

# ADO tables of BW

Thursday, December 16, 2021 11:28 AM

Today

10:32 AM  
Hi Chris

Quick question...

What is the table name of EKKO in SAPABAP1 schema? I remember you mentioned we have a special naming convention for table names. Is there a place I can find the list (because I will need it for tables as well)? I am just trying to connect to that from XSA layer and would like to see the data.



Lore, Chris 10:34 AM  
You'll need to talk to the BW team.

They have an ADSO that EKKO is being written into.

10:35 AM  
ok



Lore, Chris 10:36 AM  
ZMM\_AD18 is the ADSO for EKKO  
ZMM\_AD19 is the ADSO for EKPO



10:43 AM  
I dont see them in SAPABAP1

for example, I can see ZSUPM\_INTERFACE



Lore, Chris 10:43 AM  
You'll have to talk to the BW team about that buddy.

I think it got put into a different schema and they just assumed it was in SAPABAP1.

10:44 AM  
hmmm....

ok

ok



Lore, Chris 10:44 AM  
SAPABAP1 is the core BW schema

10:44 AM  
ok



Lore, Chris 10:47 AM  
/BIC/AZMM\_AD182 is the table name



10:48 AM										
	MANDT	DICL_NAME	RECDNAME	COMP_CODE	DOC_DATE	DOCTYPE	BWAZ1	RF_DDL_IND	STATUS	CREATE_BY
1	200	4000000013	N	1001	7	P	UR	T	3	20010003 FEAC1
2	200	4000000049	N	1000	7	P	UR	T	9	20010007 FEAC2
3	200	4000000088	N	1000	7	P	UR	T	3	20010008 FEAC3
4	200	4000001105	N	1214	7	P	UR	T	3	20010012 CRGSH
5	200	4000001772	N	1214	7	P	UR	T	3	20010009 CRGSH
6	200	4000000001	N	1013	7	P	UR	T	3	20010006 ENRIS
7	200	4000000029	N	1000	7	ZUR	T	9	20040706 MACRE	
8	200	4000000010	N	1000	7	ZUR	T	9	20040709 MACRE	
9	200	4000000012	N	1000	7	ZUR	T	9	20040708 MACRE	
10	200	4000000011	N	1000	7	HAB	T	9	20040708 MACRE	

Works!!

I think it is important to understand the encrypted language 😊



Lore, Chris 10:53 AM  
May want look at /BIC/AZMM\_AD182  
ADSO will be named that way  
/BIC/A<ADSO name> and then a number

10:53 AM  
ok

Type a new message

7

SELECT * FROM m_tables where table_name like '/BIC/AZ%'	Query to pull all Z tables
select top 1000 * from "SAPABAP1"."/BIC/AZMM_AD182"	EKKO query
SELECT * FROM m_tables where table_name like '/BIC/AZMM_AD%'	

[10:36 AM] Lore, Chris

**ZMM\_AD18 is the ADSO for EKKO**

select top 1000 \* from "SAPABAP1"."/BIC/AZMM\_AD182"

[10:37 AM] Lore, Chris

**ZMM\_AD19 is the ADSO for EKPO**

select top 1000 \* from "SAPABAP1"."/BIC/AZMM\_AD182"

SELECT SCHEMA\_NAME, TABLE\_NAME, COLUMN\_NAME, POSITION  
FROM SYS.COLUMNS

WHERE SCHEMA\_NAME = 'SAPABAP1' AND TABLE\_NAME = '/BIC/AZMM\_AD242'  
 ORDER BY POSITION;

From <<https://answers.sap.com/questions/10126431/how-to-get-all-column-names-from-a-table-in-sap-ha.html>>

## List of tables

	SCHEMA_NAME	TABLE_NAME	RECORD_COUNT	TABLE_SIZE	IS_COLUMN_TABLE	TABLE_TYPE	IS_PARTITIONED	IS_REPLICATED	HAS_RECORD_COMMIT_TIMESTAMP
1	SAPABAP1	/BIC/AZBCK_TST92	0	1,328	TRUE	COLUMN	FALSE	FALSE	FALSE
2	SAPABAP1	/BIC/AZCP5_O0140	0	1,328	TRUE	COLUMN	FALSE	FALSE	FALSE
3	SAPABAP1	/BIC/AZEXT_O5140	0	1,328	TRUE	COLUMN	FALSE	FALSE	FALSE
4	SAPABAP1	/BIC/AZH5_O01740	0	1,328	TRUE	COLUMN	FALSE	FALSE	FALSE
5	SAPABAP1	/BIC/AZIBP_AO011	0	1,328	TRUE	COLUMN	TRUE	FALSE	FALSE
6	SAPABAP1	/BIC/AZMM_AD102	102	169,896	TRUE	COLUMN	FALSE	FALSE	FALSE
7	SAPABAP1	/BIC/AZMM_AD181	0	1,328	TRUE	COLUMN	TRUE	FALSE	FALSE
8	SAPABAP1	/BIC/AZSDC_O0500	0	1,328	TRUE	COLUMN	FALSE	FALSE	FALSE
9	SAPABAP1	/BIC/AZSDC_O0900	52,236	1,967,113	TRUE	COLUMN	FALSE	FALSE	FALSE
10	SAPABAP1	/BIC/AZSDC_O1000	13,488	895,801	TRUE	COLUMN	FALSE	FALSE	FALSE
11	SAPABAP1	/BIC/AZSDC_O1400	23,496	1,909,138	TRUE	COLUMN	FALSE	FALSE	FALSE
12	SAPABAP1	/BIC/AZSDC_O2340	76,337	1,147,576	TRUE	COLUMN	FALSE	FALSE	FALSE
13	SAPABAP1	/BIC/AZSDC_O2740	0	1,328	TRUE	COLUMN	FALSE	FALSE	FALSE
14	SAPABAP1	/BIC/AZSD_D042	176,758	4,978,614	TRUE	COLUMN	FALSE	FALSE	FALSE
15	SAPABAP1	/BIC/AZSD_D063	626,239	12,885,517	TRUE	COLUMN	TRUE	FALSE	FALSE
16	SAPABAP1	/BIC/AZSD_O6600	450	871,636	TRUE	COLUMN	FALSE	FALSE	FALSE
17	SAPABAP1	/BIC/AZSD_O7100	37,797	3,784,593	TRUE	COLUMN	FALSE	FALSE	FALSE

EKKO

Current schema: AA\_SUP\_SLT\_API | Connected to: BWVU@S

1\* select top 1000 \* from "SAPABAP1"/BIC/AZMM\_AD182

Result x Messages x History

Rows (1000)

MANDT	DOC_NUM	RECORDMODE	COMP_CODE	DOC_CAT	DOCTYPE	BSAKZ	RF_DEL_IND	STATUS	CH_ON	CREATE
1 200	4500000013	N	1001	F	UB	T		9		20030925 FEAC3
2 200	4500000049	N	1030	F	UB	T		9		20031007 GAFDC
3 200	4500000068	N	1030	F	UB	T		9		20031008 FEAC3
4 200	4500001183	N	1214	F	UB	T		9		20050422 CBD824
5 200	4500004772	N	1214	F	UB	T		9		20080820 C3322
6 200	4500006645	N	1213	F	UB	T		9		20100823 E92E0
7 200	4800000009	N	1030	F	ZUB	T		9		20040706 MADISE
8 200	4800000010	N	1030	F	ZUB	T		9		20040706 MADISE
9 200	4800000012	N	1030	F	ZUB	T		9		20040706 MADISE
10 200	4800000013	N	1030	F	ZIR	T		9		20040706 MADISE

## JAVA API project for ODATA V4

Tuesday, February 15, 2022 3:58 PM



Lore, Chris 2/3/2022 8:24 AM

anyway we've got XSA now (there's some issues with the QA and prod installs because it was port based instead of host based we didn't get good info from the SI)

2/3/2022 8:24 AM

yah....there are many things in this we have not explored

at least I have not 😊

I will try JAvA API



Sunday, February 6, 2022



Lore, Chris 2/6/2022 7:44 PM

This video has some of the different ways to use XSJS and XSODATA. It also includes setting up the security routing.

<https://www.youtube.com/watch?v=0md3wyOQ59g>



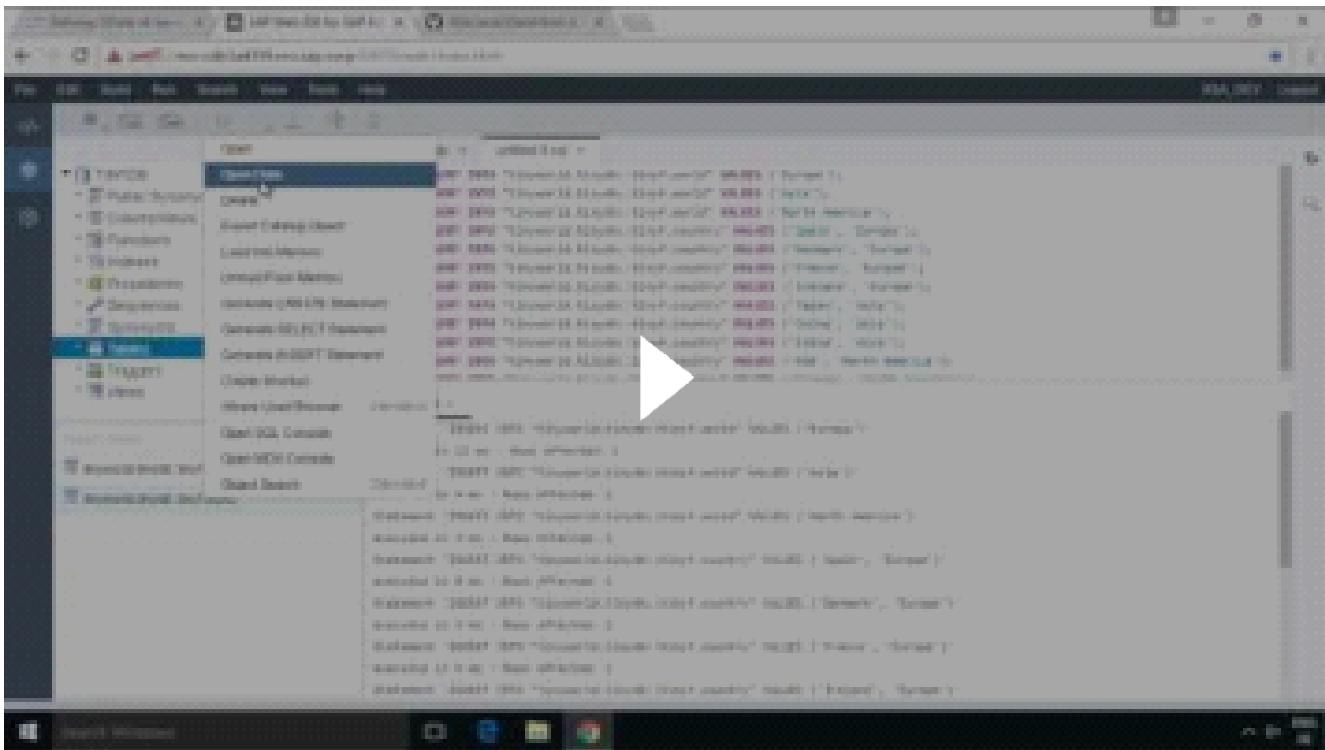
I tried setting up a java module but there's an internal error being thrown when adding the module. I couldn't get to the logs to look at what the problem is.

