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About the tutorial

SAP HANA Cloud is an in-memory Cloud based platform provided by SAP Business Technology Platform (BTP). It is a revolutionary platform, which is best suited for performing real-time analytics, and developing and deploying real-time applications and to extend On-premise landscape to scalable cloud solution. This tutorial will teach you the basics of SAP HANA Cloud platform and managing Database and other key features. Each of these sections contain related topics with screenshots explaining the SAP HANA Cloud platform features.

Audience

This tutorial has been prepared for anyone who has a basic knowledge of SQL and Database Cloud concepts. After completing this tutorial, you will find yourself at a moderate level of expertise in administration of HANA Cloud environment.

Prerequisites

Before you start proceeding with this tutorial, we assume that you are well-versed with basic database concepts. You should have a good exposure to SQL, and other Cloud based platforms.

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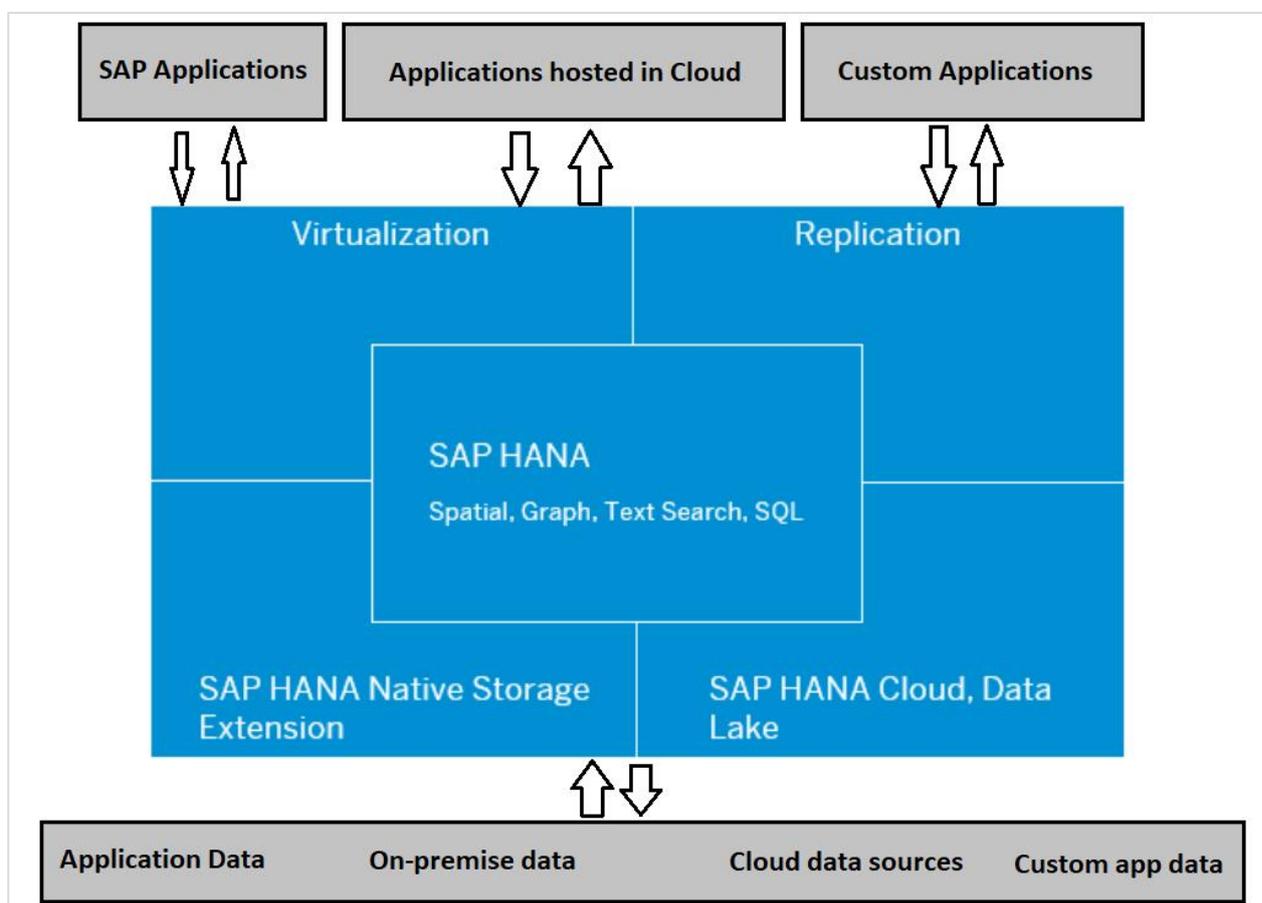
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1. SAP HANA Cloud — Overview

SAP HANA Cloud platform is cloud-based Database service hosted as Platform-as-a service and provides in-memory HANA database management capabilities in single cloud solution for all the application requirements. You can experience the power features of HANA database on cloud platform. You can extend your on-premise landscape to HANA cloud or can also deploy HANA cloud as standalone solution for data needs.

As cloud-based Database platform, you can integrate the data from different streams and sources and in memory engine allows you to make faster decision based on live data. Using SAP HANA cloud, you can store, access and execute data processing at one place and HANA columnar data processing enables processing of data in real time. It provides you the benefits such as software updates, elasticity, low cost of ownership to maintain the platform.



This diagram describes the key features of SAP HANA cloud platform. With availability of SAP HANA cloud, you can bind SAP applications running on cloud platform to HANA database. You can also manage how to access HANA database using variety of user interface tools available in HANA cloud platform.

Following are the key benefits of using HANA cloud:

- Automatic software updates

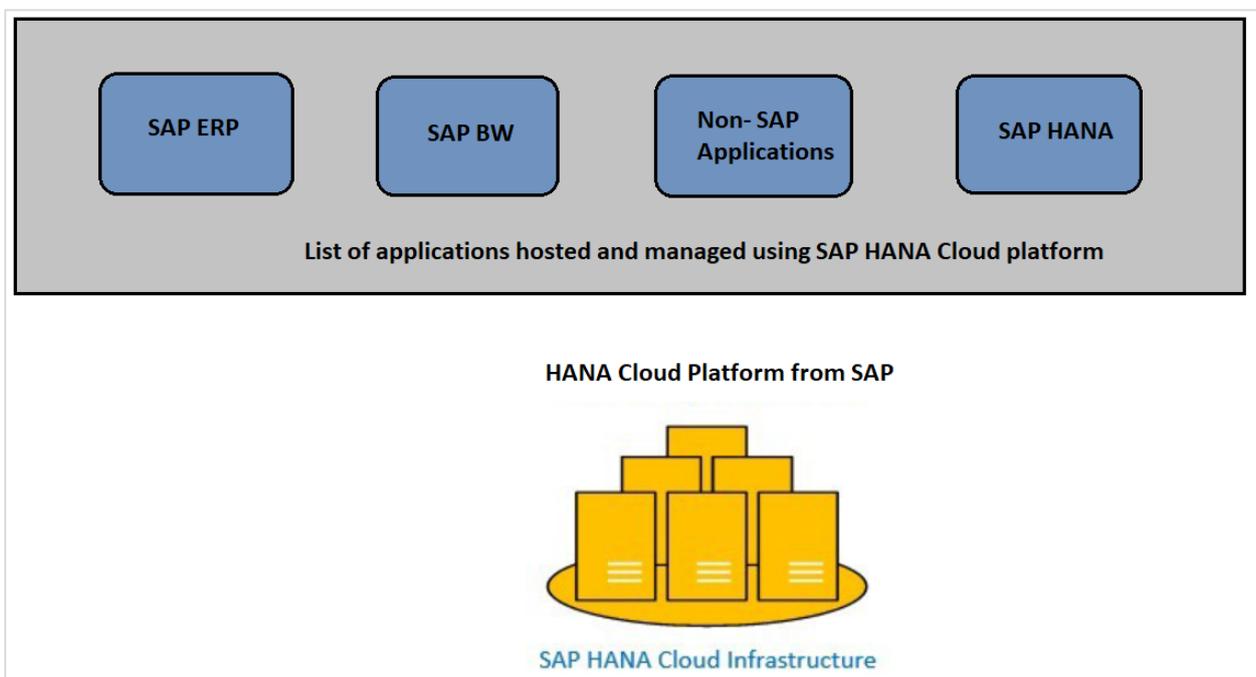
- Low cost of ownership
- Elasticity
- Ease of access to database using HANA cloud tools

2. SAP HANA Cloud — Benefits

SAP HANA cloud platform enables you to access the data stored in HANA database in real time and to bind the application hosted on cloud or on-premise. HANA cloud provides better efficiency, governance and compliance, low cost of ownership and faster ROI. SAP HANA in-memory column-based database improves the flexibility, memory, performance, and data visualizations in real time.

Following are the key benefits of using SAP HANA Cloud platform:

- Parallel processing, performance optimization and integration
- High availability and recovery
- Auto scale up and easy scale out infrastructure
- Manage database workload
- Easy monitoring of system status, services and performance
- Exposure of data in HANA cloud
- Access to SAP HANA cloud from variety of platforms like Windows, Linux and MacOS.
- Easy creation of DB objects using Procedures and Stored Procedures
- Easy error diagnosis, using diagnostic tools
- Creation of data models using inbuilt tools in SAP Cloud and Web IDE applications



Easy Integration

You can easily integrate data from on-premise applications, non-SAP and SAP applications to Cloud based HANA platform. You can easily manage life cycle service, business processes in real time, HANA application platform, automation of few processes and connectivity between HANA cloud and on-premise applications securely.

Strong Security Features

With strong role-based authentication, you can easily define that right people has access to right data only. You can configure single sign-on authentication for developers and managing identities using overall lifecycles.

Parallel Processing

Based on columnar based storage, SAP HANA platform allows you to perform parallel and multiprocessing of data. All the aggregations can be performed during run time due to highly efficient HANA processing engines.

Storage

HANA column-based storage allows you to store large volume of data, manage unstructured data, binding the database to Cloud.

Predictive Analysis

With the use of in-memory engine, business users can access to real time data and perform different analytics functions:

- Predictive Analysis of business insight
- Continuous real time analytics

3. SAP HANA Cloud — Architecture

SAP HANA cloud is a platform as a service solution to provide the in-memory columnar based Database engine for development and runtime on Cloud applications. Developers can easily create scalable, an interactive and efficient applications on top of HANA DB.

Developers can use different scenarios on SAP HANA Cloud platform for application development:

Scalability of On-demand Cloud Solution

Easily scalable solution for already existing application running in Cloud and extending the infrastructure as per requirement.

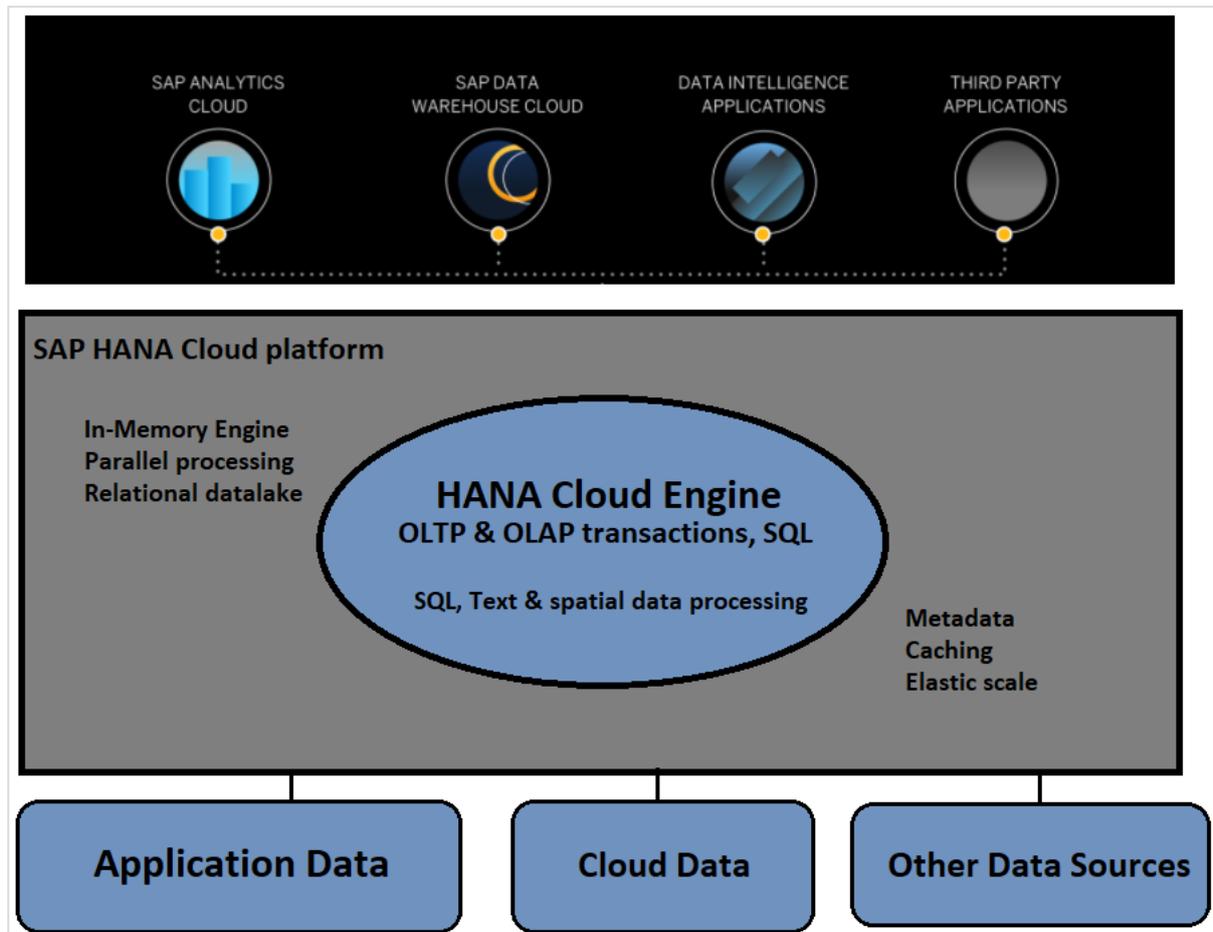
Scalability of On-premise Solution

With existing applications running in on-premise data centers, you can extend existing application on Cloud. This is called a Hybrid approach of landscape for app development.

New Cloud based Solution

To build the new custom applications running on Cloud based platform.

In below architecture diagram, you can see the basic approach of SAP HANA cloud platform:



Components in SAP HANA Cloud platform

In SAP HANA Cloud platform, you have the below key components:

- SAP HANA Database
- SAP HANA Application Services
- Developer Experience

SAP HANA Database Service

At the bottom of HANA Cloud platform service, you have in-memory HANA database where data can be stored in row and columnar based format. HANA database is full-fledged application platform which allows you to perform analysis on Text, graphical and spatial data, data manipulation like Predictive Analysis, etc.

SAP HANA Application Services

In HANA Cloud platform, developers can build XS based applications on Cloud platform with no additional cost involved.

Developer Experience

To start with application development on HANA based platform, developers should set few of the prerequisites to use Cloud-based platform like Eclipse based features. SAP HANA Native Storage Extension is enabled by default in HANA Cloud. DB developers can select

specific tables, columns to use Native storage. Initial size of NSE is 10% of HANA cloud instance memory size however this can also be changes after instance creation.

