections Recent Profile Results | Monitoring Task Workflows Data Pipelines Direct Task Execution | Featured Links Pipeline Modeler Vora Tools System Management | Getting Started SAP Online Docs Settings |
|---|---|---|--|--|---|

From the SAP Data Hub Cockpit, you can use the Quick Links to navigate to the SAP Data Hub Modeling tool as SAP Data Hub System Management, SAP Data Hub Pipeline Modeler as well as SAP Vora Tools. For the three last-mentioned you need to provide tenant, user and password after clicking on the link. You find this information in chapter 3.4.1 Accessing the Distributed Runtime UIs.

SAP Data Hub Modeling tool

| Name | Value | Description |
|----------|---|---|
| URL | https://vhcalhxedb:51058/ | SAP Data Hub Modeling tool |
| User | DATAHUB | User for the Application UI |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

Remark: You might see an error message that the web browser is not able to verify the security certificate of <https://vhcalhxedb>. The reason is that the used security certificate is self-signed and the web browser therefore cannot find a trusted root certificate. You need to confirm the error message to proceed.

3.3.2 Accessing the XS Advanced Administration tool

The XS Advanced Administration tool, for example, allows you to manage application roles and users, monitor applications and view audit logs.

You can access the XS Advanced Administration tool via a web browser (Microsoft Internet Explorer, Google Chrome, Mozilla Firefox) using the information in the table below:

| Name | Value | Description |
|----------|---|---|
| URL | https://vhcalhxedb:51015/ | XS Advanced Administration tool |
| User | XSA_ADMIN | User for the XSA Administration and Monitoring Tools |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

Remark: You might see an error message that the web browser is not able to verify the security certificate of <https://vhcalhxedb>. The reason is that the used security certificate is self-signed and the web browser therefore cannot find a trusted root certificate. You need to confirm the error message to proceed.

3.3.3 Accessing the SAP HANA database

The SAP Data Hub Application uses the SAP HANA database as persistence. All data is stored in a dedicated multi-tenant database container HXE. You can access the SAP HANA database either via SAP HANA Cockpit or SAP HANA Tools ([Eclipse plug-in](#)).

SAP HANA Cockpit

| Name | Value | Description |
|----------|---|---|
| URL | https://vhcalhxedb:51041 | SAP HANA Cockpit |
| User | XSA_ADMIN | User for the XSA Administration and Monitoring Tools |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

Remark: You might see an error message that the web browser is not able to verify the security certificate of <https://vhcalhxedb>. The reason is that the used security certificate is self-signed and the web browser therefore cannot find a trusted root certificate. You need to confirm the error message to proceed.

SAP HANA Tools

| Name | Value | Description |
|-----------------|--|---|
| Hostname | vhcalhxedb | Hostname of the SAP HANA system |
| Instance Number | 90 | Instance number of the central instance of the SAP System |
| Mode | Multiple Containers | The SAP HANA system is configured for multi-tenant database containers. |
| Database | System database Tenant database HXE | You can connect to both, the system database as well as tenant database HXE. Attention: To connect to tenant database HXE, you need to follow the description at the end of this chapter prior to creating the connection. |
| Username | SYSTEM XSA_ADMIN | These are the standard users which you can use to access the database server. |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

Connecting from SAP HANA Tools to tenant database HXE:

To connect from SAP HANA Tools to tenant database HXE, you once need to configure hostname resolution prior to creating the connection. Thereto proceed as follows in SAP HANA Studio:

1. Connect to the system database using the SYSTEM user.
2. Open the Administration.
3. Click on the Configuration tab and use the value use_default_route as a filter.

4. Open the context menu of public_hostname_resolution and click Add parameter...
5. Select System as scope. Press Next.
6. Enter map_vhcalhxedb as key and <SAP Data Hub Application External IP Address> (i.e. the external IP address which you have also maintained in the local hosts file) as value.

3.3.4 Accessing the Operating System

You can access the SAP Data Hub Application on operating system level via the secure shell protocol. For a detailed description, go to [this FAQ wiki page](#) and check this question: How to connect to a running instance via the secure shell protocol (SSH)?