[SAP HANA Basics For Developers: Part 8.1 XSJS and XSODATA](#)

**SAP HANA Basics for Developers**  
**Part 8.1: XSJS and XSODATA**

[developers.sap.com](http://developers.sap.com)

[SAP HANA Academy - Web IDE for HANA: OData v4 with Java - Part 1 \[2.0 SPS 00\]](#)



# APIs register to APIGEE

Tuesday, January 4, 2022 10:55 AM

<a href="http://itsc7.tcc.etn.com/ServiceCatalog/navigation.do?go=sd&amp;entry=000000000134962">http://itsc7.tcc.etn.com/ServiceCatalog/navigation.do?go=sd&amp;entry=000000000134962</a>	API management admin work request
---	-----------------------------------

INC000015103880

From <<http://itsc7.tcc.etn.com/ServiceCatalog/submit.do>>

[10:39 AM] Vedula, Hari  
is there a established process to open Firewall ports?

[10:39 AM] Joshi, Shilna N  
You need to raise a request to add your server to the reverse proxy if not already done

[10:40 AM] Joshi, Shilna N  
The platform team will raise the firewall request

[10:40 AM] Vedula, Hari  
do you have any documentation or simillar request that was created before?

[10:45 AM] Joshi, Shilna N  
[JOE / Information Technology \(etn.com\)](#)

[10:45 AM] Joshi, Shilna N  
Try this one

[10:45 AM] Joshi, Shilna N  
I dont have a sample one.. but please provide your http endpoint and mention that that you want it connected from Ngnix to Apigee

[10:45 AM] Joshi, Shilna N  
Apigee --> Ngnix --> Your server

[10:46 AM] Vedula, Hari  
hmmm.....that is very helpful....I will try that....

[10:46 AM] Vedula, Hari  
thank you so much

[10:46 AM] Joshi, Shilna N  
np

[10:47 AM] Joshi, Shilna N  
Fred Bielskis or Soumyadeep Bhattacharjee are the platform team contacts for Apigee like 1

[10:48 AM] Vedula, Hari

I will create the request first and check with them ....hopefully, it should not be a difficult....

[10:48 AM] Joshi, Shilna N

It is not difficult as long as port is open

[10:49 AM] Joshi, Shilna N

If not, it will take some time

[10:49 AM] Vedula, Hari

ok

[10:49 AM] Joshi, Shilna N

This is a one time setup for a new application

[10:49 AM] Vedula, Hari

for additional APIs we dont need to do it...correct?

[10:50 AM] Joshi, Shilna N

right.. as long as it is on the same server

[10:50 AM] Vedula, Hari

ok

[10:50 AM] Joshi, Shilna N

And you dont need this setup if your API is on the cloud

[10:50 AM] Joshi, Shilna N

This is only for on-prem

[10:51 AM] Vedula, Hari

yah...makes sense

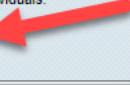
The screenshot shows the SAP SRM incident creation interface. The 'Assignment' tab is active. A dropdown menu for 'Assignee+' displays a list of names. Red arrows point to the names 'arti jethani' and 'soumyadeep bhattacharjee' in the list.

Assignee	Notes	Status	Impact	Priority	Weight
ankita mor	Summary	Assigned	4-Minor/Localized	Medium	
arti jethani					
fred e bielskis					
jameer k sheikh					
joel m kirchmeyer					
joshua j loomis					
pankaj r patil					
snehal s khandagale					
soumyadeep bhattacharjee					

Effort Time Spent Minutes	0
Total Time Spent Minutes	0
Stopped      Update Assignment Log	
Save      Print	

Groups: 0  
Individuals: 0

joel m kirchnmeyer  
joshua j loomis  
pankaj r patil  
snehal s khandagale  
soumyadeep bhattacharjee  
tanmayee patil



# Sandbox

Friday, September 17, 2021 2:22 PM

## Service Connection

Add SAP HANA Service Connection

Service is connected to the SAP HANA Database.

Type: Non-HDI Container

Action: Create a new user-provided service

\* Service Name: Hari\_BWX\_UPS

\* Host: sapuxhbd.tcc.etn.com

\* Port: 30015

\* User: E9811861

\* Password: .....  


\* Organization: Eaton

\* Space: Dev



## How to add database

D47200\_HBD01

Search Folders: 

Catalog

Database Diagnostic Files

HDI Containers

Properties

Database Type: SAP HANA Database (Multitenant)

\*Host: sapuxhbd.tcc.etn.com

\*Instance number: 00

\*Port number: 30013

\*Database:  System database  Tenant database Name: BWD

\*User: E9811861

\*Password: 

Save password (stored in the SAP HANA secure store)

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

Verify the server's certificate using the trusted certificate below

Advanced Options:

OK Cancel

<https://answers.sap.com/questions/12719402/the-service-definition-does-not-exist-in-hana-xsa-.html>

<https://sabazar.com/articles/item/2295-common-errors-and-fix-xsa-web-ide-for-hana-developments>

<https://blogs.sap.com/2020/01/25/common-errors-and-fix-xsa-web-ide-for-hana-developments/>

<https://sapuxhbldb.tcc.etn.com:51040>

<https://sapuxhbldb.tcc.etn.com:53077>

## User provided services - update password for connection

Thursday, December 9, 2021 2:30 PM

The screenshot shows the SAP HANA X5 Advanced Cockpit interface. On the left, a sidebar menu is open with the 'User-Provided Services' option selected, indicated by a red arrow. The main content area displays a list of instances under the heading 'Space: DEV - User-Provided Services'. One instance, 'Har\_BWD\_ups', is selected and highlighted with a red arrow. A modal dialog box titled 'Modify User-Provided Service Instance' is open over the list, showing the instance name 'Har\_BWD\_ups' and its credentials. The credentials JSON object is as follows:

```
[{"password": "Venkatjan@0@1", "driver": "com.sap.db.jdbc.Driver", "port": "30047", "host": "sapuxhbd.tcc.etn.com", "user": "E9811861", "tags": "hana"}]
```

The modal also includes 'Save' and 'Cancel' buttons at the bottom.

# User provider services

Monday, December 13, 2021 4:14 PM

<https://developers.sap.com/tutorials/xsa-create-user-provided-anonymous-service.html>

<https://blogs.sap.com/2019/04/02/xsa-accessing-remote-sources-external-objects-schemas-etc/>

```
{  
    "schema": "SAPABAP1",  
    "tenant_name": "BWD",  
    "password": "EatOnBWD$",  
    "driver": "com.sap.db.jdbc.Driver",  
    "port": "30047",  
    "encrypt": false,  
    "db_hosts": [  
        {  
            "port": 30047,  
            "host": "sapuxhbd.tcc.etn.com"  
        }  
    ],  
    "host": "sapuxhbd.tcc.etn.com",  
    "user": "XX_SUP_SLT_API",  
    "url": "jdbc:sap://sapuxhbd.tcc.etn.com:30047/?currentschema=SAPABAP1",  
    "tags": [  
        "hana"  
    ]  
}
```

```
{  
    "password": "EatOnBWD$",  
    "driver": "com.sap.db.jdbc.Driver",  
    "port": "30047",  
    "host": "sapuxhbd.tcc.etn.com",  
    "user": "XX_SUP_SLT_API",  
    "tags": "hana"  
}
```

# Switch from BWP to BW1 - user provided services

Monday, March 4, 2024 3:56 PM

BWP

```
{  
    "password": "BWP_slt_2Pw$",  
    "driver": "com.sap.db.jdbc.Driver",  
    "port": "30041",  
    "host": "sapuxhbpv.tcc.etn.com",  
    "user": "XX_SUP_SLT_API",  
    "tags": "hana"  
}  
  
XX_SUP_PC_API  
BW1 :-  
{  
    "password": "BW1pcapi$", BWP_slt_2Pw$  
    "driver": "com.sap.db.jdbc.Driver",  
    "port": "30541",  
    "host": "sapuxhb1.tcc.etn.com",  
    "user": "XX_SUP_SLT_API",  
    "tags": "hana"  
}
```

BW2 :-

```
{  
    "password": "xspcBW2pw$",  
    "driver": "com.sap.db.jdbc.Driver",  
    "port": "31041",  
    "host": "sapuxhb2.tcc.etn.com",  
    "user": "XX_SUP_PC_API",  
    "tags": "hana"  
}
```

BWD

```
{  
    "password": "PC4bwddapi$!$",  
    "driver": "com.sap.db.jdbc.Driver",  
    "port": "30047",  
    "host": "sapuxhbd.tcc.etn.com",  
    "user": "XX_SUP_PC_API",  
    "tags": "hana"  
}
```

BWD:

SERVICE\_NAME;PORT;SQL\_PORT;HTTP\_PORT  
indexserver;30,046;30,047;30,048

BW1:

SERVICE\_NAME;PORT;SQL\_PORT;HTTP\_PORT  
indexserver;30,540;30,541;30,542

BW2:

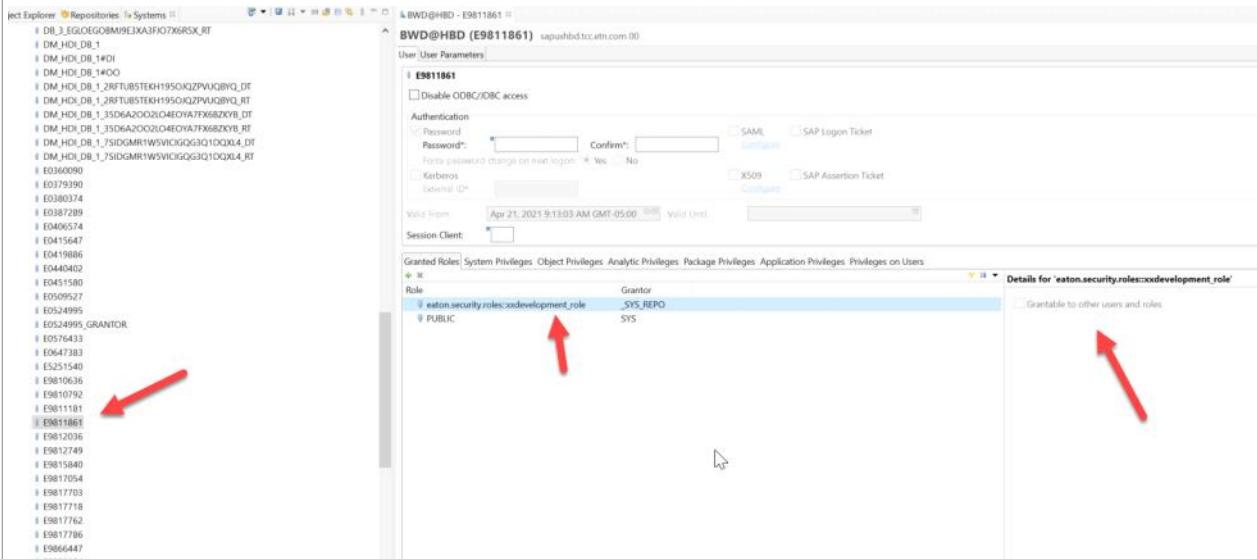
SERVICE\_NAME;PORT;SQL\_PORT;HTTP\_PORT  
indexserver;31,040;31,041;31,042

BWP:

SERVICE\_NAME;PORT;SQL\_PORT;HTTP\_PORT  
indexserver;30,040;30,041;30,042

## Steps to connect to DB

Friday, September 10, 2021 9:37 AM

1	Create a role which provides <b>READ (select)</b> access of classical schema D47_SLT (let's call it <b>D47_ST_ACCESS</b> )	Not started
2	Create an application user (could be a technical user) -> this user will be used to create a user provided service later on  <b>D47SLTUSER</b>	Not started
3	Assign role to the user (as grantable to others so that they can also grant it to app user)	Not started
4	Create a resource (user provided service)	<b>Completed using E9811861</b>
5	Add user provided service as a resource	<b>Completed using E9811861</b>
6	Application user / Schema owner need to have access to the Classical schema (granted using HBDGRANTS file )  	<b>ERROR</b>
7	Once DB module is built, access will be granted to the container users for the schema.  Create a Synonym (file with extension hdbsynonym) in XSA db module to be able access the tables of foreign schema	

We cannot test the Cross-schema access if we use E9811861 Schema (because BWD schema is a separate schema)

- 1) Import the dummy schema
- 2) Create a role with access to dummy schema
- 3) Create a user - assign above role
- 4) Create a Granter user (with access to above role and access to grant access role).

D47200HBD01

## Supplier Portal ODATA URLs - DUPLICATE DELETE LATER

Tuesday, January 18, 2022 3:43 PM

<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrders_xsodata/PurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000100007%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrders_xsodata/PurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000100007%27</a>	With FILTER	PurchaseOrders	Search POs by Vendor
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrderItems_xsodata/PurchaseOrdersItems?/\$top=10&amp;format=json&amp;\$filter=PurchaseOrder%20eq%20%27410000001%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrderItems_xsodata/PurchaseOrdersItems?/\$top=10&amp;format=json&amp;\$filter=PurchaseOrder%20eq%20%27410000001%27</a>	With FILTER	PurchaseOrdersItems	Search by PurchaseOrder for getting item details
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrderScheduleLines_xsodata/PurchaseOrderScheduleLines?/\$top=10&amp;format=json&amp;\$filter=PurchaseOrder%20eq%20%27410000001%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrderScheduleLines_xsodata/PurchaseOrderScheduleLines?/\$top=10&amp;format=json&amp;\$filter=PurchaseOrder%20eq%20%27410000001%27</a>	With FILTER	PurchaseOrderScheduleLines	Search by PurchaseOrder for schedule lines
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersAll_xsodata/POHeader?/\$top=10&amp;format=json&amp;\$expand=POItem&amp;\$filter=PurchaseOrder%20eq%20%27410000001%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersAll_xsodata/POHeader?/\$top=10&amp;format=json&amp;\$expand=POItem&amp;\$filter=PurchaseOrder%20eq%20%27410000001%27</a>		BOTH Header and Items in Same service	Search by PurchaseOrder
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersAll_xsodata/POHeader?/\$top=10&amp;format=json&amp;\$expand=POItem&amp;\$filter=Vendor%20eq%20%270000100007%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersAll_xsodata/POHeader?/\$top=10&amp;format=json&amp;\$expand=POItem&amp;\$filter=Vendor%20eq%20%270000100007%27</a>		Both header and items for all Pos of a Vendor	
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000100007%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000100007%27</a>		All data at header level	Filter by Vendor
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000100007%27and%20Plant%20eq%20%271005%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000100007%27and%20Plant%20eq%20%271005%27</a>		All data at header level	Filter by Vendor and Plant
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=StorageLocation%20eq%20%27100X%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=StorageLocation%20eq%20%27100X%27</a>		Search by Storage Location	
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000002888%27and%20PurchaseDocumentType%20eq%20%27ZN%27and%20StorageLocation%20eq%20%275018%27">https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\$top=10&amp;format=json&amp;\$filter=Vendor%20eq%20%270000002888%27and%20PurchaseDocumentType%20eq%20%27ZN%27and%20StorageLocation%20eq%20%275018%27</a>			
<a href="https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersDetails_xsodata/POItems?/\$top=10&amp;format=json&amp;\$expand=POVendorConfirmations,POScheduleLines">https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersDetails_xsodata/POItems?/\$top=10&amp;format=json&amp;\$expand=POVendorConfirmations,POScheduleLines</a>		All Schedulings and POVendorConfirmations	
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[https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders\\_xsodata/TrippLiteSupplierPortalPurchaseOrders?/\\$top=10&format=json&\\$filter=PurchaseOrder%20eq%20%2748000000712%27](https://sapuxhbd.tcc.etn.com:51069/xsodata/TrippLiteSupplierPortalPurchaseOrders_xsodata/TrippLiteSupplierPortalPurchaseOrders?/$top=10&format=json&$filter=PurchaseOrder%20eq%20%2748000000712%27)

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<a href="https://answers.sap.com/questions/10426871/pass-multiple-values-to-a-field-in-odata-for-filte.html">https://answers.sap.com/questions/10426871/pass-multiple-values-to-a-field-in-odata-for-filte.html</a>	Pass multiple Values to filter parameter
<a href="https://www.w3schools.com/tags/ref_urlencode.asp">https://www.w3schools.com/tags/ref_urlencode.asp</a>	HTTP URL Encoding reference

Vendor%20eq%20%270000100007%27  
 Vendor eq '0000100007'  
 Vendor eq '0000100007' and CompanyCode eq '1001'  
 Vendor%20eq%20%270000100007%27and%20CompanyCode%20eq%20%271001%27

%20	space
%27	'

Vendor%20eq%20%270000100007%27and%20Plant%20eq%20%2721005%27

Vendor%20eq%20%270000100007%27and%20Plant%20eq%20%2721005%27  
 Vendor%20eq%20%270000100007%27and%20Plant%20eq%20%2721005%27

[MATNR%20eq%20%27000000078101119705%27and%20ERDAT%20gt%20%2720200101%27](https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersAll_xsodata/POHeader?/$top=10&format=json&$filter=Vendor%20eq%20%2710012010%27)  
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KEY

[https://sapuxhbd.tcc.etn.com:51074/xsodata/salesOrder.xsodata/A\\_SalesOrder\(%270068314748%27\)](https://sapuxhbd.tcc.etn.com:51074/xsodata/salesOrder.xsodata/A_SalesOrder(%270068314748%27))

```
service {  
    "salesOrderAPI.DB.models::salesOrderHeader" as "A_SalesOrder" key("SalesOrder")  
    navigates("to_items" as "to_Items");  
  
    "salesOrderAPI.DB.models::salesOrderItems" as "to_Items" key("SalesOrder","SalesOrderItem");  
  
    association "to_Items" principal "A_SalesOrder"("SalesOrder") multiplicity "1" dependent "to_Items"("SalesOrder") multiplicity y **;  
}
```

From <<https://teams.microsoft.com/multi-window/?agent=electron&version=22010300408>>

[https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersDetails.xsodata/POItems/?\\$top=10&format=json&\\$filter=Vendor%20eq%20%27%21CIRELAND%27and%20PurchaseDocumentType%20eq%20%27%21N%27and%20StorageLocation%20eq%20%275018%27&\\$expand=POVendorConfirmations.POScheduleLines.POPurchaseDocumentHistory.POMaterialStorageConditions](https://sapuxhbd.tcc.etn.com:51069/xsodata/purchaseOrdersDetails.xsodata/POItems/?$top=10&format=json&$filter=Vendor%20eq%20%27%21CIRELAND%27and%20PurchaseDocumentType%20eq%20%27%21N%27and%20StorageLocation%20eq%20%275018%27&$expand=POVendorConfirmations.POScheduleLines.POPurchaseDocumentHistory.POMaterialStorageConditions)

'1234'