For Example,

SAP HANA Memory	NSE Buffer Cache	SAP HANA in-memory data (compressed)	NSE Data Volume Size	Total SAP HANA Database Data Size
60 GB	6 GB	30 GB - 6 GB (24 GB)	48 GB	72 GB

4. SAP HANA Cloud — Key capabilities

SAP HANA Cloud is based on Business Technology platform and powered by strong HANA in-memory database engine. Below listed key capabilities of HANA Cloud:

Power in-Cloud platform

HANA cloud provides low cost of total owner and Elastic within the cloud platform. Processing of data stored in HANA database in real-time and analytical reports.

Centrally Stored

Centrally stored with data coming from multiple data sources. Simplified and streamlined access of all data in one storage solution. Fix the issues like data duplication using SAP HANA smart data integration and virtualization options.

High Performance

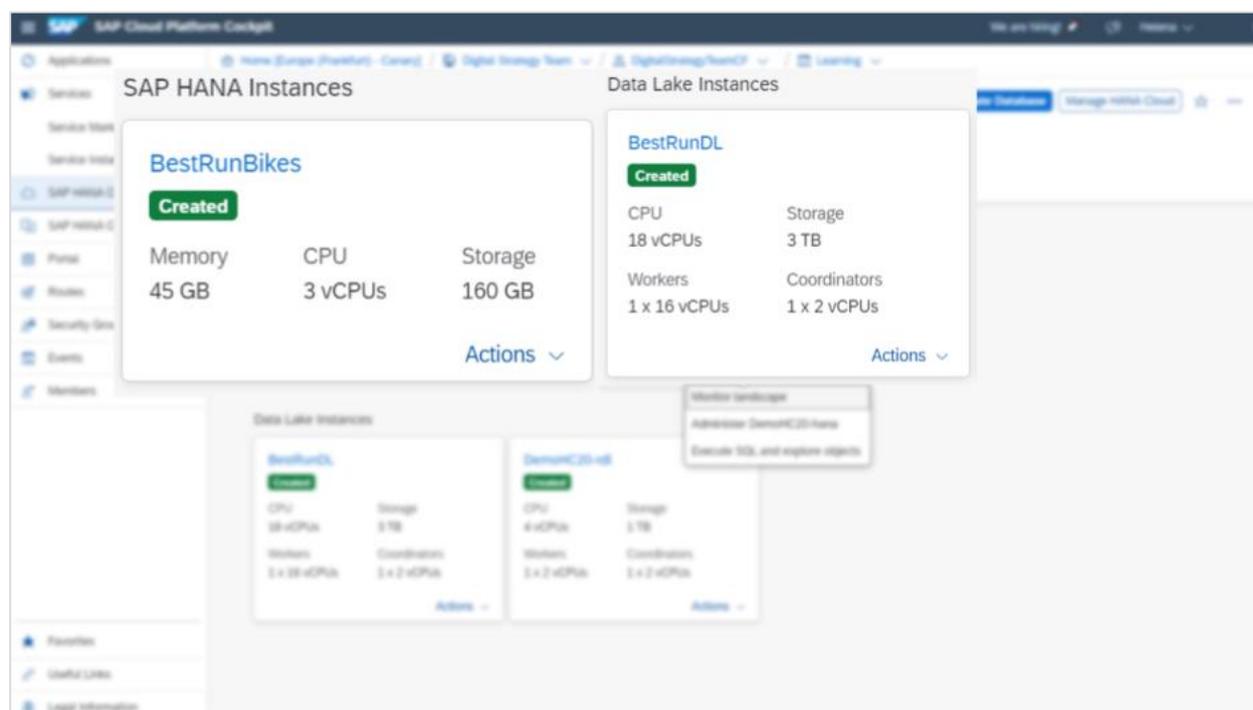
Easy scaling up/down with no additional costs and process both transactional and analytical data. High compute and storage.

Application Development

Using HANA cloud, you can easily develop SAP and custom applications. Scalable query engine and support.

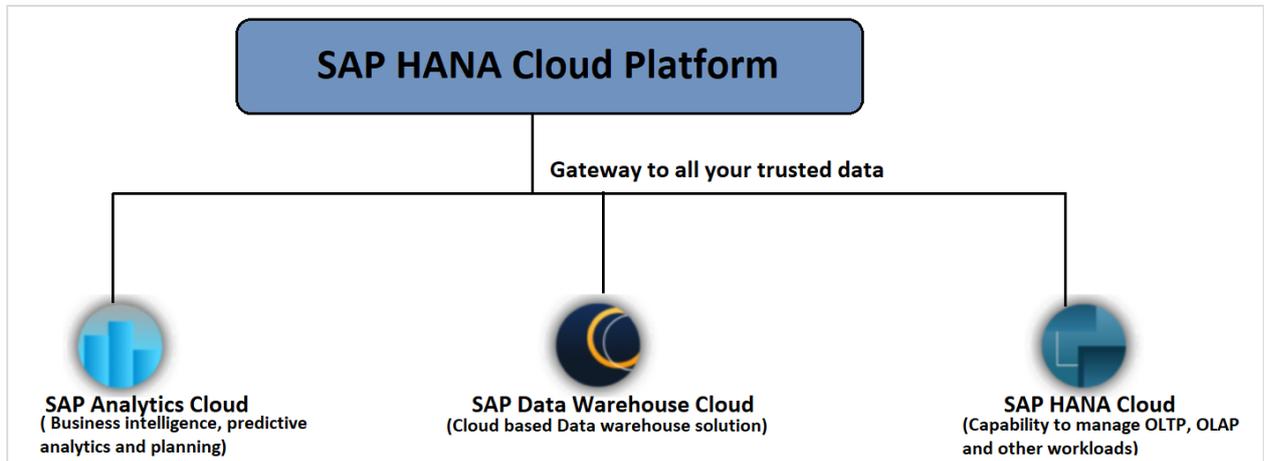
Security

Data protection capabilities, security logging and analytics for system event and logs.



SAP HANA Cloud platform can be used with below 3 main capabilities:

- SAP Analytics Cloud
- SAP Data Warehouse Cloud
- SAP HANA Cloud

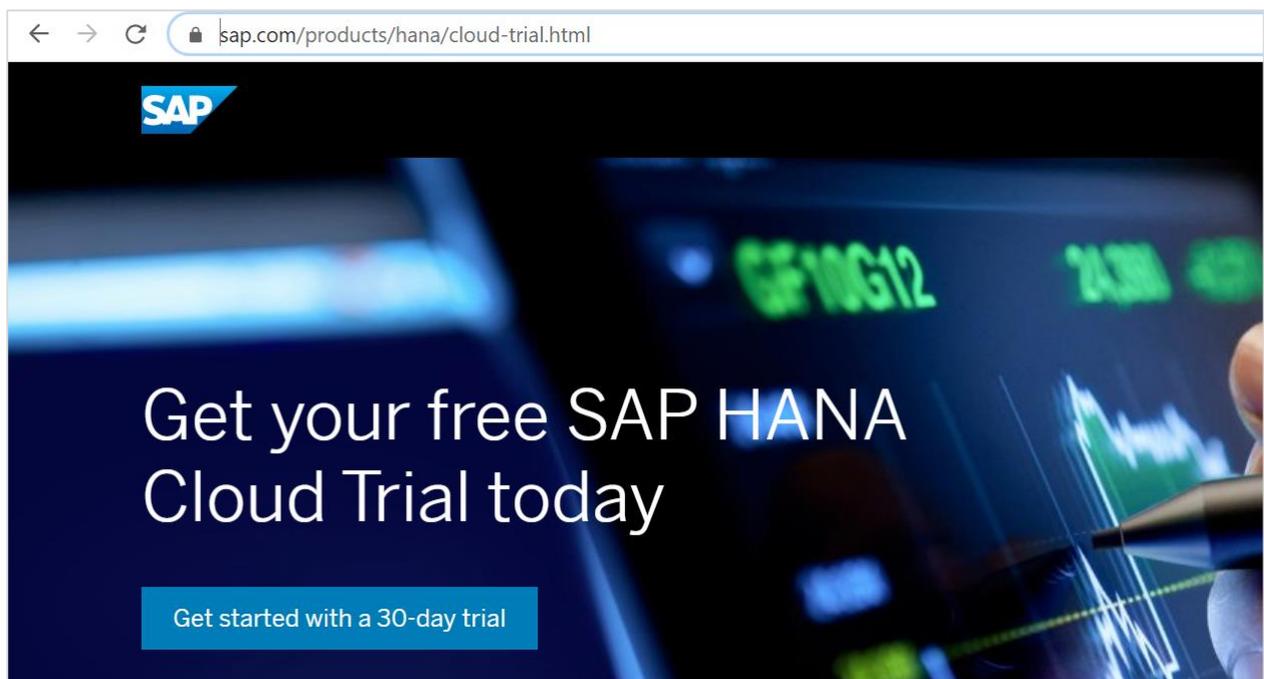


5. SAP HANA Cloud — Enabling Trial

SAP provides 30 days free trial for HANA cloud and this can be extended up to 365 days. It includes starter scenarios and you can extend your on-premise solution to cloud or can use HANA cloud as single solution for deploying your application.

To start your free 30 days trial, navigate to this URL:

<https://www.sap.com/products/hana/cloud-trial.html>



Click on Get started with a 30-day trial, to setup the trial it involves 3 steps:

- Registration
- Verify your email
- Access all Resources

For registration, you need to provide a valid email address, First Name, Last Name, Company, Country, Phone# and Relations to SAP. Provide the password at the time of registration and after Accepting Terms and Conditions, click on Submit button.

If you are already an existing user, you can use Login option on right to directly login to HANA Cloud platform.

Tell us about yourself

<input type="text" value="E-mail address *"/>	<input type="text" value="First name *"/>
<input type="text" value="Last name *"/>	<input type="text" value="Company *"/>
Country/Region United States ∨	Phone  +1 XXX-XXX-XXXX
Department * ∨	Relationship to SAP * ∨
Create password Show	Confirm password Show

Must have at least 8 characters.

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

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

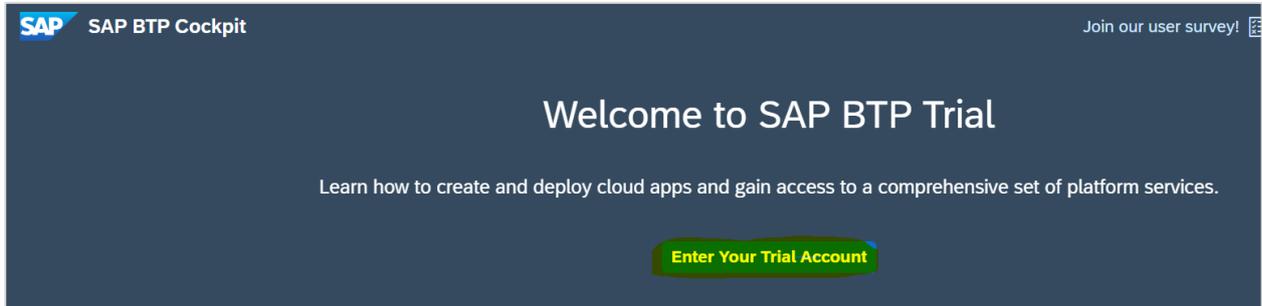
This site is protected by reCAPTCHA and the Google [Privacy Policy](#) and [Terms of](#)

Already registered?

[Log in](#)

After completing the registration, you will get a welcome email on your provided email ID. It guides you to access the HANA Cloud URL login using below options:

SAP BTP trial home page → Next is to Click on the "Enter Your Trial Account" button. This takes you to the SAP Business Technology Platform Cockpit.



Click on the "trial" subaccount tile.

[New Subaccount](#)
[Switch Global Account](#)
[Delete Trial Account](#)

All Environments ∨

 trial

Provider: Amazon Web Services (AWS)

Region:  Europe (Frankfurt)

Description: -none-

Environment: Multi-Environment





Under Spaces, click on the "dev" space as shown below:

Legal Disclaimers for SAP BTP Trial

We have updated our legal documents. To access and use SAP BTP Trial, please read and accept the documents below:

Terms and Conditions

I have read and understood the Terms and Conditions of [SAP BTP Trial](#). *

*Required

Accept

SAP® ID Service

Once you are logged in, you will see SAP BTP cockpit home page with your Global Account number. Click on top right icon to see validity of your trial period. When your trial expires, your application hosted on HANA cloud will stop working however your data will not be deleted. You have an option to extend the trial up to 365 days as below:

The screenshot displays the SAP BTP cockpit interface. At the top right, there is a notification for a user survey and a trial period indicator showing '7' days. The main content area shows the 'Global Account' section with a subdomain and buttons for 'New Subaccount', 'Switch Global Account', and 'Delete Trial Account'. Below this, there is a card for a trial account with details: Provider: Amazon Web Services (AWS), Region: Europe (Frankfurt), Description: -none-, and Environment: Multi-Environment. A 'Trial Period' pop-up window is open, stating 'Your free trial expires in 7 days.' and providing information on how to extend the trial up to 365 days.

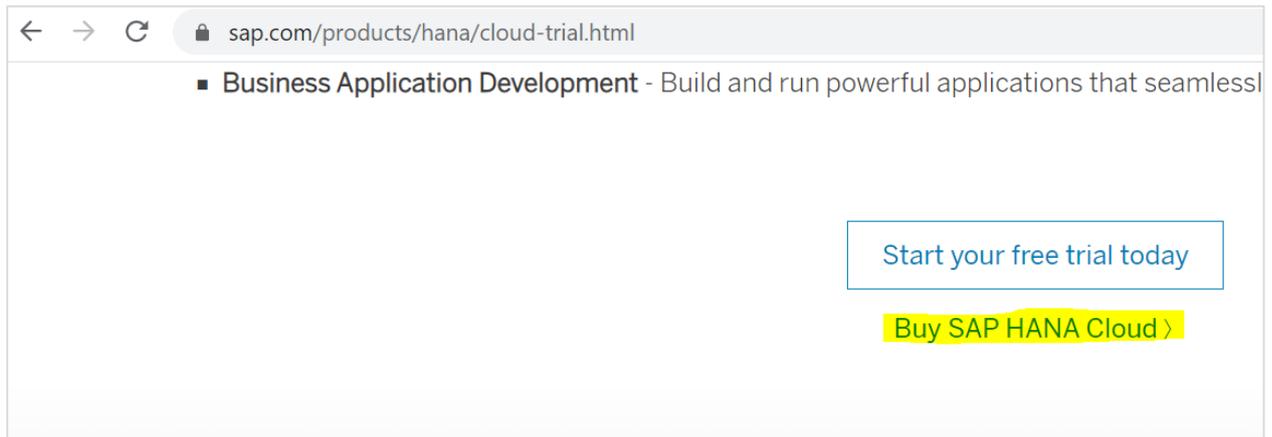
Trial account is usually recommended for personal use and exploration of features and not for Production or team use. Use of platform resources and services are restricted in Trial account and you can explore basic features of SAP BTP platform. Following are key features related to HANA Cloud Trial account:

- SAP offer BTP trial accounts in multiple regions. When you login to Trial account, it shows you the region in which the account is created.
- Using trial account allows you to create directories as per need

- Trial also allows you to use both productive and beta services.
- It is also possible to manage members in BTP trial platform
- SAP provides 4GB of memory in Trial account to explore Application development and 8GB of instance memory
- You can use 2 configured on-premise systems with the Cloud connector.
- In Trial account, SAP doesn't provide SLA's regarding availability of Cloud platform as it is recommended only for personal use.
- In HANA Cloud, application stop automatically on daily basis to manage the performance and you need to restart the application manually.