On operating system level the following users and user groups are available:

| Name | Description |
|--------|---|
| root | root / super user with access to all commands and files |
| hxeadm | SAP system administrator |
| hxeshm | Group needed by SAP HANA database on OS level for shared memory operations |
| sapadm | SAP database administrator |
| sapsys | Group containing all <SID>adm users (should be a group in a central user storage like LDAP, NIS, or Active Directory) |

3.4 Accessing the SAP Data Hub Distributed Runtime

3.4.1 Accessing the Distributed Runtime UIs

The Distributed Runtime UIs consist of the SAP Data Hub System Management, the SAP Data Hub Pipeline Modeler and the SAP Vora Tools:

- The SAP Data Hub System Management allows you to manage applications, in particular the SAP Data Hub Pipeline Modeler and the SAP Vora Tools, as well as corresponding users.
- The SAP Data Hub Pipeline Modeler allows you to create data-driven applications, so-called data pipelines.
- The SAP Vora Tools provide you with a data modeling environment for creating and maintaining tables and views.

You can access the Distributed Runtime UIs via a web browser (Microsoft Internet Explorer, Google Chrome, Mozilla Firefox) using the information in the tables below:

SAP Data Hub System Management

| Name | Value | Description |
|-----------|---|--|
| URL | https://vhcalruntime/home/ | SAP Data Hub System Management |
| Tenant ID | system default | System tenant Default tenant Attention: SAP Data Hub Pipeline Modeler and SAP Vora Tools are only available in default tenant. |
| User | DATAHUB | User for the Distributed Runtime UIs |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

SAP Data Hub Pipeline Modeler

| Name | Value | Description |
|-----------|---|---|
| URL | https://vhcalruntime/app/pipeline-modeler | SAP Data Hub Pipeline Modeller |
| Tenant ID | default | Default tenant Attention: if you are logged into the system tenant (in another browser window) SAP Data Hub Pipeline Modeler is not available (error 404). Log off from the system tenant. |
| User | DATAHUB | User for the Distributed Runtime UIs |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

SAP Vora Tools

| Name | Value | Description |
|-----------|---|--|
| URL | https://vhcalruntime/app/vora-tools | SAP Vora Tools |
| Tenant ID | default | Default tenant Attention: if you are logged into the system tenant (in another browser window) SAP Vora Tools is not available (error 404). Log off from the system tenant. |
| User | DATAHUB | User for the Distributed Runtime UIs |
| Password | <Master Password> | The initial master password of the system you provided in the SAP Cloud Appliance Library when creating the instance. |

Remark: You might see an error message that the web browser is not able to verify the security certificate of <https://vhcalruntime>. The reason is that the used security certificate is self-signed and the web browser therefore cannot find a trusted root certificate. You need to confirm the error message to proceed.

3.4.2 Accessing the Kubernetes Cluster

The SAP Data Hub Distributed Runtime uses Kubernetes. In case of the SAP Data Hub, trial edition it uses the Google Kubernetes Engine.

You can access the Kubernetes cluster used by the SAP Data Hub, trial edition via the Google Cloud Platform Console as well as the Google Cloud SDK (in particular gcloud and kubectl).

3.4.3 Accessing SAP Vora Diagnostics UIs

SAP Vora Diagnostics is an open-source toolchain that supports you with monitoring and troubleshooting. It provides you with Grafana (for metrics monitoring) and Kibana (for trace log analysis) UIs.

You can access the SAP Vora Diagnostics UIs via a web browser (Microsoft Internet Explorer, Google Chrome, Mozilla Firefox). Thereto you need to create port forwards as described in [the documentation](#). This requires that you have the Google Cloud SDK installed on your local computer.

3.5 Accessing the Jump Box

You can access the Jump Box on operating system level via the secure shell protocol. This is only necessary for troubleshooting. For a detailed description, go to [this FAQ wiki page](#) and check this question: How to connect to a running instance via the secure shell protocol (SSH)?