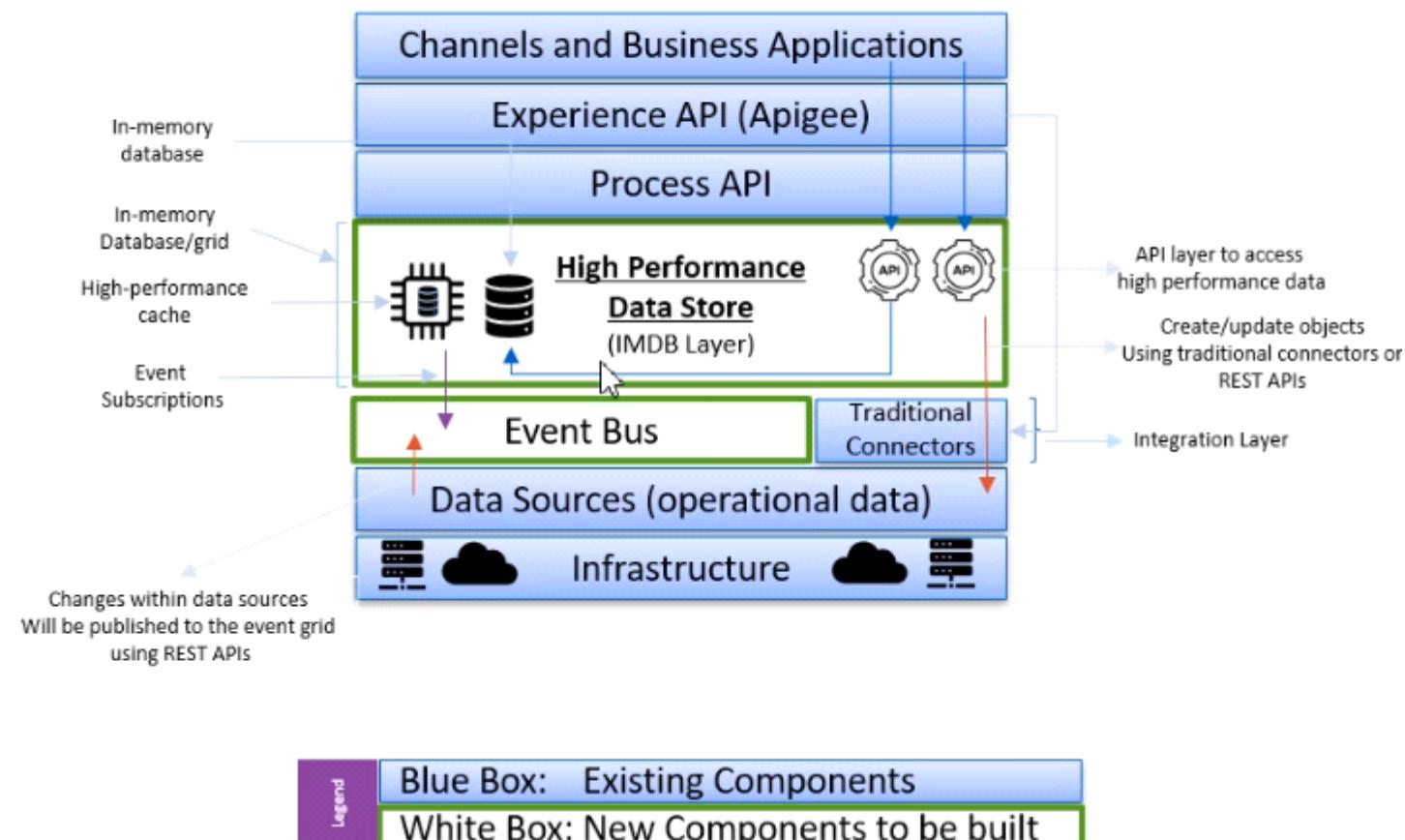
# Hana OLD POC

Wednesday, March 3, 2021 8:08 AM

Subject	<b>Hana POC</b>
From	Corrigan, Malcolm
To	Gorla, Raj; Vedula, Hari
Cc	Lore, Chris; Svoboda, Jess R
Sent	Thursday, February 25, 2021 2:58 PM

For the Hana POC can you create a slide similar to the one below? This is something that the enterprise architecture team were talking about today, they want to create a high performance data store...but we've done something very similar so I'd like to have this in a PPT as part of the Hana POC overview.

## PoC - Technical Solution



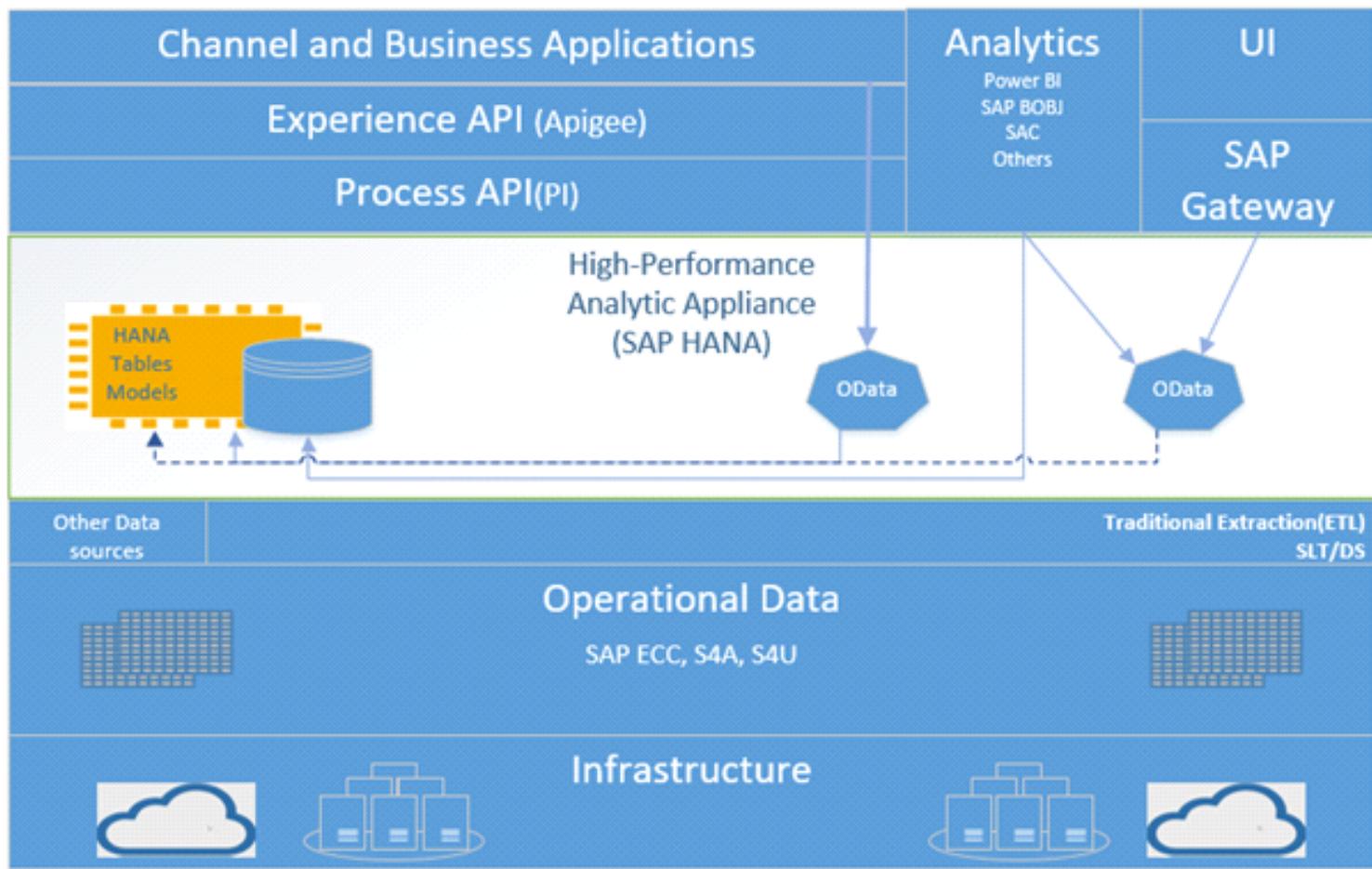
Regards  
**Malcolm Corrigan**

Director, SAP Solution Design and Governance – PROCOE, Eaton  
1000 Eaton Boulevard | Cleveland, Ohio 44122  
Mobile: +1 267 496 3630