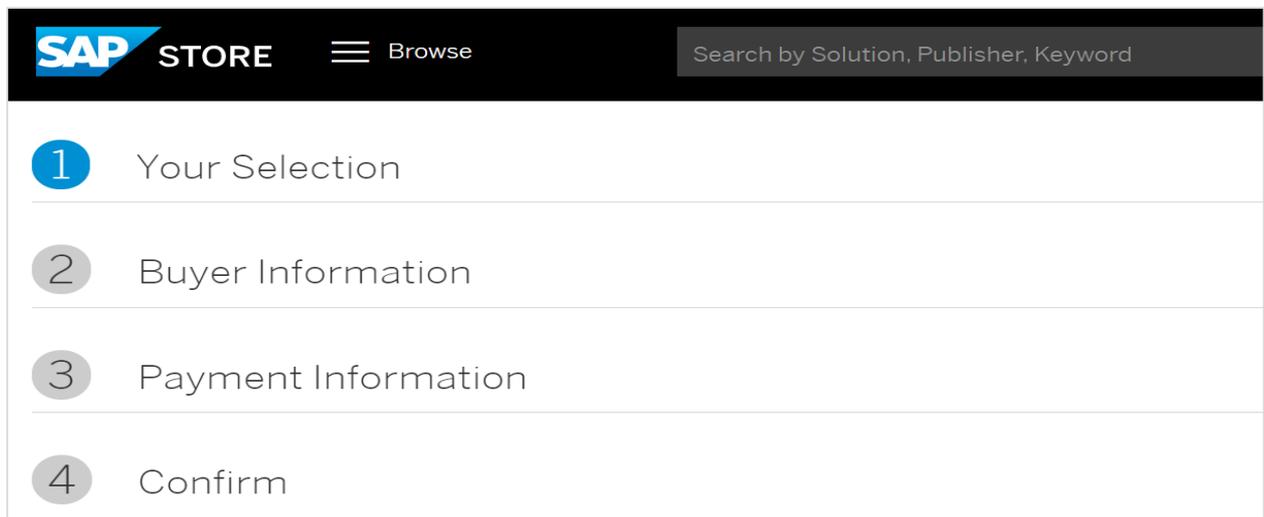
6. SAP HANA Cloud — Price Detail

Navigate to this URL-> <https://www.sap.com/products/hana/cloud-trial.html> → Scroll down and select Buy SAP HANA Cloud.



There are 4 steps to buy an Enterprise edition of SAP HANA Cloud.

- Your Selection
- Buyer Information
- Payment Information
- Confirm



To make the selection, enter the Product name as below and Search. This will load all the matching options available in SAP Store. Select SAP HANA Cloud and provide the necessary details as requested and this will enable your enterprise HANA Cloud account.

The screenshot shows the SAP Store interface. At the top, there is a navigation bar with the SAP logo, 'Store', a 'Browse' menu icon, and a search bar containing 'SAP HANA Cloud'. Below the search bar are filter options: 'Category', 'Industry', 'Works With', and 'More Filters'. The main content area displays '1743 Results for "SAP HANA Cloud"'. Two product cards are visible. The first card is for 'SAP HANA Cloud', featuring a gear icon, the text 'SAP HANA Cloud', a description 'The power and performance of SAP HANA with the scale and elasticity of the cloud', and a 'SAP Product' label with a heart icon. The second card is for 'Production Analytics Industry', featuring a bar chart icon, the text 'Production Analytics Industry', and a description 'Delivers rapid go-to market in Dashboard leveraging An'.

7. SAP HANA Cloud — Integration with Other apps

SAP HANA cloud platform as a Service provides an easy way to integrate your existing SAP and non-SAP applications to your business landscape. There are different scenarios which can be used to integrate HANA Cloud platform with On-premise and Cloud apps.

Few common scenarios are below:

SAP Cloud platform Cloud Connector

This is used for point to point connectivity of an on-premise system with Cloud application without any intermediate setup. Used when you need to replicate the data from an Database hosted on premise to HANA Database running on Cloud platform.

HANA cloud integration (HCI)

HCI is platform as a service software which allows developers to integrate Cloud application into existing landscape. It is usually recommended when you need to connect multiple independent systems/applications. You can connect-

1. Cloud to Cloud
2. Cloud to On-premise
3. On-premise to On-premise
4. Hybrid model

SAP Cloud platform Identity Authentication

This is used commonly in B2B, B2C scenarios where you provide users with functionality to manage self-services features like- self-registration, password forgot feature, user profile functions (change password, mobile device activation, activation of user account), etc.

SAP Cloud platform OData Provisioning

This is used to connect and expose Business system data using OData channel. A simple UI application which is used for user engagement and fetches the data from backend system.

8. SAP HANA Cloud — Connector (HCC)

To connect your HANA Cloud platform with an on-premise system, you can install HANA Cloud connector and configure it to communicate with HANA Cloud platform. HANA Cloud Connector is required for accessing on-premise NetWeaver Gateway and to develop a custom application using IDE. To use HANA Cloud Connector with SAP HANA Cloud platform, you must have HANA Cloud account.

Installing HANA cloud Connector:

You can download HANA Cloud connector HCC v2.9 or higher from this link: <https://tools.hana.ondemand.com/#cloud>.

Cloud Connector				
The Cloud Connector is an optional on-premise component that is needed to integrate on-demand applications with customer backend services and is the counterpart of SAP Connectivity service. For more information, see the Cloud Connector documentation .				
Note: The Portable archives for Cloud Connector are meant for non-productive scenarios only. They can be used even if you don't have administrator permissions on the machine, on which you like to use the Cloud Connector. However, those variants do not support upgrades from previous versions.				
Available Cloud Connectors				
Operating System*	Architecture	Version	File Size	Download
Linux	ppc64le	2.13.1	71.9 MB	sapcc-2.13.1-linux-ppc64le.zip (sha1)
Linux	x86_64	2.13.1	70.2 MB	sapcc-2.13.1-linux-x64.zip (sha1)
Linux (Portable)	ppc64le	2.13.1	74.9 MB	sapcc-2.13.1-linux-ppc64le.tar.gz (sha1)
Linux (Portable)	x86_64	2.13.1	72.6 MB	sapcc-2.13.1-linux-x64.tar.gz (sha1)
Mac OS X (Portable)	x86_64	2.13.1	72.5 MB	sapcc-2.13.1-macosx-x64.tar.gz (sha1)
Windows	x86_64	2.13.1	74.1 MB	sapcc-2.13.1-windows-x64.msi (sha1)
Windows (Portable)	x86_64	2.13.1	71.9 MB	sapcc-2.13.1-windows-x64.zip (sha1)

*Read the [prerequisites](#) page of the documentation in order to inform yourself about the supported operating system versions and JVMs.

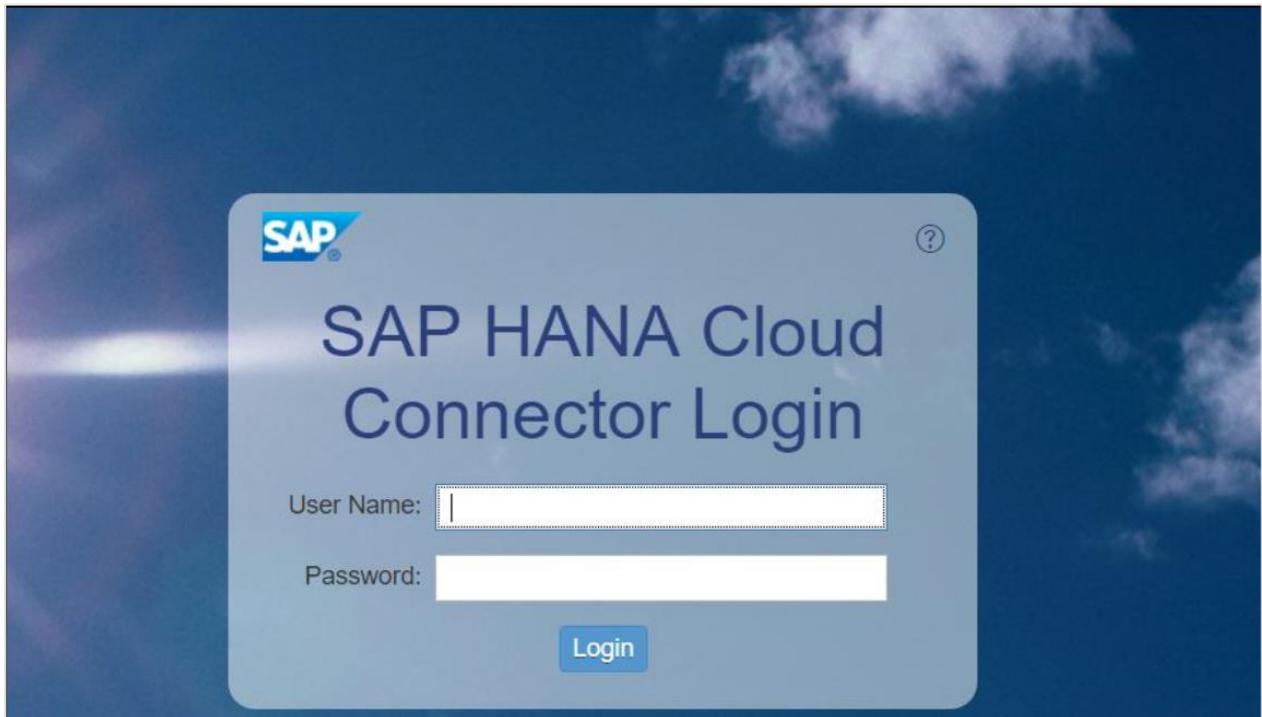
As prerequisite you should have JAVA JDK installed on your VM/on-premise system or you can also install SAP JDK8. By default, it uses port 8443 and proceed with installation steps.

Once HCC is installed, you have to start the Connector service by navigating to Services.msc on your system.

 Routing and Remote Access	Offers routi...	Disabled	Local System
 RPC Endpoint Mapper	Resolves RP...	Running	Network S...
 SAP HANA Cloud Connector 2.0	Hosts and c...	Running	Local System
 Secondary Logon	Enables star...	Manual	Local System

To access HANA Cloud Connector Administrator, navigate to this URL- <https://localhost:8443>.

- Default username - administrator
- Default Password - manage

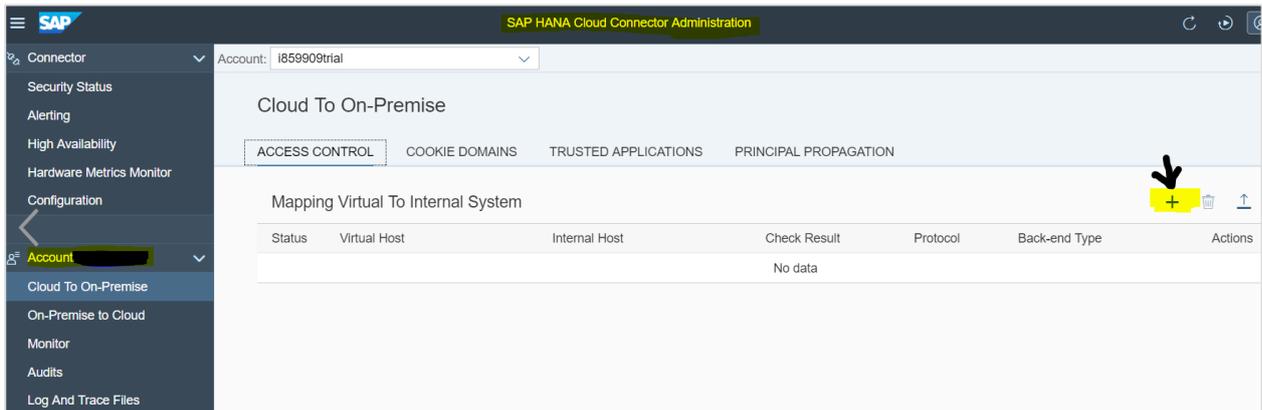


On SAP HANA cloud Administrator page, you need to provide details of your Cloud platform landscape. Below information is required:

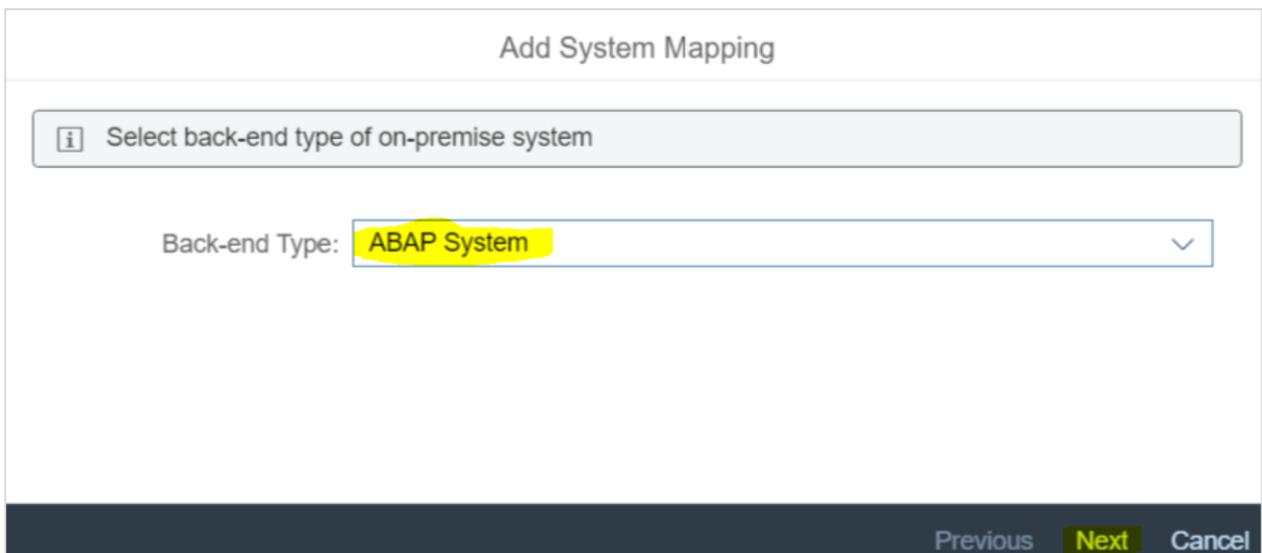
- Landscape: From the dropdown list, choose hanatrial.ondemand.com
- Account Name: Provide "User ID" including trial
- Display Name: same as the Account Name
- Account User: Provide Cloud "User ID" without trial
- Provide the password for HANA Cloud platform to complete connection
- HTTPS Proxy: Landscape require proxy details to access the internet, provide the details as requested

9. SAP HANA Cloud — Connecting an On-premise NW system

You can configure your HANA Cloud connector to connect to your on-premise NetWeaver Gateway system. Once you install HANA Cloud Connector, navigate to Administrator page and click on Cloud to On-premise option in left side menu.