On operating system level the following users and user groups are available:

| Name | Description |
|------|---|
| root | root / super user with access to all commands and files |

Using kubectl on the Jump Box

The Kubernetes command line interface (kubectl) is preinstalled on the Jump Box. This allows you to easily connect to the containers (pods) of the Kubernetes cluster used by the SAP Data Hub Distributed Runtime.

If you, for example, run a kubectl get nodes command, you get a list of the nodes (virtual machines) of the Kubernetes cluster.

```
lkgint-166738-...-jump-box:~ # kubectl get nodes
NAME                                STATUS    ROLES    AGE    VERSION
gke-lkgint-166739-...-clus-sapcal-d7ae12e2-2lm1  Ready    <none>   2h     v1.8.9-gke.1
gke-lkgint-166739-...-clus-sapcal-d7ae12e2-pzj4  Ready    <none>   2h     v1.8.9-gke.1
gke-lkgint-166739-...-clus-sapcal-d7ae12e2-vg6f  Ready    <none>   2h     v1.8.9-gke.1
lkgint-166738-...-jump-box:~ #
```

For more information refer to the [Kubernetes documentation](#).

4 Connecting to Google Cloud Storage

While evaluating and testing SAP Data Hub, you often want to connect to a data lake and/or object storage. With SAP Data Hub, you can connect to Amazon S3, Azure Data Lake (ADL), Azure Storage Blobs (WASB), HDFS and Google Cloud Storage.

Since the SAP Data Hub, trial edition uses Google Cloud Platform as cloud provider, you can easily use Google Cloud Storage (connections to other object storages are technically possible as well):

1. First create a bucket in Google Cloud Storage (see [Google Cloud Documentation](#)). For the sake of simplicity, you can create the bucket in the same Google Cloud Platform project where the solution instance was created (but that is not a must).
2. Then open the SAP Data Hub Cockpit (<https://vhcalhxdb:51076/>) with the user DATAHUB and password <Master Password> (see 3.3.1 Accessing the Application UI).
3. Navigate to Landscape Management and create a new connection by pressing the Add button (in the lower right of the screen).

| ID | Type | Agent | Zone Name | Description |
|------------------|----------|--------------------------|-----------|-------------------------|
| VORA_SYS_DEFAULT | SAP VORA | data-hub-flow-agent 5050 | default | Default SAP Vora system |

Connection Summary for VORA_SYS_DEFAULT

2 Connection(s)

50.0% SAP Data Hub Pipeline 50.0% SAP VORA Catalog

Active Connections

| ID | Connection |
|----------------------------|-----------------------|
| VORA_PIPELINE_CONN_DEFAULT | vsystem-internal 8796 |
| VORA_CATALOG_CONN_DEFAULT | |

4. Use GCS_CONN_DEFAULT as ID for the connection (the ID matters!). Then enter the connection details.

New Connection

*ID: GCS_CONN_DEFAULT i

*System Name: VORA_SYS_DEFAULT v i

*Connection Type: Google Cloud Storage v i

Description: Google Cloud Storage Default Connection i

*Project ID: i

Key File: i

Validate Add Cancel

If you created the bucket in the same Google Cloud Platform project where the solution instance was created, you are able to use the same service account (see 2.1 Prerequisite: Cloud Provider Account) and hence the same key file as when linking the SAP Cloud Appliance Library with the Google Cloud Platform project.

5. Validate the connection. Then (assuming the validation was successful) save the connection by pressing the Add button.

- Now edit the (already existing) VORA_CATALOG_CONN_DEFAULT connection by pressing the Edit Connection button (in the upper right of the screen).

Landscape Management / Connection Management

Connection Management

Manage connections

Search System Name (VORA_SYS_DEFAULT)

| ID | Type | Connection | Description | System Name | Zone Name |
|----------------------------|-----------------------|-----------------------|-----------------------------|------------------|-----------|
| VORA_PIPELINE_CONN_DEFAULT | SAP Data Hub Pipeline | vsystem-internal:8796 | Default Pipeline Connection | VORA_SYS_DEFAULT | default |
| VORA_CATALOG_CONN_DEFAULT | SAP VORA Catalog | | Default Catalog Connection | VORA_SYS_DEFAULT | default |
| GCS_CONN_DEFAULT | Google Cloud Storage | | | VORA_SYS_DEFAULT | default |

- Use GCS as storage type and the bucket you have created to enter the URI (the format is gs://<Bucket Name>). Confirm the password (this is the <Master Password>).