**Office:** +1 440 523 3758  
[malcolmcorrigan@eaton.com](mailto:malcolmcorrigan@eaton.com)

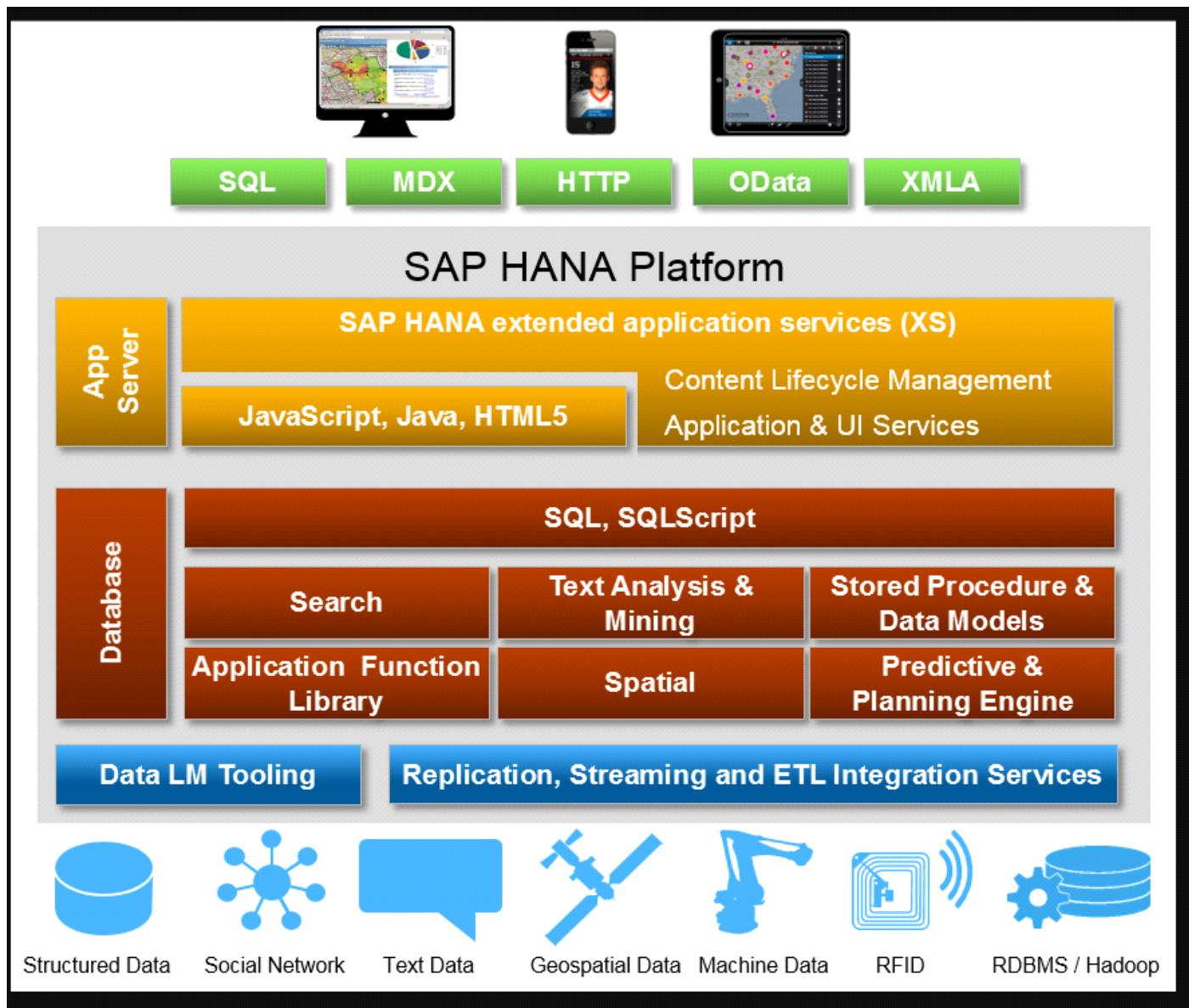
# HANA OLD POC

Friday, March 5, 2021 9:03 AM



# Xsa overview

Tuesday, June 21, 2022 7:30 AM



# Calculation view

Sunday, July 3, 2022 2:45 PM

- Calculation view is better than CDS view- it creates a column view (better performance compared to CDS view)
  - Join
  - Union
  - Projection
  - Aggregation
- Naming standards for :-
  - Joins
  - Projections
  - Unions
  - Aggregations

# XS Advanced for (not so) dummies | SAP Blogs

Thursday, July 21, 2022 4:36 PM

Clipped from: <https://blogs.sap.com/2017/09/04/xs-advanced-for-not-so-dummies/>

My career in the SAP ecosystem started in the beautiful, comfy world of ABAP. After some time doing C++ and Java, ABAP presented itself as the awesome language that masked the database and built the UI for you. Back in those days when you manually built the field catalog for an ALV, finding out what actual SQL the database needed or drawing the UI were usually uncommon tasks.



If my self from those times wanted to do some SAP HANA native development with XS Advanced, dummy or not, she would be completely lost and would need to start from the very basics. Even if you have been doing some XS Classic development, [now that it is officially deprecated as of SPS02](#), you may also need to catch up with some concepts.

This post is dedicated to my (not so) dummier self. I hope it also works for anyone who is looking to get started with SAP HANA native development using its most current, embedded application layer and tools.

## Cloud Foundry

The [history of XS Advanced](#) starts with the need to both scale and keep the SAP Cloud Platform and on-premise editions consistent but flexible. Cloud Foundry is an application platform that:

- **is open-source:** even my dummier self knew what this is, but just in

case, [this site explains the benefits](#)

- **is container-based:** In my own dummy words, a container is like a virtual machine but on top of the operating system and without the hypervisor or player. In more pro words, a container packages an application with its code, the libraries it needs, the runtime environment and system tools and isolates it from the operating system. Multiple containers will share a common operating system and the resources it manages (RAM, filesystem, etc). This topic is vast and very interesting. You can get more information from one of the leading container platforms, [Docker](#).
- allows for **multiple programming languages:** There are some magical elves called buildpacks in Cloud Foundry. When you push an application, the platform will check in which language it was written and retrieve a set of scripts that will bring all the dependencies for your application and generate the compiled code or equivalent executables. Although [the list of Cloud Foundry buildpacks](#) is very promising, XSA currently provides dedicated support to Node.js and Java.
- **decouples applications from infrastructure:** This translates to enabling **multi-cloud**. In other words, freedom to choose what you run and in which cloud provider (e.g., Amazon Web Services, MS Azure, Google Cloud Platform) depending on different factors such as cost, geographical proximity or compliance, regardless of the underlying infrastructure.

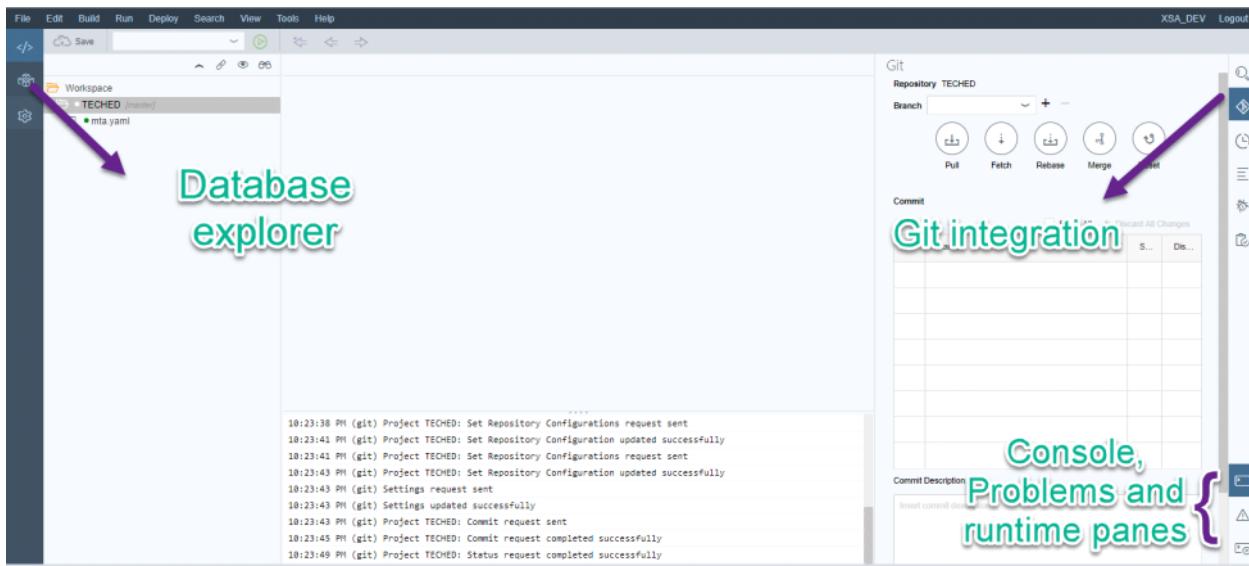
All of this is not necessarily applicable to XSA. This first concept in itself is HUGE. Almost everything of what is coming next is related to this, so please bear with me.



## SAP Web IDE for SAP HANA

You will later see that with this new architecture come, at least, two things: some more complexity than just a database and script on top of it and a whole new world of possibilities. The complexities are tackled by understanding the why of what you are doing (and they bring the benefit of robustness, among others). The possibilities are gracefully enabled by the new development environment. This is SAP Web IDE for SAP HANA.

Behold!



*There's more than meets the eye here, but it would mean an entire new blog post. You should really try it out.*

Thanks for everything, HANA Studio!

Here is the first piece of news: if you were using SAP HANA Studio, **you do not need it any more**. As you can see, the Web IDE has got your back and has everything (**and more**) covered. Rephrasing, the Web IDE covers everything HANA Studio could do in terms of development(\*) but HANA Studio cannot do what the Web IDE and Database explorer do.

If you are missing the Administration Cockpit (or the site telling you it is not there anymore), you will find it is also a part of the XS Advanced applications.

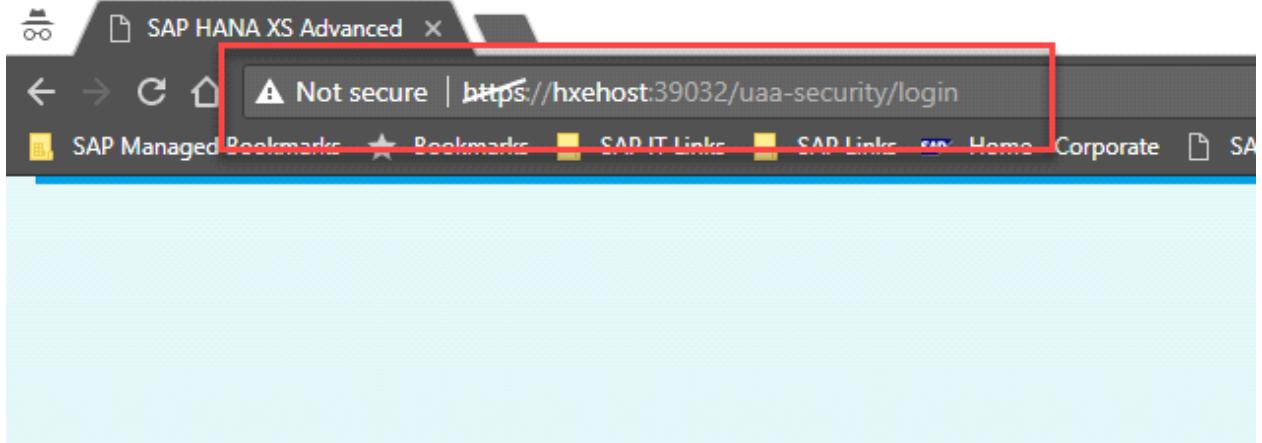
Another thing you might notice is the Git integration (c'mon, I put an arrow to it...). This is because files will not live in a repository in HANA either. The internal source code repo will also say goodbye.

(\*) *The only feature I have spotted that is missing is the "Import from File" wizard that created a table straight form an Excel spreadsheet, though there are plenty of alternatives to achieve this in Web IDE.*

Give it a try

The default port for Web IDE in an SAP HANA, express edition, is 53075. So unless you've changed it, you can access the Web IDE with URL <https://<hostname>:53075>.

Right after you enter the URL, you will be redirected to a new address and a different port. That is the User Account and Authentication service:



Witchcraft? Nope, that is UAA providing you with an OAuth token... and we need to go into the architecture piece to understand this and many other concepts first.