To add an On-premise gateway, click on "+" icon as shown and this will open a new window to provide details of your NetWeaver Gateway system → Next.



In next step, you need to provide Protocol for communication with on-premise system:

Add System Mapping

i Select protocol for communication with on-premise system

Protocol: HTTP

Previous Next Cancel

In next step, you need to provide NetWeaver Gateway system details and Port# → Next. You have to provide Host name for your Virtual server however Port number remains same. Virtual Host name can be anything that is used to identify the system in HCC configuration.

Add System Mapping

i Enter internal (on-premise) host and port

*Internal Host: [REDACTED]

*Internal Port: 8001

Previous Next Cancel

Add System Mapping

i Optionally enter virtual names (used on cloud-side)

Virtual Host:

Virtual Port:

Previous Next

Provide Principal Type, you can keep it as default if you are using HTTP communication, pass the description in Next window → Next.

Add System Mapping

i Select principal type

Principal Type:

Add System Mapping

i Optionally enter a description

Description:

Previous **Next** Cancel

To test the connection, click on check box "Check Internal Host" and click on finish button to complete the connection. You can also add Resources Accessible on NetWeaver Gateway system by clicking on "+" icon.

Resources Accessible On [REDACTED]				
Enabled	Status	URL Path	Access Policy	Actions
No data				

Provide a forward slash (/) in URL Path option → Select the checkbox "Path and sub-paths" → Save.

Add Resource

*URL Path:

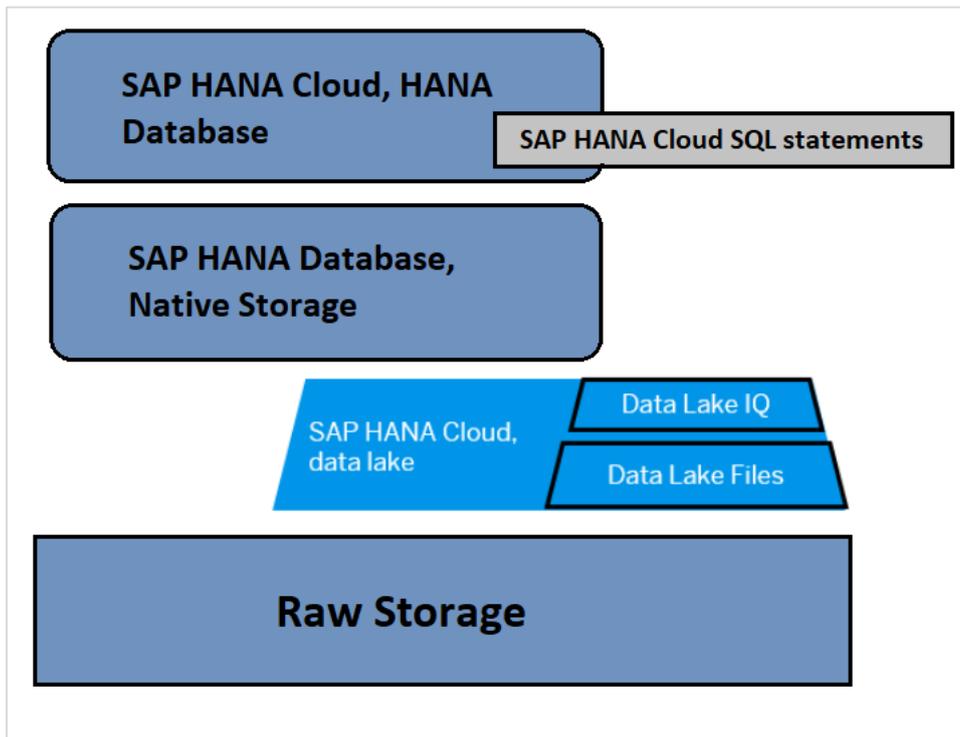
Enabled:

Access Policy: Path only (sub-paths are excluded)
 Path and all sub-paths

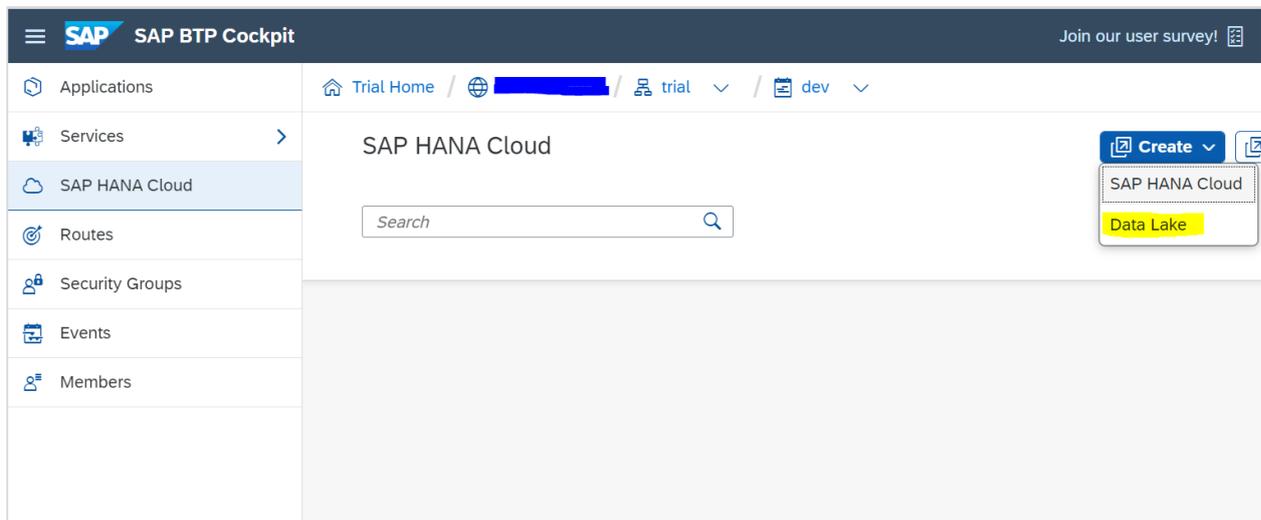
Description:

10. SAP HANA Cloud — Data Lake

Data lake is one of fully integrated key component of SAP HANA Cloud platform, which stores all structured, unstructured data files and shares common security and tools as HANA Cloud. Data lake IQ component provides the high-performance SQL analysis on large volume of data stored in Data lake.



HANA Cloud data lake is usually managed and queried using SAP HANA Cloud SQL statements and data lake SQL statements. When you create a data lake instance, several things occur automatically.



Create Instance

1 General

Location

Choose the organization and space of your data lake instance. The memory size of your instance depends on the space.

Organization:* ▼

Space:* ▼

The selected space does not support provisioning data lake instances.

Basics

Provide a name and description for your instance.

Instance Name:* ⓘ

Description:

30 characters remaining

When you create Data lake, it automatically provisions the below:

This creates a container in data lake called "SYSRDL#CG". It also creates a schema with the same name as the container is created. The container is managed and owned by schema and it resides all tables, views and indexes.

In HANA Cloud instance, a remote source named "SYSRDL#CG_SOURCE" also exists which is used to connect the instance to data lake. All query and data management in data lake is performed via SAP HANA Cloud platform.

To create a Data lake, you can either choose to create the data lake with instance creation or you can do after the instance is created. To enable data lake after your instance is provisioned, navigate to Manage HANA Cloud option in SAP HANA Cloud cockpit.

Join our user survey! 📄 🔔 7 🗨️ 👤 ▼

/ 🏠 trial ▼ / 📁 dev ▼

🔗 Create ▼ 🔗 Manage SAP HANA Cloud

Click on 3 dots (...) on HANA Database instance and this will open side menu → Add Data Lake. Provide the Instance Name and description of your data lake. If you are using Trial account, you won't be able to modify the Data Lake values for Storage, vCPU's → Save.

Create a Data Lake instance for [Instance Name]

Instance Credentials

Organization: * [Organization Name]

Space: * Learning

Instance Name: *

Description:

40 characters remaining

Data Lake

Compute: vCPUs Min 4 vCPUs, Max 162 vCPUs

Storage: TB Min 1 TB, Max 90 TB

Coordinators: 1 x 2 vCPUs

Workers: 1 x 2 vCPUs

[Data Lake Documentation](#)

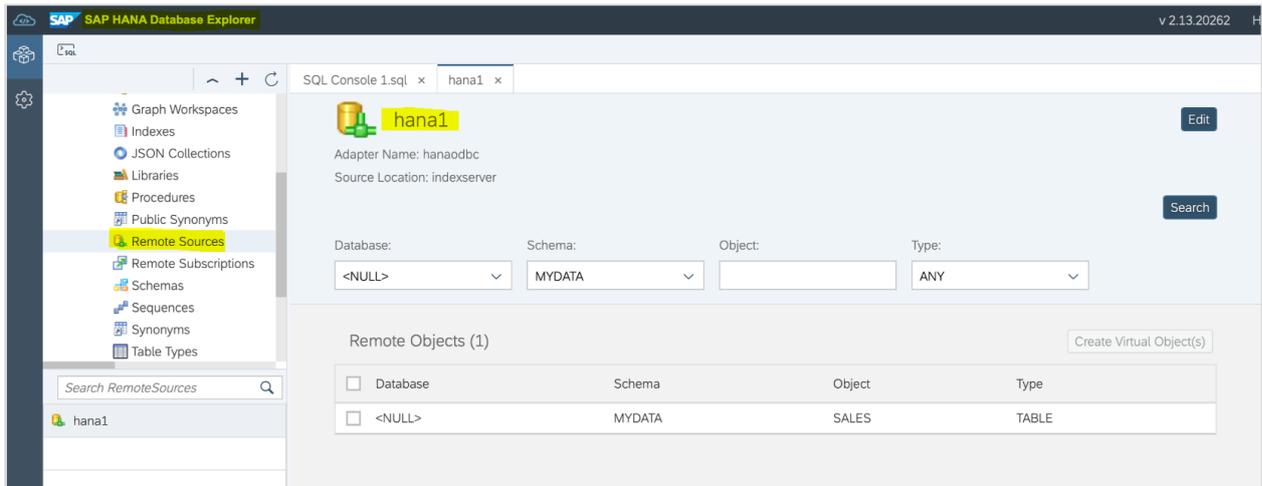
[Data Lake Sizing Calculator](#)

Save Cancel

You can create tables, views, access the data reside on HANA Cloud data lake using Database Explorer option as mentioned. Navigate to Instance associated with specific data lake that you want to explore and click on "Action" button.

The screenshot shows the SAP Cloud Platform Cockpit interface. On the left is a navigation menu with options like Applications, Services, and SAP HANA Cloud. The main area displays 'SAP HANA Cloud' with a search bar and buttons for 'Create Database' and 'Manage HA'. Below this, there are two sections: 'SAP HANA Instances' and 'Data Lake Instances'. In the 'SAP HANA Instances' section, the 'DemoHC20-hana' instance is highlighted in yellow. Its 'Actions' dropdown menu is open, showing options: 'Monitor landscape', 'Administer DemoHC20-hana', and 'Execute SQL and explore objects'. The 'Data Lake Instances' section shows two instances: 'BestRunDL' and 'DemoHC20-rdl', each with its own 'Actions' dropdown.

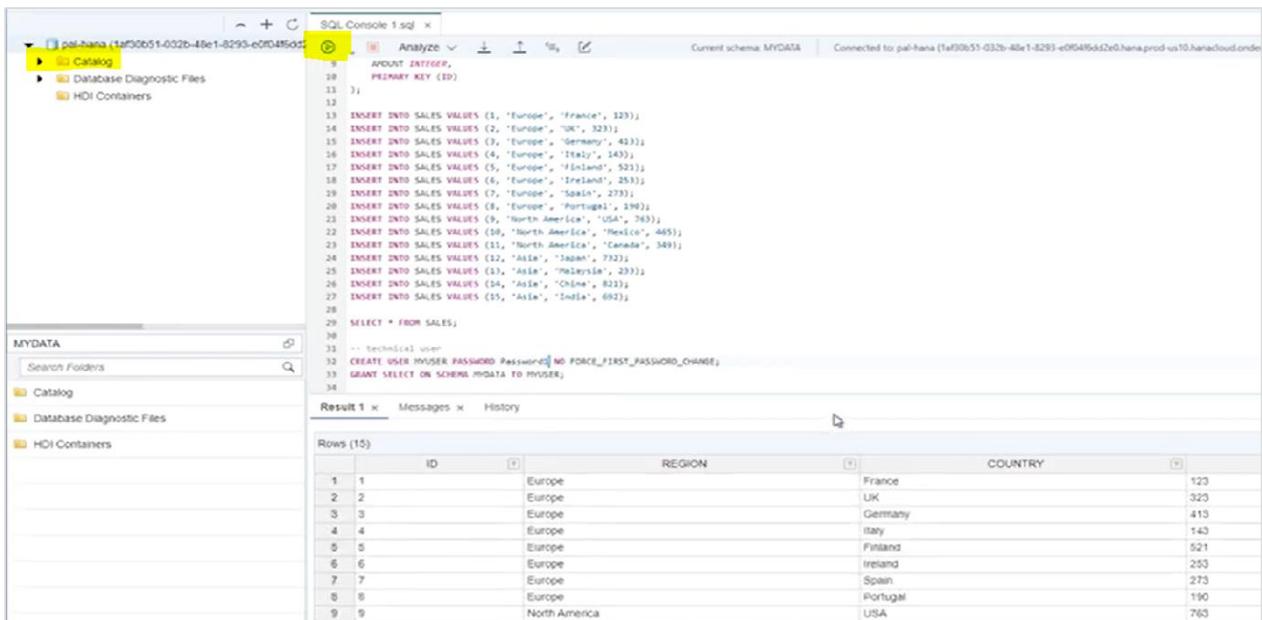
This will open a new tab to run SQL queries known as "Database Explorer" → Using this you can create new tables, access data in HANA Cloud data lake. To view the tables created in Data lake, right-click on "Remote Sources" option under the Catalog option of the Database instance.



You can also create Remote Source using SQL query as below by setting an ODBC connection to HANA database:

```
CREATE REMOTE SOURCE "hanateat" ADAPTER hanaodbc
CONFIGURATION
'Driver=libodbcHDB.so;ServerNode=<endpoint>;dm1_mode=readonly;encrypt=true;'
WITH CREDENTIAL TYPE 'PASSWORD'
USING 'user=<username>;password=<password>'
```

To run the query, click on Green button on top of SQL console.



How to Execute a data lake SQL statement in Data lake IQ (HANA DB-managed): You can connect to SAP HANA database, and use the REMOTE_EXECUTE procedure as below:

While using REMOTE_EXECUTE procedure, SQL query must be enclosed with single quotes. Below shows SQL query to create Table and View in Data Lake:

This statement creates table "Test_tbl".

```
CALL SYSRDL#CG.REMOTE_EXECUTE ('  
    CREATE TABLE Test_tbl (X INT, Y INT)  
' );
```

This statement creates the data lake view VIEW_TEST.

```
CALL SYSRDL#CG.REMOTE_EXECUTE ('  
    CREATE VIEW VIEW_TEST AS SELECT * FROM Test_tbl  
' );
```

11. SAP HANA Cloud — Data Lake Components

SAP HANA Cloud Data lake consists of two key components:

- Data Lake IQ
- Data Lake Files

Data Lake IQ

Data Lake IQ is used to store and analyze huge amount of structured data. It is cost effective solution to maintain high performance efficient SQL access to data. When you provision a data lake in HANA DB instance, it by default enables Data Lake IQ with that.