Edit VORA_CATALOG_CONN_DEFAULT

*ID: i

*System Name: i

*Connection Type: i

Description: i

*Connection Configuration: i

*Storage Type: i

*Storage Base URI: i

*User: i

*Password: i

Validate Save Cancel

Validate the connection. Then (assuming the validation was successful) save the connection by pressing the Save button.

5 Licenses

5.1 Running Solution as a Trial for a Free Period

This solution can be used with a Free Trial License Agreement for the configured free period. You will be asked to agree to the Free Trial License Agreement during the instantiation steps.

Once you create the solution instance, the SAP system will generate a temporary license key that is sufficient for exploration purpose. After the expiration of the pre-installed temporary license a valid license is required to keep using the solution instance.

Note that you are not allowed to install license keys under the Free Trial License Agreement. You can continue the solution with the Product License Agreement any time prior to the end of the free period by unlocking it.

5.2 Running Solution with a Product License Key

To use the instance created from this solution under your own SAP Product License Agreements, you have to unlock the solution in SAP Cloud Appliance Library. As a prerequisite, you must own the required SAP Product licenses and need to purchase the SAP Cloud Appliance Library subscription package. For more information, see [Unlocking Solutions](#).

6 Security Aspects

Be aware that creating your instances in the public zone of your cloud computing platform is convenient but less secure. Ensure that only port 22 (SSH) is opened when working with Linux-based solutions and port 3389 (RDP) when working with Windows based solutions. In addition, we also recommend that you limit the access to your instances by defining a specific IP range in the Access Points settings, using [CIDR notation](#). The more complex but secure alternative is to set up a virtual private cloud (VPC) with VPN access, which is described in [this tutorial on SCN](#).

The list below describes the ports opened for the security group formed by the server components of your solution instance:

| Protocol | Port | Description |
|----------|-------------|---|
| SSH* | 22 | Used for SSH connection to Linux-based servers |
| HTTP(s)* | 4390 | SAP Web Dispatcher (HANA) |
| HTTP(s)* | 8090 | SAP Web Dispatcher (HANA) |
| Custom* | 39013 | SQL and MDX access port to the SYSTEM database |
| Custom* | 39015 | SQL and MDX access to the first tenant of a HANA system – in the case of HXE, a user has to initiate the tenant before trying to connect to this port |
| Custom* | 39041-39045 | Additional open ports for 5 Tenants |
| Custom* | 39017 | Port for statistics server connections |
| HTTP(s)* | 39033 | Default XSA port if hostname routing is used for HANA |
| HTTP(s)* | 39032 | Default XSA port if hostname routing is used for HANA |
| HTTP(s)* | 39030 | XS-controller managed Web Dispatcher |
| HTTP(s)* | 59013 | Instance Agent |
| HTTP(s)* | 59014 | Instance Agent SSL |
| HTTP(s) | 51000-51099 | XSA application instances |
| Custom* | 39026-39030 | Ports for SDS streaming clients |
| Custom* | 39040 | Default DPSTServer Port |
| Custom* | 1128-1129 | SAP Host Agent |
| Custom* | 53075 | WEB based IDE for XSA Development |
| Custom* | 53030 | DICore Service |
| TCP | 443 | SAP Data Hub System Management |

* from solution "SAP HANA, express edition"

You must change the initial user passwords provided by SAP when you log onto the system for the first time.

Note that when using **HANA based appliances**, HANA systems are not installed individually but **cloned from a template system**. As a consequence of this cloning process, the existing root keys are cloned. For more information, see this [SAP Note 2134846 - HANA encryption key handling during system cloning](#).

For more information about security vulnerabilities, see this [community page](#).

7 Troubleshooting

Error “There is no any resources matched to request path /extension/bdh/tools/overview”

You open the SAP Data Hub Cockpit. The link to the SAP Data Hub Modeling tool is not available. You see an error message at the bottom of the screen “There is no any resources matched to request path /extension/bdh/tools/overview”.