Let's dig deeper into the key architecture concepts in the second part of this blog post here: <https://blogs.sap.com/2017/09/05/xs-advanced-for-not-so-dummies-pt-2-multi-target-applications/>

The third part, Multi target Applications can be found here: <https://blogs.sap.com/2017/09/22/xs-advanced-for-not-so-dummies-pt-3-microservices/>

And the last piece, about Routing is here: <https://blogs.sap.com/2018/02/16/xs-advanced-for-not-so-dummies-routing/>

Stay tuned on [Twitter](#) or on [LinkedIn](#) !

# XS Advanced for (not so) dummies – pt 2: Multi Target Applications | SAP Blogs

Thursday, July 21, 2022 4:35 PM

Clipped from: <https://blogs.sap.com/2017/09/05/xs-advanced-for-not-so-dummies-pt-2-multi-target-applications/>



We got a basic understanding of what is Cloud Foundry [in the first blog post](#).

Did SAP just grabbed Cloud Foundry and put its logo on it? Of course not. We have a very powerful database called HANA and a whole set of tools were already in place and being used by devs out there. This was about combining existing capabilities and porting the already powerful onto the more scalable and *multi-cloudable*. Some of the Cloud Foundry characteristics were not adopted and the proper SAP adaptations were performed.

Let's drop the buzzwords and understand this mashup:

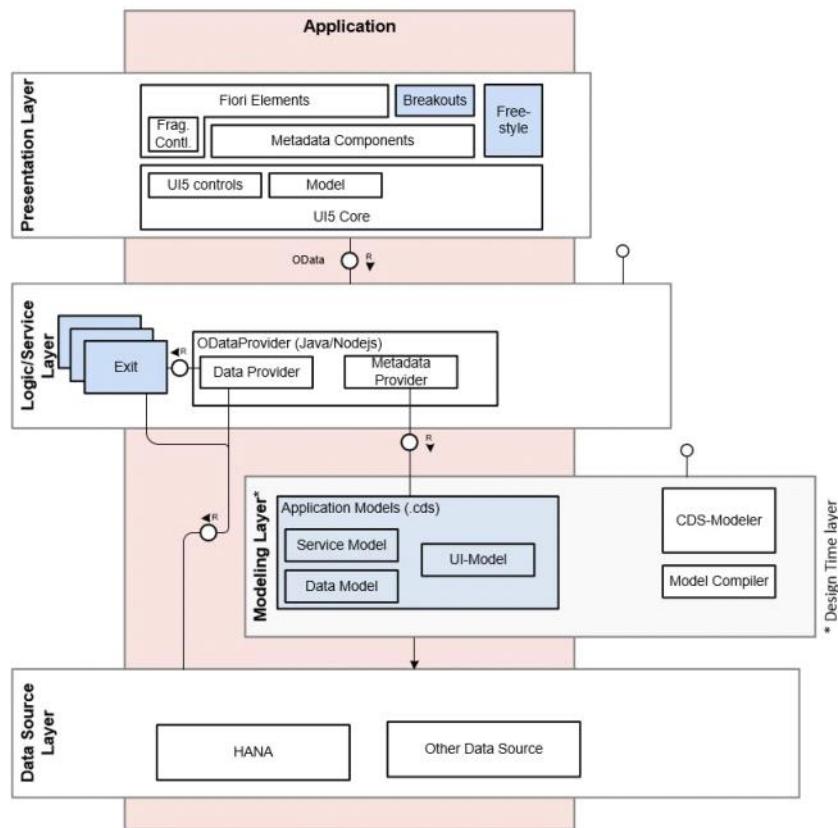
## What are Multi Target Applications?

This sounds like one of the (many) cases of fancy names for something simple. You'll tell me if this applies later...

Typically, an enterprise application will access the database and have coding to add business logics to the data (or share data to another system, or nag a user for action, or insert more data, etc). This application is normally defined by somebody, coded and unit tested by someone (else), validated as a part of a bigger picture and finally moved to a productive environment. We call this **lifecycle**, right?

More technically, we have a user interface, we have *some logics* and then we have the database.

The *some logics* part is not as innocent: A fullstack coder friend of mine used to talk about “the backend of the frontend” and “the backend at the back”. In other words, you could even have business logics in two different places: the coding feeding the UI and the logics embedded in the database modelling. **Different components (layers), same lifecycle:**



In our new architecture, each of these layers can be mapped to a different box in the XS Advanced architecture diagram (presentation layer at UI5, backend logics to Node.js or Java and the modelling and database at the base).

I'll let you add the arrows mentally for this one:

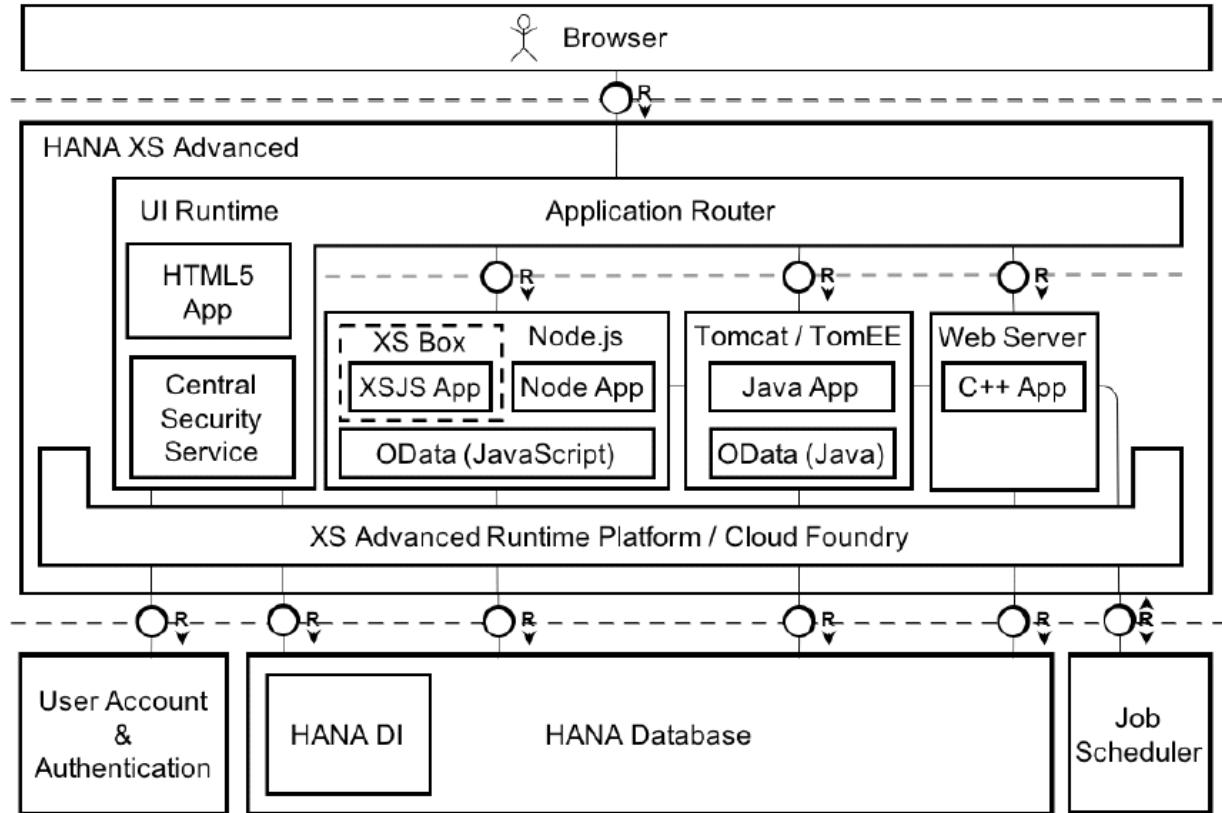


Figure 2: XS Advanced System Architecture

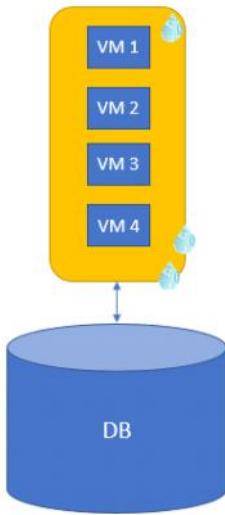
First, let us respond to the original question. A Multi Target Application is an application whose runtimes are provided by the different boxes or components but only serves a business purpose if those components are held together through its lifecycle.

*(I hope you can produce your own definition and tell me if the name is just fancy)*

For example, you will develop a piece in UI5, another piece in Node.js and a CDS view that taps the database. Each of these could even be created by different developers or executed separately but they would make no sense unless they are treated as a single business application on its way to the productive environment.

*Let's go deeper into the technical level...*

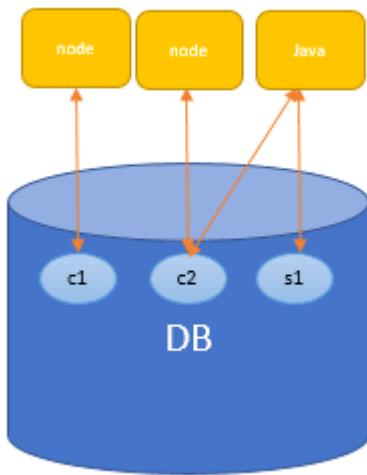
In the XS Classic approach, each of these “boxes” would have run all of the different applications in copies of the same (JavaScript) virtual machine, against a connection to a schema in the database administered by the applications. That is, a single operating system process eventually catered for all of the runtime needs of each of our different coding masterpieces. You could sometimes see the XS Engine process sweating...



### *The monolithic process serving all VMs*

In the new approach, for the logics piece in Java or Node.js, a “copy” of the box (call it runtime) is created and bound to a specific application. Even the database binds a dedicated instance of itself to a single application in the shape of a container (note that I am not using the word “copy” for the database... that would be huge).

This way, our business application will get its own piece of Node.js runtime with everything it needs to execute its code as a separate operating system process. Something more like this:



Those copies of the runtime are called “**microservices**”... the name is not as fancy, but I can assure you it’s a bit tricky.

We can take a deeper look into this architecture and its implementation in the [next blog post](#)

Let’s stay in touch on [Twitter](#) or on [LinkedIn](#) !