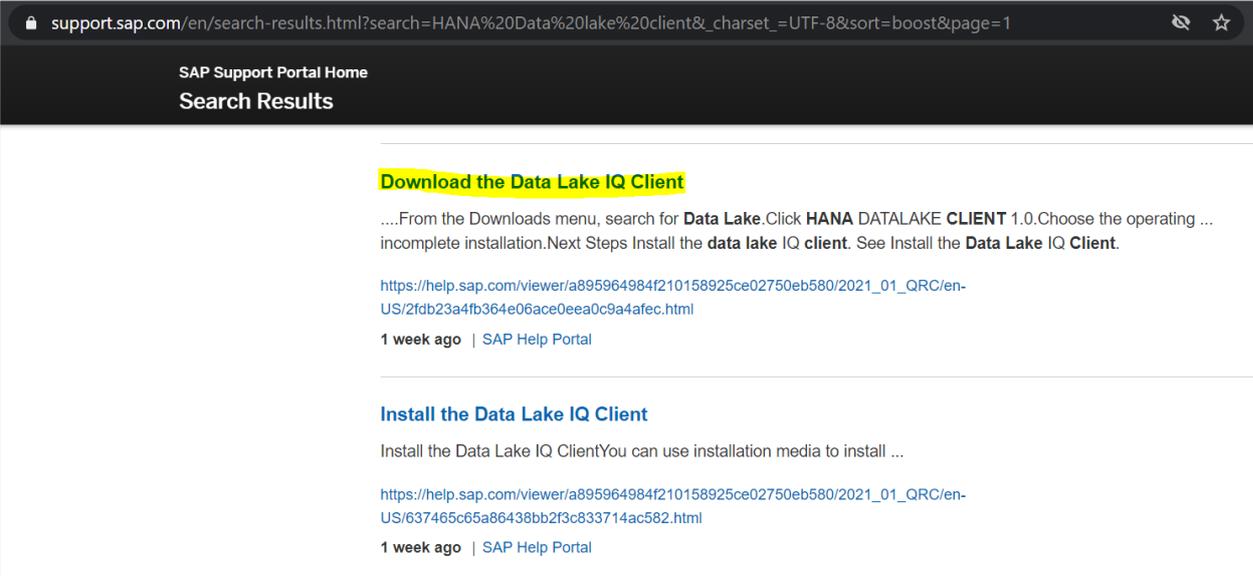
You can make a direct connection to Data Lake IQ using any of client tool:

- SAP HANA Database Explorer
- Interactive IQ Client
- Isql client

To connect to Data Lake IQ, you can use any of mentioned IQ clients enabling data lake IQ component. These prerequisites should be met- The data lake instance has been created and IP address is allowed to access the data lake IQ.

Data Lake IQ Client

To download IQ Client, navigate to SAP Software site- <https://support.sap.com/en/my-support/software-downloads.html> and search for Data Lake Client.



The screenshot shows a search results page on the SAP Support Portal. The search query is "HANA%20Data%20lake%20client&_charset_=UTF-8&sort=boost&page=1". The results are displayed under the heading "SAP Support Portal Home Search Results". There are two search results listed:

- Download the Data Lake IQ Client**
...From the Downloads menu, search for **Data Lake**. Click **HANA DATALAKE CLIENT 1.0**. Choose the operating ... incomplete installation. Next Steps Install the **data lake IQ client**. See Install the **Data Lake IQ Client**.
https://help.sap.com/viewer/a895964984f210158925ce02750eb580/2021_01_QRC/en-US/2fdb23a4fb364e06ace0eea0c9a4afec.html
1 week ago | SAP Help Portal
- Install the Data Lake IQ Client**
Install the Data Lake IQ Client You can use installation media to install ...
https://help.sap.com/viewer/a895964984f210158925ce02750eb580/2021_01_QRC/en-US/637465c65a86438bb2f3c833714ac582.html
1 week ago | SAP Help Portal

Select "HANA DATALAKE CLIENT 1.0" → Select OS from the dropdown list and click the zip file to download. To connect to Data Lake, follow the steps.

Click on Interactive SQL icon → select the Data base type “Data Lake IQ” and provide your username- “HDLADMIN” and password which you provided while creating Data Lake instance.



Pass the instance details of Data Lake and provide in Connection parameters → Connect.

Using isql client

You can also use isql commands to send them to the Data Lake instance. The results are printed on standard output. Below are commonly used isql commands for different functions:

:r <filename>

This command is used to read an OS file into the command buffer.

:R <filename>

This command is used to read an OS file into the command buffer then shows the command.

use <database_name>

It changes the current database.

!! <os_command>

It executes an operating system command. Place at the start of a line.

<file_name>

It redirects the output of the Transact-SQL command to <file_name>. This example inserts the instance version into <file_name>:

```
select @@version
go > <file_name>
```

>> <file_name>

This command appends the output of the Transact-SQL command to <file_name>. This example appends the instance version to <file_name>:

```
select @@version
go >> <file_name>
```

| command

It pipes the output of the Transact-SQL command to an external command. This example finds all instances of “sa” in the listing produced by sp_who:

```
sp_who
go | grep sa
```

vi (UNIX) or edit (Windows)

This command calls the default editor.

Reset

It clears the query buffer.

Quit or exit

It exits isql.

Data Lake Files

Data Lake files are stored in Data Lake containers also called as “Object Store” and used to provide manage access to structured, semi structured and unstructured data. Data Lake Files object store has below key features:

File store for structured, semi-structured and unstructured files:

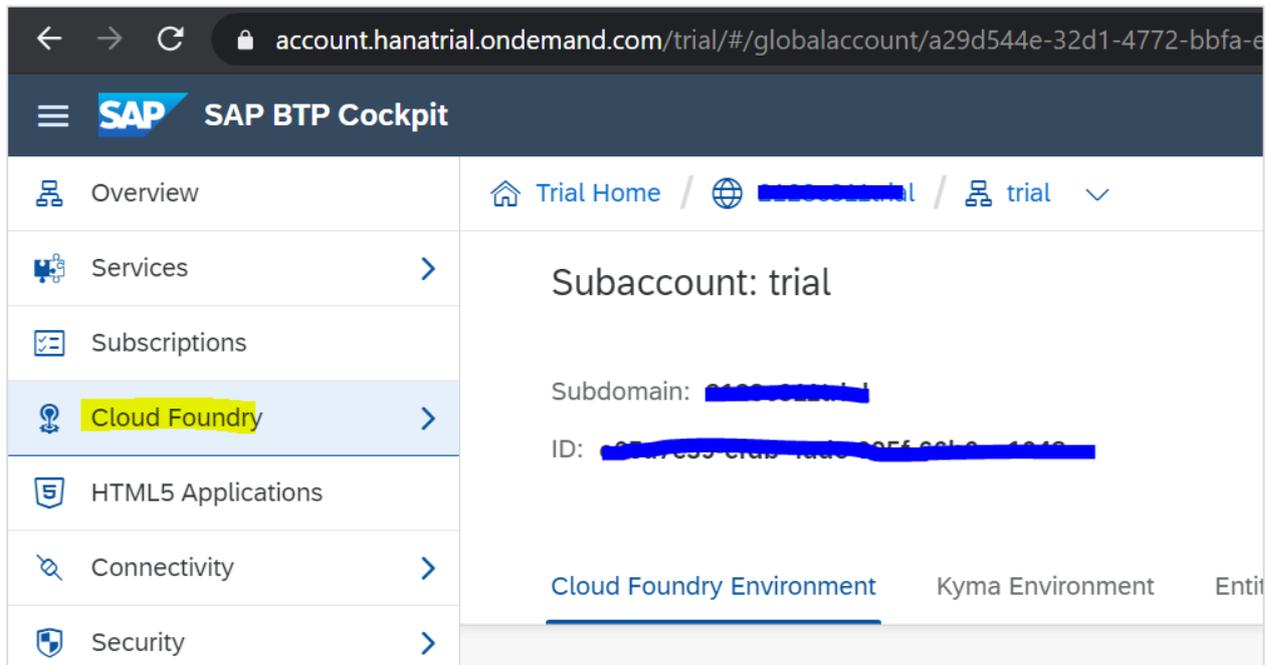
You can use Load table statement to query the store object files without need of loading them in Data Lake IQ. When you provision a Data Lake instance, Files container is also provisioned that time without any additional cost and you just need to pay storage cost for the files stored in Object Store.

Location for auditing files and diagnostic logs

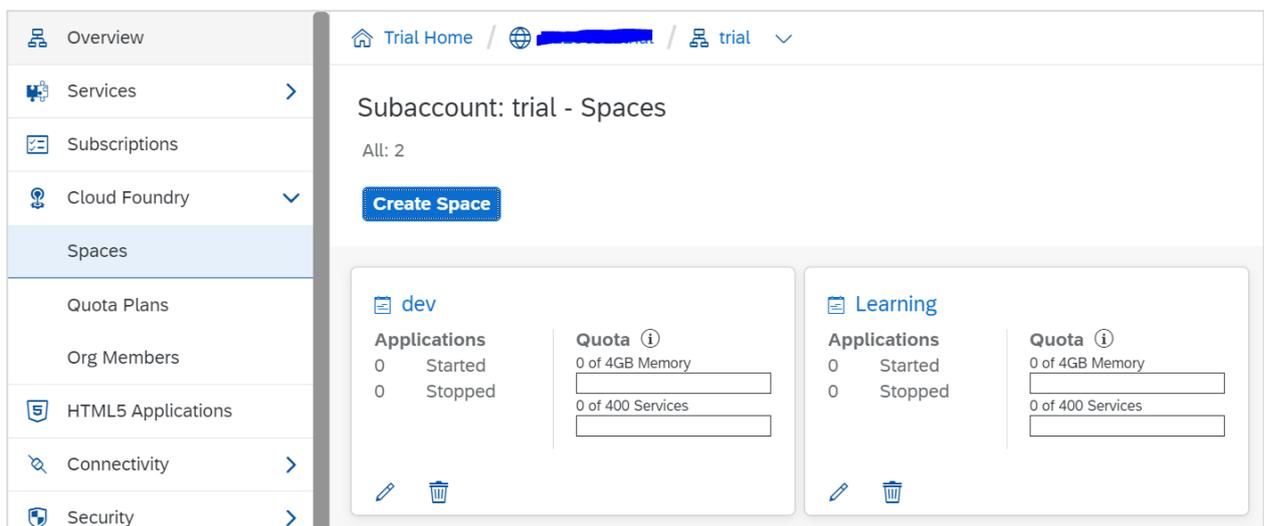
The data lake Files container is the repository where data lake IQ stores auditing files and diagnostic logs. This storage isn't optional – data lake IQ always uses the data lake Files container for auditing and diagnostic files.

12. SAP HANA Cloud — Connect to HANA Cockpit

You can connect to HANA Cockpit using SAP BTP cockpit. Login to SAP BTP account and click on subaccount -> Trial and navigate to Cloud Foundry.



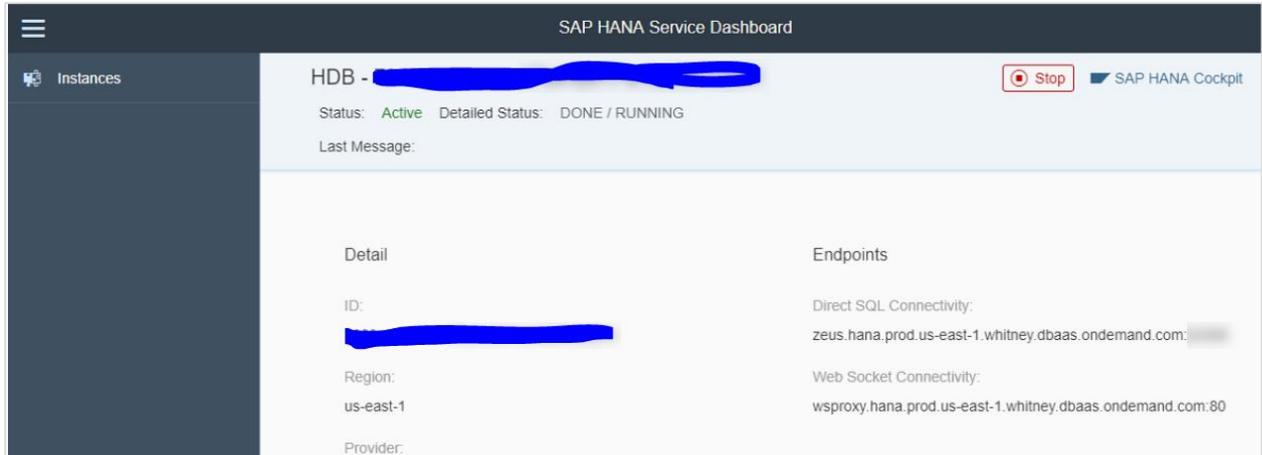
Go to Spaces under Cloud Foundry → select Dev space.



Once you click on Dev space → Service Instances (You should have an existing HANA Database instance) and click on Open Dashboard button icon under Actions and click on Authorize to allow access to HANA Cockpit access.

Name	Plan	Last Operation	Actions
HDB	enterprise	Created	

This will open SAP HANA service BTP dashboard and you can also see SAP HANA Cockpit option and HDB instance ID at the top.