Reason: program error (will be fixed in a future version of SAP Data Hub, trial edition).

Solution: Access the operating system of the virtual machine (hostname vhcalthxdb) hosting the SAP Data Hub Application as described in 3.3.4 Accessing the Operating System and run the following commands. Replace <Master Password> with the password you provided in the SAP Cloud Appliance Library when creating the instance.

```
sudo su - hxeadm
xs login -a https://vhcalthxdb:39030 -u XSA_ADMIN -p <Master Password> -o
HANAExpress -s DATAHUB --skip-ssl-validation
xs restart webide
xs restart di-core
```

Error during profiling “Adapter Error Message “code”: “ECONNRESET”

You profile a file in Discovery. After a while the file’s profiling status is displayed as erroneous. In SAP Data Hub Pipeline Modeler you see a PROFILE::com.sap.data.discovery.generated.objects... pipeline. This pipeline initially in status pending and later in status dead.

Reason: timeout (system behavior will be improved)

Solution: Wait around 5 minutes (more precisely until the PROFILE::com.sap.data.discovery.generated.objects... pipeline is dead). Then start profiling again.

8 Appendix

Installed Software Components

| Name | Release | Support Package Stack |
|----------------------------------|-------------------|-----------------------|
| HDB_LCM_LINUX_X86_64* | 2.00.021.00 | 2 |
| HDB_SERVER_LINUX_X86_64* | 2.00.021.00 | 2 |
| HDB_AFL_LINUX_X86_64* | 2.00.021.00 | 2 |
| HDB_EML_AFL_LINUX_X86_64* | 2.00.021.00 | 2 |
| XSA_RT_10_LINUX_X86_64* | 1.0.66 | 2 |
| XSA_CONTENT_10* | 1.0.66 | 2 |
| XSAC_SAP_WEB_IDE_20 | 4.2.18 / 4.2.31 | 2 |
| XSAC_HRTT_20 | 2.4.65 | 4 |
| HANA_COCKPIT_20* | 2.3.9 | 2 |
| HCO_HANA_SHINE* | 1.202.0 | 2 |
| SAP_HANA_STREAMING* | 2.00.021.00 | 2 |
| HANA_SDI* | 2.00.021.00 | 2 |
| HANA_DP_AGENT_20_LIN_X86_64 * | 2.00.021.00 | 2 |
| XSA_CLIENT_10* | 2.00.021.00 | 2 |
| HDB_CLIENT_LINUX_X86_64* | 2.2.26.1504297370 | 2 |
| HDB_CLIENT_LINUX_PPC64LE* | 2.2.26.1504297370 | 2 |
| HDB_CLIENT_WINDOWS_X86_64* | 2.2.26.1504297370 | 2 |
| HDB_CLIENT_NTINTEL* | 2.2.26.1504297370 | 2 |
| HDB_CLIENT_MACOS* | 2.00.020.00 | 2 |
| XSAC_DH_COCKPIT_1.0 | 1.3.23 | 3 |
| XSAC_DH_DISCOVERY_1.0 | 1.3.19 | 3 |
| XSAC_DH_MD_1.0 | 1.3.22 | 3 |
| XSAC_DH_OBJECTSERVICES_1.0 | 1.3.29 | 3 |
| XSAC_DH_SECURITY_1.0 | 1.3.16 | 3 |
| XSAC_DH_TOOLS_1.0 | 1.3.24 | 3 |

| Name | Release | Support Package Stack |
|--------------------------------|---------|-----------------------|
| SAP DATA HUB DISTRIB RUNTM 1.0 | 1.3.32 | 3 |
| SAP DATA HUB FLOW AGENT 1.0 | 2.2.37 | 3 |

* from solution "SAP HANA, express edition"

Detailed information (incl. licenses) about 3rd party software used can be found in the [Free & Open Source Notices](#).



www.sap.com/contactsap

© 2018 SAP SE or an SAP affiliate company. All rights reserved.
No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies. Please see www.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.