# XS Advanced for (not so) dummies – pt 3: Microservices | SAP Blogs

Thursday, July 21, 2022 4:36 PM

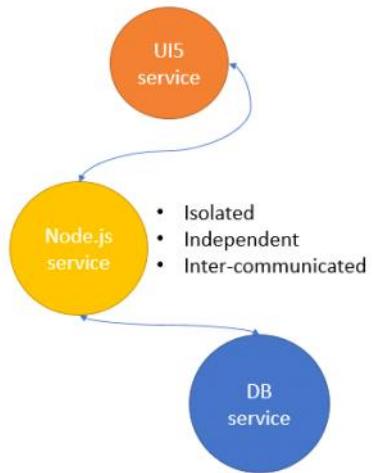
Clipped from: <https://blogs.sap.com/2017/09/22/xs-advanced-for-not-so-dummies-pt-3-microservices/>



In the [previous post](#), we saw that a Multi Target Application comprises a set of modules that, executed together, form a business application with its own lifecycle. We also found that those modules are executed as microservices.

## What are Micro-services?

Micro-services are independent modules in the sense that they can be executed and **deployed** separately. They are also isolated from each other and share no resources between themselves, even if that means packaging the same library twice in different modules and into their own runtime environments. These modules also offer an interface to communicate with each other (e.g., an OData service, JDBC, etc.).



I think one of the key behaviors in micro-service architecture, the one that helps to understand the isolation and independence, is that they can be deployed separately. In other words, you can make some changes to, for example, the Node.js module, re-build and re-deploy it and you would not need to restart or re-deploy the other two modules.

This also means that if a single service crashes for whatever the reason (usually not our fault, we're great developers...), the rest of the services are not necessarily disrupted or at least have the chance to crash gracefully. A very tangible example of this is that you can change the service instance of the UI5 library, re-build **only** the web module and see the changes in execution immediately. The Node.js and database modules will not even notice (and if you think about it, there is generally no reason for them to notice).

When you "activate" your application (or *push*, in our new Cloud Foundry jargon), the micro-services for each module are created.

## How is this glued together?

I don't want to be reiterative, but these independent, isolated, etc. services do not make any sense unless they are all glued together and serve a business purpose. Explained to my ABAPer self, the equivalent to a FRICEW object, with its own gap or business requirement to fulfill is the Multi-Target Application.

Technically, there is a file that declares this cocktail of modules is a single application and it also explains how these services are bound to each other and in which order they should be deployed.

This file, called *development descriptor* is filled mostly automatically for you as you create modules in Web IDE. Of course you will need to add the necessary information to glue your modules together as it cannot yet read your mind.

Here is a sneak peak of the file you will edit in Web IDE (called MTA.yaml)

for a basic (incomplete) app in which the web module depends on the Node.js module (presenting itself as “js-api”) and a little surprise at the end:

```
*mta.yaml x
1 ID: VerySimpleApp
2 _schema-version: '2.0'
3 description: I am a very simple app description
4 version: 0.0.1
5 modules: →
6 - name: db
7   type: hdb
8   path: db
9   requires:
10   ...
11   - name: hdi-container
12 -
13 - name: js
14   type: nodejs
15   path: js
16   provides:
17   ...
18   - name: js_api
19   properties:
20   ...
21   url: '${default-url}'
22 -
23 - name: web
24   type: html5
25   path: web
26   requires:
27   ...
28   - name: js_api
29 -
30 resources:
31 - name: hdi-container →
32   parameters:
33   ...
34   config:
35   ...
36   schema: DB_SCHEMA
37   properties:
38   ...
39   hdi-container-name: '${service-name}'
40   type: com.sap.xs.hdi-container
41
42
```

Very basic info about the app  
Here comes a list of the modules that comprise the app  
The web module has the js module as a dependency, so js will be deployed first  
where did you come from?

*This yaml is not taking some details (e.g., authentication) into account. We will go deeper into it as we progress.*

We have a surprised kitty and we cannot blame it. When you first create the MTA app and add the database module, that “hdi-container” and its parameters are added to the mta.yaml file automatically under “resources” (*go, take another look at it...*)

#### The mta.yaml file

In the first piece of the development descriptor file, you (the Web IDE, actually) added the modules that should be bound to each other and treated as a business app.

One of those modules is the “database” module. In here, and in this particular case, you will create a design-time artifact called “entity”, which will then become a runtime artifact called “table” (yes, the good ol’ table) and you will then cast some other Core Data Services spells.

You will also add data to those entities, access groups of tables created by another developer or even the schema that has been replicated onto HANA from your ECC system (that pretty BKPF table you will use in a Calculation View... you naughty).

That hdi-container is your own piece of database. It is what your database module will need to access it's own piece of HANA. It's your own piece of a backing service.

## Backing, Application and Mashup services

Why is the hdi-container there? Because you need to access the database (simple, huh?)

So do you just create a schema and hardcode some credentials for the other modules to access? Do you really think it's a good idea to give full access to the full database to a full developer? What would happen to all the isolation and independence and consequent robustness we've been fighting for?

No, my friends, we are not stopping here. You are getting your very own *piece* (instance) of database (a service) in the shape of a managed service. The database, the User Account and Authentication service, the job scheduler they are all **backing services**, the base layer that will serve different applications across different spaces.

Let that sink in the shape of an example. This is what some running services look like from the console:

name	service	plan	bound apps
HANA2-uaa	xsuaa	space	js, web
hdi-container	hana	hdi-shared	db2, js
XSA_DEV-jtocz9jmzxzpjico-VerySimpleApp-hdi-container	hana	hdi-shared	di-builder
shine-uaa	xsuaa	default	XSA_DEV-jtocz9jmzxzpjico-hana-shine-xsa-user-js, XSA_DEV-XSA_DEV-jtocz9jmzxzpjico-hana-shine-xsa-user-java, XSA_DE-
shine-user-container	hana	hdi-shared	di-builder, XSA_DEV-jtocz9jmzxzpjico-hana-shine-xsa-user-
shine-container	hana	hdi-shared	di-builder, XSA_DEV-jtocz9jmzxzpjico-hana-shine-xsa-core-
shine-scheduler	jobscheduler	default	XSA_DEV-jtocz9jmzxzpjico-hana-shine-xsa-user-js, XSA_DEV-
XSA_DEV-jtocz9jmzxzpjico-TECHED-hdi-container	hana	hdi-shared	di-builder, XSA_DEV-jtocz9jmzxzpjico-TECHED-js
XSA_DEV-jtocz9jmzxzpjico-AWS-hdi-container	hana	hdi-shared	di-builder
XSA_DEV-jtocz9jmzxzpjico-rabia-hdi-container	hana	hdi-shared	di-builder, XSA_DEV-jtocz9jmzxzpjico-rabia-js
XSA_DEV-jtocz9jmzxzpjico-AMAZON-hdi-container	hana	hdi-shared	di-builder
CROSS_SCHEMA_LOCATIONS	user-provided		
CROSS_SCHEMA_SYS	user-provided		
CROSS_SCHEMA_SYS_BI	user-provided		

## What am I looking at?

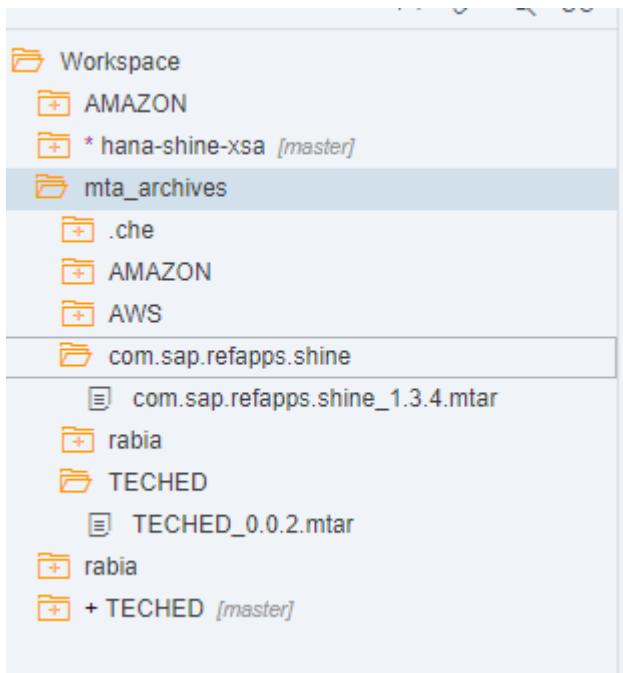
That is the list of services running, for example, in the "development" space (an environment in which resources are shared and can access each other).

You can see they have a **name**. Some of these are called as if somebody had appended a fit of rage on the keyboard between the User ID and the name of the application. It's not a fit of rage, it is an auto-generated id (and this is why computers do not perform creative tasks).

You can add your own predefined name as a parameter to the service to override this in the mta.yaml file, for example. I keep going back to mta.yaml so you understand how it orchestrates most of this.

The **plan** indicates the scope or level of resource or feature assigned to that resource. These will vary depending on the service. For example, the service plan for the “hana” service, for which you could use “schema” for a plain schema or “hdi-shared” for an HDI container (schema plus metadata). The plan is also associated to the type you declared in the descriptor.

When you right-click on the MTA app and click on **build**, the files are uploaded to the platform and the buildpacks are called to produce the executables. What is uploaded is an archive called “<<projectname>>.mtar” like the ones below:



*What happens when we move the .mtar file to the QA environment for testing?*

The backing services (again...database, UAA, etc.) are declared as resources to the application services, so the platform calls some elves, called service brokers, that will create a service instance for your specific application. The platform knows which service broker gets called thanks to the “type” (e.g., com.sap.xs.hdi-container) and the instances are made available. The **application services** are built on top of backing services.

Now that the backing services are provided and bound to the application services, the application can run.

```
hxeadm@hxexsa-sp02-lucia-vm:/usr/sap/HXE/HDB90> xs apps

Getting apps in org "HANAExpress" / space "development" as XSA_ADMIN...
Found apps:
  name      requested state  instances   memory     disk       urls
  di-builder  STARTED        1/1    256 MB  <unlimited> https://hxehost:51046
  db2         STOPPED        0/1    256 MB  <unlimited> <none>
  js          STARTED        1/1    1.00 GB <unlimited> https://hxehost:51051
  web         STARTED        1/1    1.00 GB <unlimited> https://hxehost:51049
```

Then come the **Mashup services**. They combine application services and expose a single point of entry, routing the requests it receives to the right service. An example of this is a Fiori interface, a service whose tiles call other services. The other most pure example of this is the application router, which is necessary for your MTA application to have a single entry point too. Routes are a key concept itself and it is explored in the next blog (coming soon).