SAP HANA Service Dashboard

HDB - [REDACTED] Stop 

Status: Active Detailed Status: DONE / RUNNING

Last Message:

Detail

ID: [REDACTED]

Region: us-east-1

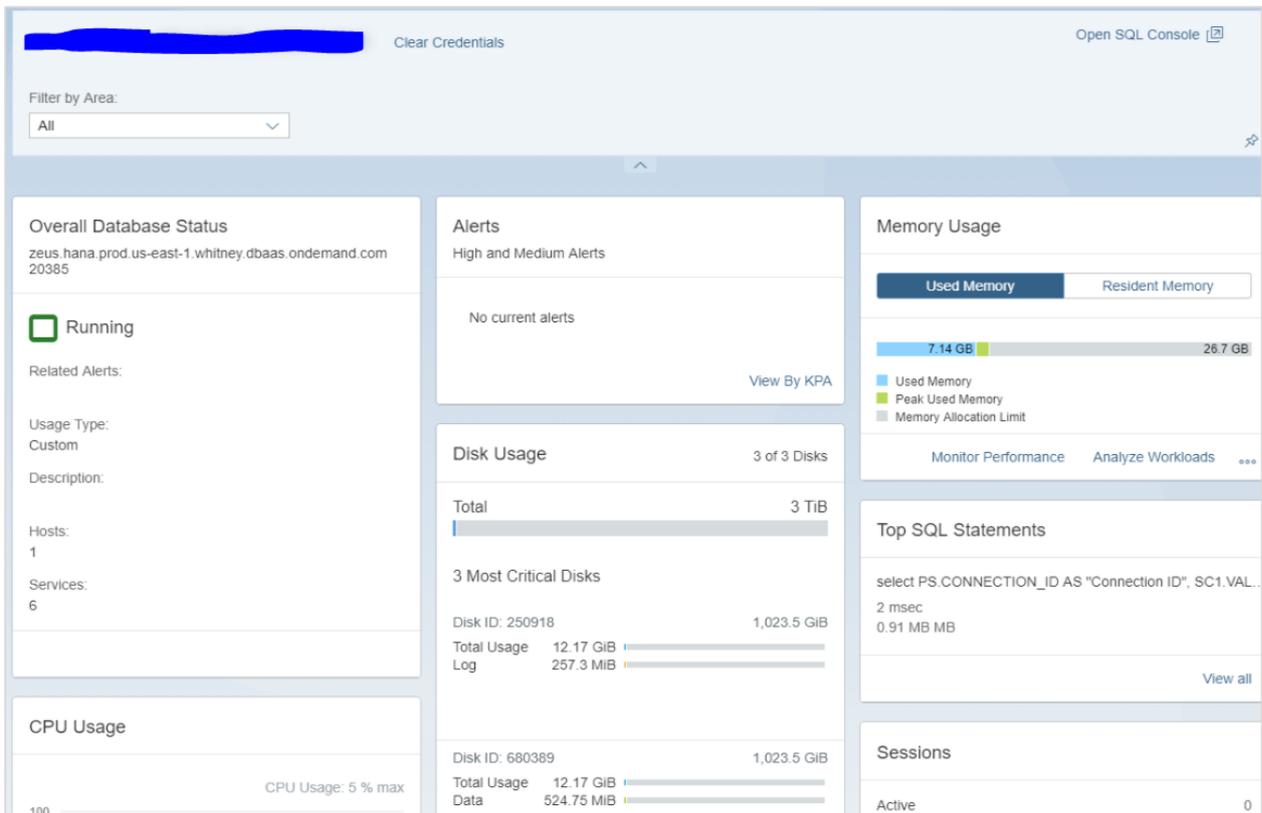
Provider:

Endpoints

Direct SQL Connectivity: zeus.hana.prod.us-east-1.whitney.dbaas.ondemand.com: [REDACTED]

Web Socket Connectivity: wsproxy.hana.prod.us-east-1.whitney.dbaas.ondemand.com:80

Click on SAP HANA Cockpit icon at the right top and provide user name & password to login to HANA Cockpit → OK.



[REDACTED] Clear Credentials Open SQL Console

Filter by Area: All

Overall Database Status
zeus.hana.prod.us-east-1.whitney.dbaas.ondemand.com
20385

Running

Related Alerts:

Usage Type: Custom

Description:

Hosts: 1

Services: 6

Alerts
High and Medium Alerts

No current alerts

[View By KPA](#)

Memory Usage

Used Memory Resident Memory

7.14 GB 26.7 GB

Legend: Used Memory (Blue), Peak Used Memory (Green), Memory Allocation Limit (Grey)

[Monitor Performance](#) [Analyze Workloads](#) ...

Disk Usage 3 of 3 Disks

Total 3 TiB

3 Most Critical Disks

Disk ID: 250918 1,023.5 GiB

Total Usage 12.17 GiB

Log 257.3 MiB

Disk ID: 680389 1,023.5 GiB

Total Usage 12.17 GiB

Data 524.75 MiB

Top SQL Statements

select PS.CONNECTION_ID AS "Connection ID", SC1.VAL...

2 msec

0.91 MB MB

[View all](#)

CPU Usage

CPU Usage: 5 % max

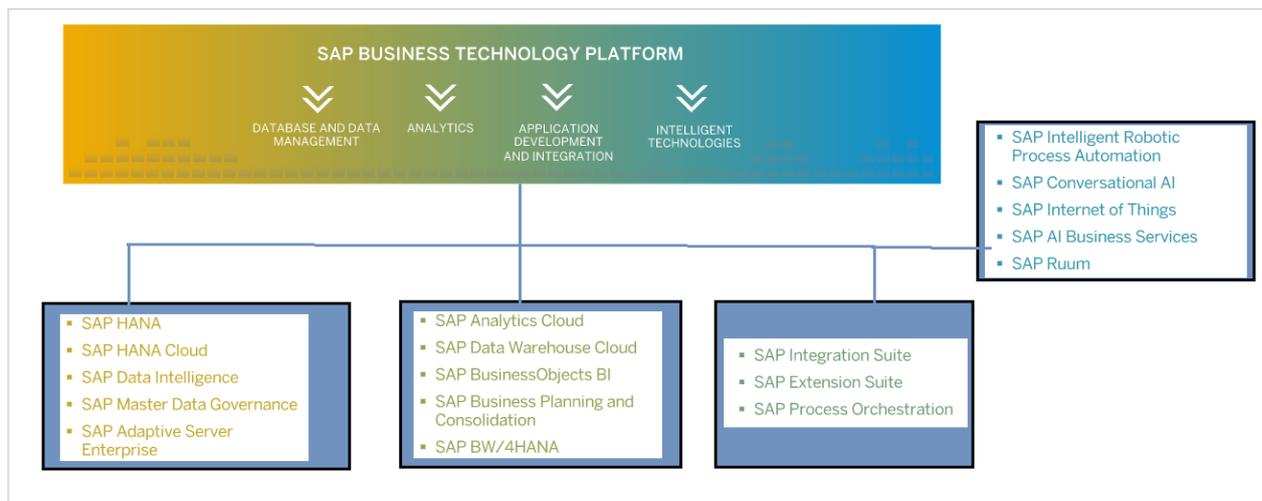
Sessions

Active 0

13. SAP HANA Cloud — SAP BTP service

SAP Business Technology platform (BTP) is an integrated platform for business where they can integrate, extend data to value from all different multiple hosted applications and with ability to perform database management, app development and analytics capability at one place. SAP HANA Cloud platform is part of SAP BTP cockpit service only.

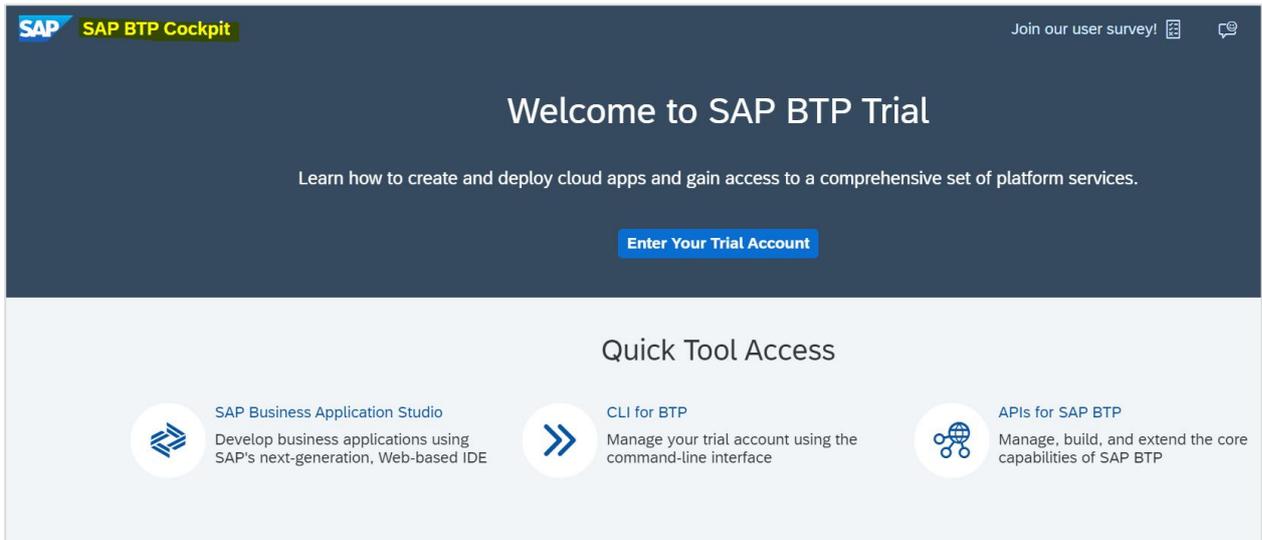
SAP provides Business Technology Platform BTP as portfolio of integrated services to derive value from SAP and non-SAP applications by fetching most critical data and transforming into business value.



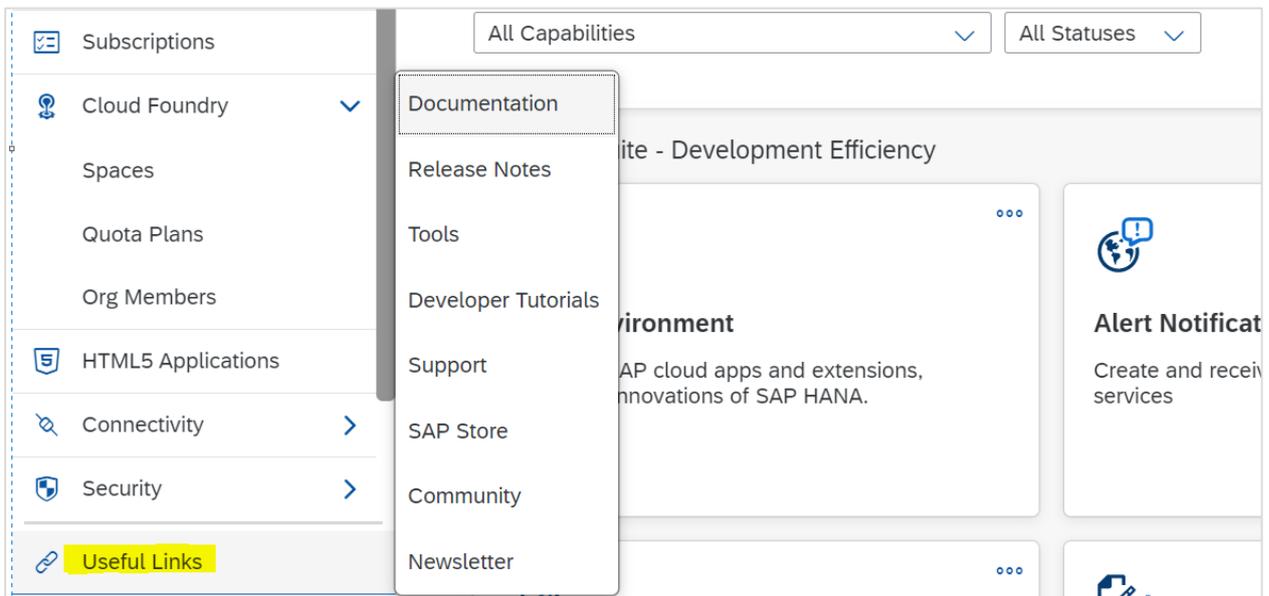
You can access SAP BTP trial from this link - <https://www.sap.com/cmp/td/sap-cloud-platform-trial.html> and explore the key features:

Key services evaluation of SAP Business Technology Platform (BTP).

- BTP platform for developing and deploying your first cloud application
- Leveraging BTP platform for creating interactive UI's and apps using guided tutorial from SAP



To view all the available documentation, Release notes, Tools, Support, SAP store, etc., you can navigate to Useful links option on left bottom in your trial subscription.



To view list of all services available via BTP platform, navigate to Services -> Service Market Place. To access HANA Cloud platform, search for SAP HANA Cloud and click on create on "..." button to create an Instance.

The screenshot shows the SAP Service Marketplace interface. On the left is a navigation menu with items: Overview, Services, Service Marketplace (highlighted), Instances and Subscriptions, Subscriptions, Cloud Foundry, Spaces, Quota Plans, Org Members, HTML5 Applications, Connectivity, Security, Useful Links, and Legal Information. The main content area is titled 'Subaccount: trial - Service Marketplace' and shows 'All: 63' services. There are search and filter controls: a search bar with 'Search' placeholder, 'All Types', 'All Environments', 'All Capabilities', and 'All Statuses' dropdowns. Below this is a section titled 'Extension Suite - Development Efficiency' containing four service cards: 'ABAP environment' (develop ABAP cloud apps), 'Alert Notification' (real-time alerts), and two partially visible cards at the bottom.

This screenshot shows the search results for 'HANA Cloud' in the SAP Service Marketplace. The title is 'Subaccount: trial - Service Marketplace' and it indicates 'Filtered: 1 of 63' results. The search bar contains 'HANA Cloud' and is accompanied by 'All Types', 'All Environments', 'All Capabilities', and 'All Statuses' dropdown filters.

This screenshot shows a single service card for 'SAP HANA Cloud' under the 'Extension Suite - Development Efficiency' category. The card features a cloud and cylinder icon, the title 'SAP HANA Cloud', and a description: 'Leverage the in-memory data processing capabilities of SAP HANA in the cloud as one...'. A three-dot menu icon is visible in the top right corner of the card.

14. SAP HANA Cloud — Binding Applications

After creating SAP HANA Cloud instance in Foundry space, you can bind an application using BTP cockpit. Applications are usually bind to HANA cloud platform using a schema or HDI container. You can assign a schema or HDI container to an application by assigning service plan to your database.

To setup a schema or HDI container, you need to navigate to HANA Cloud platform → Cloud Foundry Space → Services → Service Marketplace.

Note: One of prerequisites of setting up schema or HDI container is that you have an enterprise account and have added schema or HDI-shared plan under Entitlements.

After navigating to Service Market Place, select SAP HANA Schemas & HDI Containers → Create Instance.

Service Marketplace

Filtered: 2 of 63

HDI All Types All Environments All Capabilities

All Statuses

Extension Suite - Development Efficiency

SAP HANA Schemas & HDI Containers
Manage schemas and HDI containers on an existing SAP HANA database.

SAP HANA Schemas & HDI Containers T...
Manage schemas and HDI containers on an existing SAP HANA database.

Next is to select the Service plan as shown from the list or HDI-shared service plan to create HDI Container → click on "... " → Create.

Extension Suite - Development Efficiency

SAP HANA Schemas & HDI Containers
Manage schemas and HDI contain...

SAP HANA Schemas & HDI Containers Trial
Manage schemas and HDI contain...

SERVICE PLANS

Choose a service plan to create an instance of this service.

Plan	Description	Environments	Active
hdi-shared	HDI container on a HANA database More	Cloud Foundry	<input type="button" value="..."/>
schema	Schema on a HANA database More	Cloud Foundry	<input type="button" value="..."/>
securestore	Schema on a HANA database More	Cloud Foundry	<input type="button" value="..."/>

Select the Plan, Space and provide the Instance Name → Next.

New Instance or Subscription

1 Basic Info

2 Parameters

3 Review

Enter basic info for your instance or subscription.

Service: *
SAP HANA Schemas & HDI Containers Trial

Plan: *
schema

Runtime Environment: *
Cloud Foundry

Space: *
dev

Instance Name: *
TESTDEV

Pass the parameters as per requirement → Next → Create. You will get a message, **Service instance creation is in progress**. You can view the instance and its current status on the Instances and Subscriptions page.

New Instance or Subscription

1 Basic Info 2 Parameters 3 Review

Review and verify the instance details.

TESTDEV

Service: SAP HANA Schemas & HDI Containers Trial
 Service Plan: schema
 Runtime Environment: Cloud Foundry
 Space: dev

Creating an instance might take a while.

< Back Create Cancel

To check the instance status, navigate to Instances and Subscriptions option under Services. Status tab shows the instance status if successfully created.

Subscriptions (1) Instances (1) Environments (1)

Service instances created in: [Cloud Foundry](#) | [Kyma/Kubernetes](#) | [Other environments](#)

Instance	Service	Plan	Runtime Env...	Scope	Credentials	Status
TESTDEV	SAP HANA S...	schema	Cloud Foundry	dev		Created

To bind your application to SAP HANA Cloud instance via SAP HANA Schemas & HDI Containers, Navigate to Cloud Foundry space → Applications and this will show you the list of all applications to which the selected application is currently bound.

Overview Services Subscriptions Cloud Foundry HTML5 Applications

Trial Home / [redacted] / trial

Subaccount: trial - HTML5 Applications

To display or run HTML5 applications, please subscribe to at least one of the following services:

- [SAP Launchpad](#) [Subscribe](#) | [Learn More](#)
- [SAP Portal](#) [Subscribe](#) | [Learn More](#)
- [SAP Work Zone](#) [Subscribe](#) | [Learn More](#)
- [SAP Work Zone for HR](#) [Subscribe](#) | [Learn More](#)

Select Service Bindings → Service Type tab, select the Service from the catalog radio button and choose Next → select SAP HANA Schemas & HDI Containers → Select Service Plan → Finish

After creating binding, you have to restart the application. Navigate to Cloud Foundry -> Applications and click on Stop.

 <p>TEST SAP Fiori</p>	<p>STOPPING</p>	<p>Created On 04/03/2021 7:27 PM</p>	<p>ID ws-zn8qg</p>	 
--	------------------------	--	------------------------	---

15. SAP HANA Cloud — Migration

There are various benefits that you can achieve if you migrate your existing applications to HANA Cloud platform. You have an option to scale your data storage requirement and pay only for storage and compute you need. With HANA cloud, you have an inbuilt HANA Cloud data lake and you can choose between multi cloud like Amazon and Azure services.

Before you plan migration to HANA Cloud platform, you need to perform assessment of HANA Cloud capabilities, define different steps and plan the migration tasks under each phase and effort required to perform the migration.

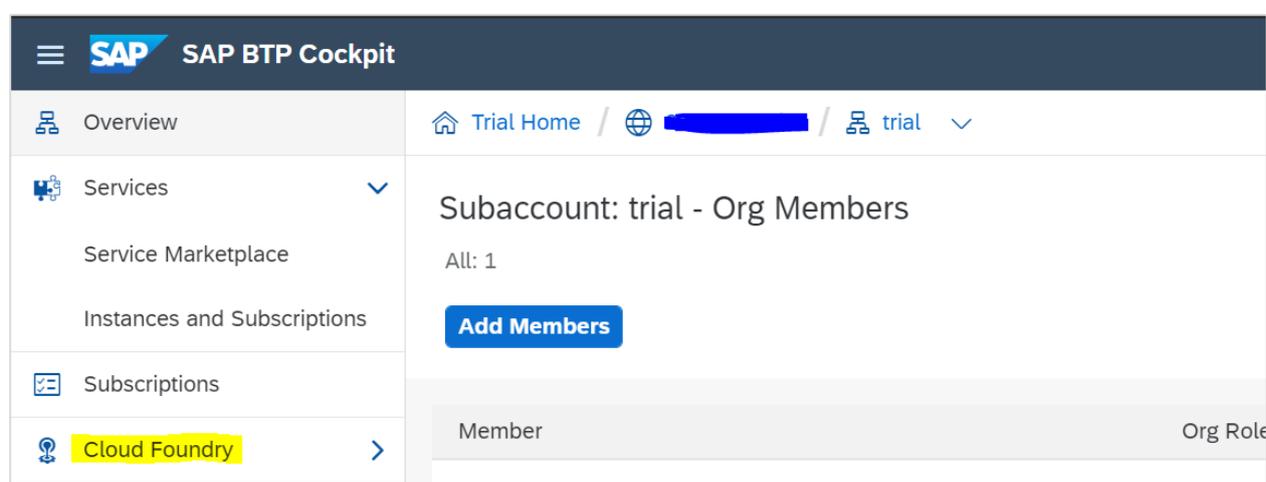
Migrate HANA Service Database to SAP HANA Cloud platform

Precheck includes creation of HANA Cloud database in same Cloud Foundry as HANA Service Database that you need to migrate. Access to HANA Service Database and Cloud tools to be enabled using SAP BTP cockpit.

You can migrate HANA database using migration wizard in BTP Cockpit.

Note: If you don't complete the migration within 60 days then it will be automatically archived.

To start with migration, navigate to SAP BTP cockpit → Cloud Foundry Space.



The screenshot shows the SAP BTP Cockpit interface. The top navigation bar includes the SAP logo and 'SAP BTP Cockpit'. The left sidebar contains a menu with 'Overview', 'Services', 'Subscriptions', and 'Cloud Foundry' (highlighted in yellow). The main content area displays 'Trial Home' with a globe icon and a dropdown menu for 'trial'. Below this, it shows 'Subaccount: trial - Org Members' with 'All: 1' and an 'Add Members' button. A table with columns 'Member' and 'Org Role' is partially visible at the bottom.

Navigate to SAP HANA Cloud migration → Select New Migration and provide the migration details → Create.

The screenshot shows the SAP HANA Cloud Applications page. The left sidebar contains navigation options: Applications, Services, SAP HANA Cloud, SAP HANA Cloud Migrations (highlighted in yellow), Portal, Routes, Security Groups, Events, and Members. The main content area is titled 'Space: Learning - Applications' and shows 'All: 3' services. A 'Deploy Application' button is visible. Below is a table with columns 'Requested State' and 'Name'.

Requested State	Name
Stopped	db
Started	FVwmXu93MIC0FIWf-MyCAP-srv
Started	hdispacedeploya0d06e5c-fb62-475f-a149-4fb27bb004cf

Enter the below information:

- **Name** - Provide the relevant migration name
- **Description** - Brief description of the migration
- **Source Type** - You have to select the type of service to migrate → select SAP HANA service database

Under Plan section, select the Source system details and perform the compatibility check by clicking "Check Compatibility with SAP HANA Cloud". Follow the steps as per Migration wizard and finish the migration.

16. SAP HANA Cloud — Self-service Tool

There is a Self-service tool from SAP which you can use to migrate HANA Database Service to HANA cloud platform. This tool performs the compatibility of HANA Database with SAP HANA Cloud platform and identifies which DB objects can be migrated directly and which needs configuration and migration to be handled manually.

To use Self Service tool, HANA service instance must be having HANA database revision 53 or later and it only supports migration for HANA database running in cloud Foundry hosted in Amazon Web Service. Self-Service tools can migrate Database schemas, DB objects, data stored in HANA DB. You can generate a report in Self-service tool which shows you all the objects which are migrated and features which cannot be automatically migrated and also provides details to make your implementation work in HANA Cloud platform.

Few common objects which cannot be migrated using Self-service Tool:

- Customize SQL statement
- Application scripts
- Other non-standard/advance Security configuration

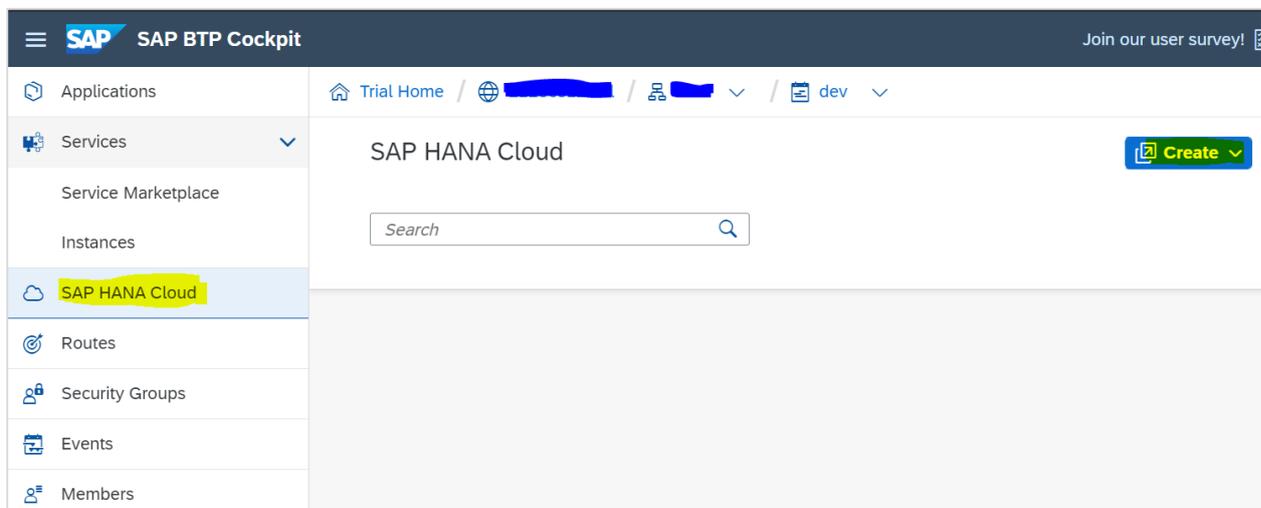
17. SAP HANA Cloud — Creating Instance

To create an instance of SAP HANA Cloud in Cloud Foundry, you have to ensure that subaccount is created in Global account and space exists in subaccount. Cloud Foundry support is also enabled inside subaccount.

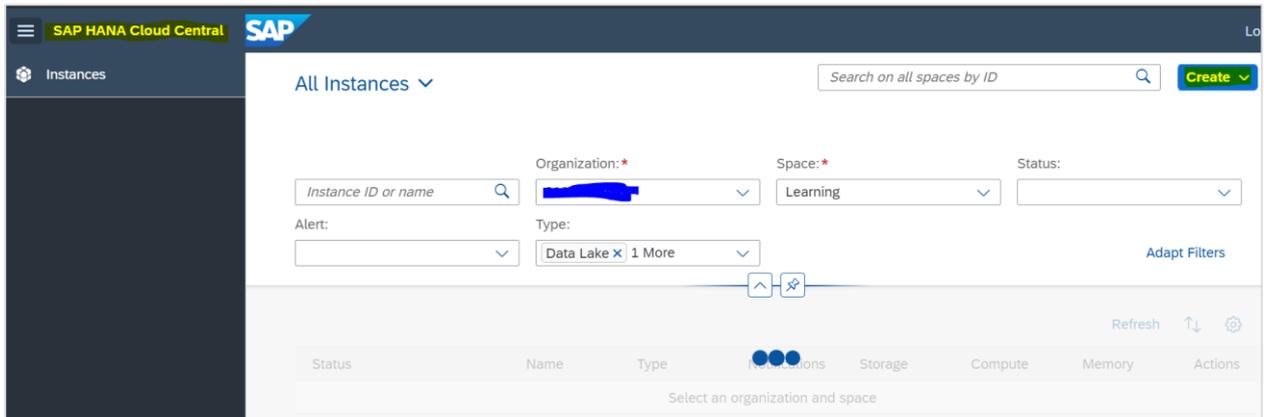
Following Service plan exists in Enterprise instance:

- **HANA** - To create SAP HANA database instance
- **Relational-data-lake** - To create SAP HANA Cloud, data lake instance
- **HANA-cloud-connection** - To create a connection between HANA DB and Data Lake instance
- **adaptive-server-enterprise** - To create SAP HANA Cloud Adaptive server Enterprise instance
- **adaptive-server-enterprise-replication** - To create SAP HANA Cloud Adaptive server Enterprise replication instance

To create HANA DB instance, navigate to SAP BTP cockpit → Cloud Foundry space → SAP HANA Cloud.



This will take you to SAP HANA Cloud Central page, Go to Create → From drop down Select SAP HANA Database to create an instance. You can select the Organization and Space where you want to create this instance.



In the next window, you need to provide instance details as below:

- **Organization** - This shows Cloud Foundry organization under which this DB instance is created.
- **Space** - This shows Space name in Cloud Foundry under which this DB instance is created
- **Instance Name** - Provide the name of instance. Note that the name of instance should start and end with an alphanumeric character and it can include the underscore character _.
- **Description** - Provide brief description of DB instance.
- **Administrator Password** - You need to provide the password of DB 'superuser "DBADMIN".
- **As per password policy** - The password must have at least 8 characters and comprise at least one uppercase letter, two lowercase letters, and at least one number. The password must not include the user name, the characters ' " ` \ ; [], or control characters, such as newline, backspace, tab.

Create Instance

1 Location and Basics

1. Location and Basics

SAP HANA database provides a single place to access, store, and process all enterprise data in real time.

Location

Choose the organization and space of your SAP HANA database instance. The memory size of your instance depends on the space.

Organization: * • • • v

Space: * • • • v

Basics

Provide a name and description for your instance.

Instance Name: *

Description:

The name of the SAP HANA database database:
- must start and end with alphanumeric characters
- can include the character _.

Cancel

1 Location and Basics

Provide a name and description for your instance.

Instance Name:* ⓘ

Description:

40 characters remaining

The administration user DBADMIN is automatically created with the instance. Enter a password for this account.
You use this user to log on to the SAP HANA cockpit and perform all initial user administration.

User: DBADMIN

Administrator Password:* ⓘ

Confirm Administrator Password:* ⓘ

Your password must be:

- at least 8 characters
- contain at least one UPPERCASE letter
- two lowercase letters
- at least one number

It CANNOT include:

- your user name
- the characters \ [" ` ;]
- control characters (newline, backspace, tab, whitespace, etc).

Next is to specify the parameters for SAP HANA DB:

- **Memory** - Provide the memory size for your HANA Database instance.
Note: If you are using Microsoft Azure, you can select from 32 GB to 3776 GB of memory and AWS, you can select from 30 GB to 3600 GB of memory.
- **Compute** - Provide the number of vCPU for SAP HANA database. This is usually allocated as per size of memory assigned.
- **Storage** - This is available storage space for SAP HANA database. This is allocated as per memory size of HANA database.

Note: Microsoft Azure, Storage value ranges 120 GB to 9480 GB.

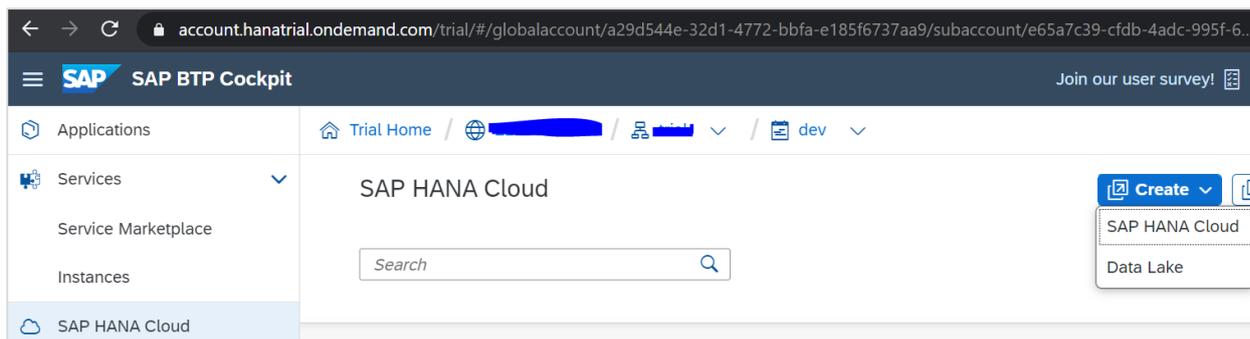
Amazon Web Services, Storage value ranges 120 GB to 9660 GB.

Provide Advance parameters for HANA Database and also for Data Lake if required and click on Create instance. This will create HANA DB instance in your HANA Cloud platform.

18. SAP HANA Cloud — Creating Data Lake instance

You can create a data lake to efficiently and securely store, manage, and analyze large amounts of structured, semi-structured, and unstructured data.

To create a Data Lake instance using SAP BTP cockpit. Navigate to SAP BTP cockpit → Select SAP HANA Cloud → Create → Data Lake.



Provide the below parameters related to Data Lake instance creation:

Location Details

- **Organization** - Provides the name of Cloud Foundry organization under which the instance is created.
- **Space** - Provides the name of Cloud Foundry space under which the instance is created.

Create Instance

1 General

1. General

Create a data lake to efficiently and securely store, manage, and analyze large amounts of structured, semi-structured, and unstructured data.

Location

Choose the organization and space of your data lake instance. The memory size of your instance depends on the space.

Organization:*  

Space:*  

Basics

Provide a name and description for your instance.

Instance Name:* 

Basic Settings:

- Instance Name- Provide the name of Data Lake instance (The instance name must start and end with alphanumeric characters and can include "-", "_", and "." characters).
- Note: Name of Data Lake instance must be different from the name of SAP HANA DB instance.
- Description- Brief description of the instance

Basics

Provide a name and description for your instance.

Instance Name:* 

Description:

40 characters remaining

 Updating space configurations and constants

Provide other parameters like Connection allowed, Data Lake IQ settings and click on Create instance. This will create a new Data Lake instance in HANA Cloud platform.

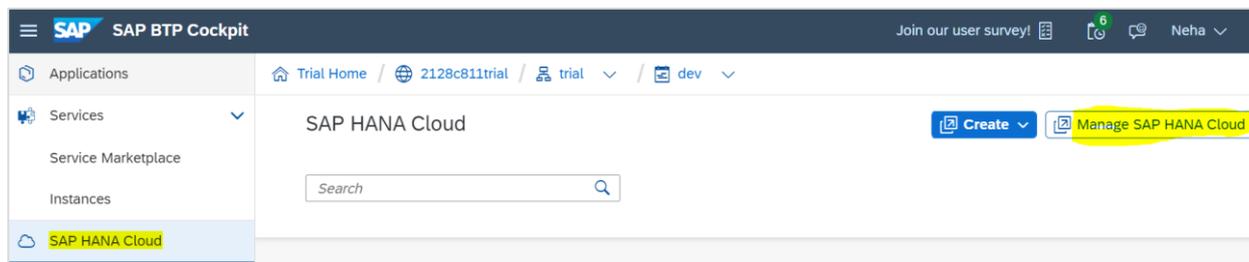
19. SAP HANA Cloud — Managing Instance

There is need to administrator and manage SAP HANA Cloud instance for Database and Data Lake. To manage the instance, navigate to SAP STP cockpit and navigate to SAP HANA Cloud Central.

Using SAP HANA Cloud Centra, you can perform below:

- View all SAP HANA Cloud instances that you have access
- To find an instance using instance ID assigned
- To create SAP HANA Cloud instances
- To stop and start an instance
- To check the instance status
- To review all the alerts and notifications
- To check memory, compute, and storage consumption.
- To make changes to an instance or deleting the instances
- To open HANA DB instance in SAP HANA cockpit and SAP HANA database explorer page
- To open Data Lake instance in Database Explorer page

To Manage SAP HANA Cloud instance, navigate to SAP BTP cockpit → Cloud Foundry space and choose → SAP HANA Cloud.



20. SAP HANA Cloud — Creating Tables

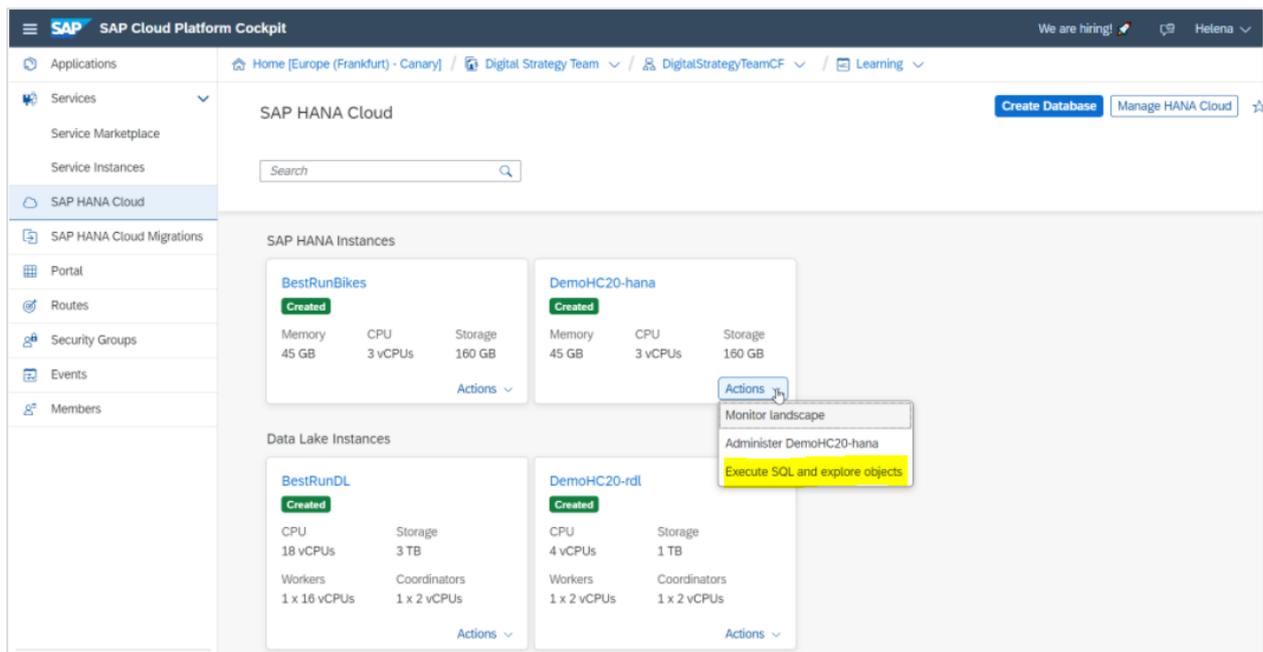
You can create tables in SAP HANA Cloud platform and load the data from various sources. Data load can be performed using SQL console option in Database Explorer. Usually two types of Database tables can be created.

- Physical or logical Tables- You can load and query data as normal DB tables
- Virtual Tables- These tables usually point to remote sources

Tables can be created at design time using SAP Web IDE and deploy using HANA Deployment infrastructure.

To create table, navigate to HANA Database Explorer and open your SAP HANA database instance. SAP HANA Database Explorer can be opened from "Actions" menu of SAP HANA Cloud instance → Execute SQL and explore Objects.

This will open SAP HANA Database Explorer in a new tab. For first time access, provide Database username and password.



In HANA Database Explorer, you can view the Databases available in your HANA Cloud platform. Each instance has its own Catalog → Navigate to Catalog tab of HANA DB and you can interact with the data in Database or create new tables/schemas or DB views.

Open an SQL console from the HANA Database Explorer by right-clicking on Database instance → Open SQL Console. Below functions can be performed:

To create a schema, you can use CREATE SCHEMA statement:

Ex: CREATE SCHEMA TEST1;

To create a table, you can use CREATE TABLE statement:

Ex: *CREATE COLUMN TABLE TEST1.Test (Pincode CHAR(5) PRIMARY KEY, City CHAR (30) NOT NULL, Country CHAR(10) NOT NULL);*

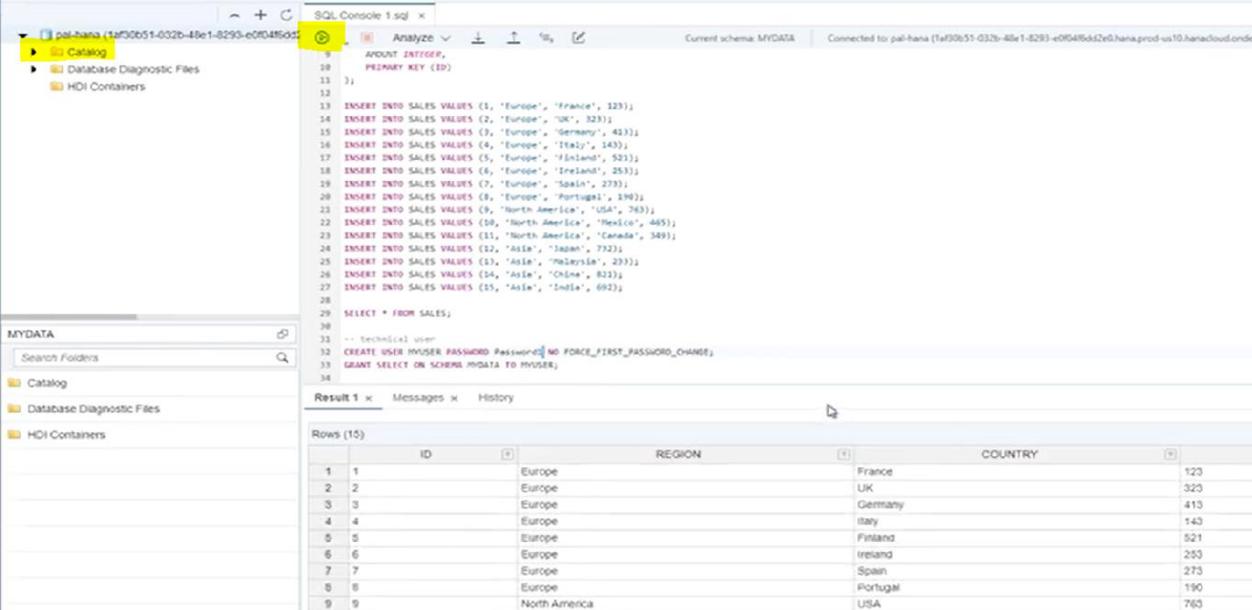
To insert the data into the tables, you can use INSERT statement:

Ex:

INSERT INTO Test1.Test VALUES ('12203','Hongkong','JAPAN');

INSERT INTO Test1.Test VALUES ('60601','Chicago','US');

INSERT INTO Test1.Test VALUES ('60615','Delhi','INDIA');



The screenshot shows the SAP HANA Cloud SQL Console interface. The main window displays a series of SQL statements, including several INSERT INTO SALES VALUES statements for different regions and countries, followed by a SELECT * FROM SALES; statement. The console also shows the execution of a CREATE USER and GRANT SELECT ON SCHEMA MYDATA TO MYUSER; statement. The bottom pane displays the result of the SELECT statement, showing 15 rows of data with columns ID, REGION, and COUNTRY.

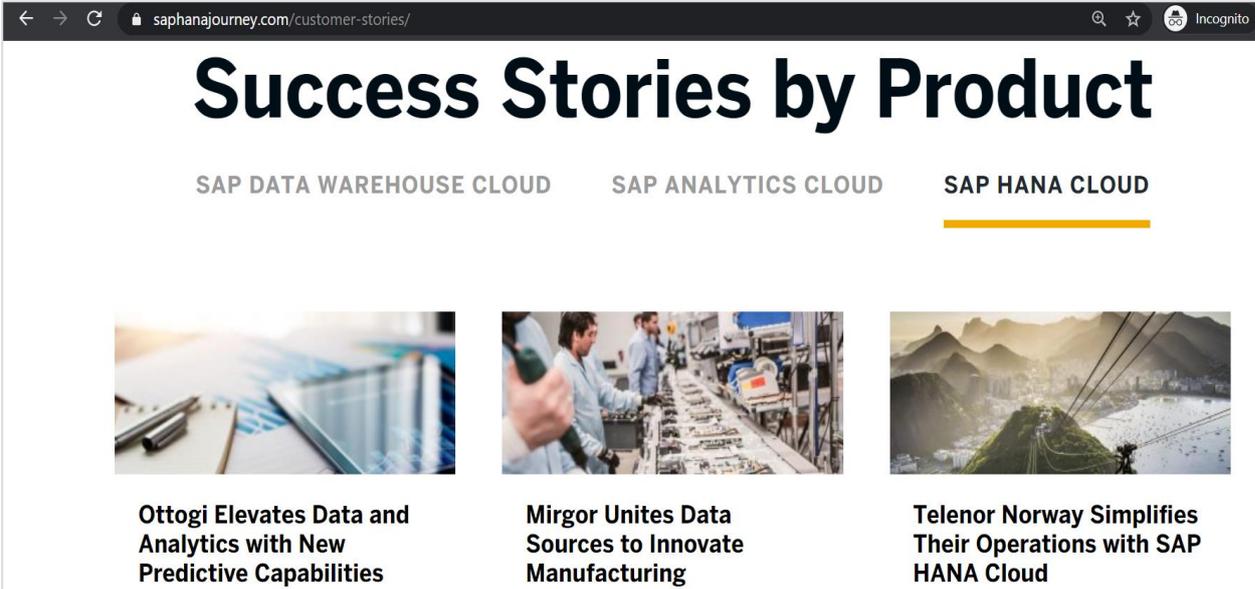
Rows (15)	ID	REGION	COUNTRY	
1	1	Europe	France	123
2	2	Europe	UK	323
3	3	Europe	Germany	413
4	4	Europe	Italy	143
5	5	Europe	Finland	521
6	6	Europe	Ireland	253
7	7	Europe	Spain	273
8	8	Europe	Portugal	190
9	9	North America	USA	765

21. SAP HANA Cloud — Success Stories

SAP HANA Cloud provides geospatial capabilities, Adaptive Server Enterprise, scalable HANA cloud solution for app development, extending current on-premise landscape to Cloud solution, Data Lake capabilities to take the analytics to new levels. You can extend SAP HANA on-premise system to HANA Cloud and this allows SAP HANA Cloud and On-premise landscape can be used together in a hybrid landscape.

You can access Customer stories using this URL:

<https://saphanajourney.com/customer-stories/>



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Success Stories by Product

SAP DATA WAREHOUSE CLOUD SAP ANALYTICS CLOUD **SAP HANA CLOUD**

Ottogi Elevates Data and Analytics with New Predictive Capabilities

Mirgor Unites Data Sources to Innovate Manufacturing

Telenor Norway Simplifies Their Operations with SAP HANA Cloud

22. SAP HANA Cloud Administrator — Responsibilities

Below are key responsibilities for SAP HANA Cloud Administrator:

- Moderate level of expertise in managing SAP HANA Cloud platform, Analytics Cloud Enterprise edition
- Experience with integrating SAP Cloud Platform with different modules like HCM, Sales Force, Success Factor and other ECC modules
- Experience with one or more Hyper scalers cloud platform Azure, AWS, GCP- at least of the mentioned preferred
- Hands-on experience with HANA Administrator tasks like DB migrations, Backup, and automation of Data load
- SAP HANA Cloud platform sizing for customer specific application development and Analytics scenarios
- Understanding business requirement and transforming to Technical design, deployment and administration
- Good understanding of Business processes, SAP ECC module functional understanding to integrate and deploy on Cloud platform
- Certification on SAP Cloud Platform Associate level