**Wait! Before you leave...** I would say it's high time you experimented all of this yourself if you haven't already. Now that [XS Advanced is easily available in different cloud providers](#) for SAP HANA, express edition, you can follow the introductory step-by-step tutorials here <https://www.sap.com/developer/groups/hana-xsa-get-started.html>

The screenshot shows a dark-themed landing page for a tutorial. On the left, there's a graphic of a yellow gear next to three black cylinders representing databases. The title 'Build a basic SAP HANA XS Advanced application' is centered in blue text. To the right, a timer icon indicates '1 hr.' Below the title, the word 'Beginner' is written in orange. A detailed description follows: 'These tutorials will guide you through the initial steps to set up a Multi-Target Application (MTA) in XS Advanced, using a Git repository, creating an HTML5 module, a HANA Deployment Infrastructure (HDI) module and exposing XSJS and OData services.' At the bottom left, there's a tag icon followed by the text 'SAP Web IDE, SAP HANA'. On the right side, there are social sharing icons for Facebook, Google+, Twitter, LinkedIn, and Email.

- 
- A vertical sequence of four numbered circles (1, 2, 3, 4) connected by lines, each with a corresponding step description:
- 1 SAP HANA XS Advanced, Connecting to SAP Web IDE and cloning a Git Repository to begin development
  - 2 SAP HANA XS Advanced, Creating an HTML5 Module
  - 3 SAP HANA XS Advanced, Creating an HDI Module
  - 4 SAP HANA XS Advanced, Creating a Node.js Module

As always, I'd like to stay in touch on [Twitter or on LinkedIn !](#) and if you are lucky enough to be going to SAP TechEd, we will be building an XS Advanced app [and other cool stuff at the App Space](#).

Want to learn more? Go into the last piece of these series and [get introduced to the routing concepts](#).

# GITHUB XSA WEBIDE integration

Wednesday, August 10, 2022 1:02 PM

Hi Hari,

I would like to update you that your ticket has reached the team responsible for GIT experience in Web IDE. I have 2 comments regarding the issue you have:

1. As you can see in the document you have provided in the first screen shot, Github advises to create at least READ.ME file in order that the repository will not be empty and it would be possible to clone it. Could you please ensure that?

2. Regarding the authentication error, Github requires you to use Personal Access Token and not your password as it documented here: <https://docs.github.com/en/repositories/creating-and-managing-repositories/troubleshooting-cloning-errors#provide-an-access-token>

Could you please follow the guidelines, create Personal Access Token and try to clone the repository using it?

Let me know how it goes.

Regards,  
Rima

From <<https://launchpad.support.sap.com/#/incident/pointer/00207512950001538842022>>

- 1) Always add a READ.ME document to the repository
- 2) Use personal access token generated in Github account to download the code  
<https://docs.github.com/en/repositories/creating-and-managing-repositories/troubleshooting-cloning-errors#provide-an-access-token>

# Creating a personal access token - GitHub Docs

Wednesday, August 10, 2022 1:03 PM

Clipped from: <https://docs.github.com/en/authentication/keeping-your-account-and-data-secure/creating-a-personal-access-token>



All products

Authentication

Account security

Authentication to GitHub

Create a strong password

Update access credentials

## Create a PAT

Reviewing your SSH keys

Deploy keys

Authorizing OAuth Apps

Authorizing GitHub Apps

Authorized integrations

Third-party applications

Review OAuth apps

Token expiration

Security log

Remove sensitive data

About anonymized URLs

GitHub's IP addresses

SSH key fingerprints

Sudo mode

Unauthorized access

Secure your account with 2FA

Connect with SSH

Troubleshooting SSH

Verify commit signatures

Troubleshoot verification

Authentication / Create a PAT

Free, Pro, & Team ▾

English ▾

Search GitHub Docs

# Creating a personal access token

## In this article

- [Creating a token](#)
- [Using a token on the command line](#)
- [Further reading](#)

You can create a personal access token to use in place of a password with the command line or with the API.

### Notes:

- If you use GitHub CLI to authenticate to GitHub on the command line, you can skip generating a personal access token and authenticate via the web browser instead. For more information about authenticating with GitHub CLI, see [gh auth login](#).
- [Git Credential Manager](#) is a secure, cross-platform alternative to using personal access tokens (PATs) and eliminates the need to manage PAT scope and expiration. For installation instructions, see [Download and install](#) in the `GitCredentialManager/git-credential-manager` repository.

Personal access tokens (PATs) are an alternative to using passwords for authentication to GitHub when using the [GitHub API](#) or the [command line](#).

If you want to use a PAT to access resources owned by an organization that uses SAML SSO, you must authorize the PAT. For more information, see "[About authentication with SAML single sign-on](#)" and "[Authorizing a personal access token for use with SAML single sign-on](#)" in the GitHub Enterprise Cloud documentation.

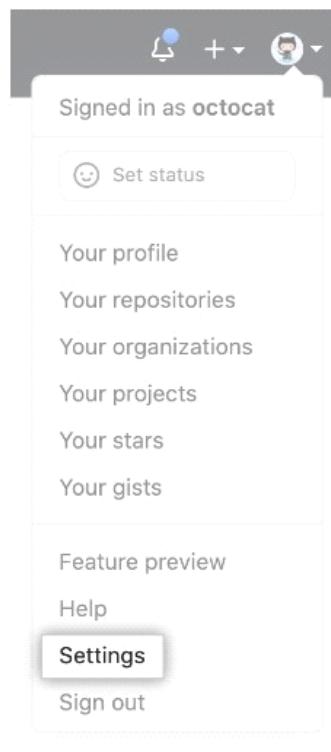
As a security precaution, GitHub automatically removes personal access tokens that haven't been used in a year. To provide additional security, we highly recommend adding an expiration to your personal access tokens.

A token with no assigned scopes can only access public information. To use your token to access repositories from the command line, select `repo`. For more information, see "[Available scopes](#)".

## Creating a token

- ➊ [Verify your email address](#), if it hasn't been verified yet.
- ➋ In the upper-right corner of any page, click your profile photo, then click [Settings](#).

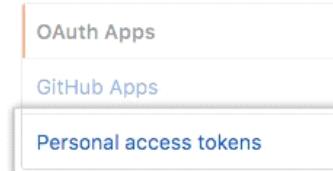
- 2 In the upper-right corner of any page, click your profile photo, then click **Settings**.



- 3 In the left sidebar, click **<> Developer settings**.

- 4 In the left sidebar, click **Personal access tokens**.

Settings / Developer settings



- 5 Click **Generate new token**.

Personal access tokens

[Generate new token](#)

- 6 Give your token a descriptive name.

**Note**

What's this token for?

WHAT'S THIS TOKEN FOR?

- 7 To give your token an expiration, select the **Expiration** drop-down menu, then click a default or use the calendar picker.

### Expiration

7 days

The token will expire on Friday, Feb 8 2008

- 8 Select the scopes, or permissions, you'd like to grant this token. To use your token to access repositories from the command line, select **repo**.

<input checked="" type="checkbox"/> <b>repo</b>	Full control of private repositories
<input type="checkbox"/> <code>repo:status</code>	Access commit status
<input type="checkbox"/> <code>repo_deployment</code>	Access deployment status
<input type="checkbox"/> <code>public_repo</code>	Access public repositories
<input type="checkbox"/> <b>admin:org</b>	Full control of orgs and teams
<input type="checkbox"/> <code>write:org</code>	Read and write org and team membership
<input type="checkbox"/> <code>read:org</code>	Read org and team membership
<input type="checkbox"/> <b>admin:public_key</b>	Full control of user public keys
<input type="checkbox"/> <code>write:public_key</code>	Write user public keys
<input type="checkbox"/> <code>read:public_key</code>	Read user public keys
<input type="checkbox"/> <b>admin:repo_hook</b>	Full control of repository hooks
<input type="checkbox"/> <code>write:repo_hook</code>	Write repository hooks
<input type="checkbox"/> <code>read:repo_hook</code>	Read repository hooks
<input type="checkbox"/> <b>admin:org_hook</b>	Full control of organization hooks
<input type="checkbox"/> <b>gist</b>	Create gists
<input type="checkbox"/> <b>notifications</b>	Access notifications
<input type="checkbox"/> <b>user</b>	Update all user data
<input type="checkbox"/> <code>user:email</code>	Access user email addresses (read-only)
<input type="checkbox"/> <code>user:follow</code>	Follow and unfollow users
<input type="checkbox"/> <b>delete_repo</b>	Delete repositories

- 9 Click **Generate token**.

<input type="checkbox"/> <code>write:gpg_key</code>	Write user gpg keys
<input type="checkbox"/> <code>read:gpg_key</code>	Read user gpg keys
<b>Generate token</b>	<b>Cancel</b>

Tokens you have generated that can be used to access the GitHub API.

Make sure to copy your new personal access token now. You won't be able to see it again!

✓ `ghp_IqIMNOZH6z0wIEB4T9A2g4EHMy8J142q4HAS` 

Enable SSO

Delete

**Warning:** Treat your tokens like passwords and keep them secret. When working with the API, use tokens as environment variables instead of hardcoding them into your programs.

- 10 To use your token to authenticate to an organization that uses SAML single sign-on, authorize the token. For more information, see "[Authorizing a personal access token for use with SAML single sign-on](#)" in the GitHub Enterprise Cloud documentation.

## Using a token on the command line

Once you have a token, you can enter it instead of your password when performing Git operations over HTTPS.

For example, on the command line you would enter the following:

```
$ git clone https://github.com/username/repo.git
Username: your_username
Password: your_token
```

Personal access tokens can only be used for HTTPS Git operations. If your repository uses an SSH remote URL, you will need to [switch the remote from SSH to HTTPS](#).

If you are not prompted for your username and password, your credentials may be cached on your computer. You can [update your credentials in the Keychain](#) to replace your old password with the token.

Instead of manually entering your PAT for every HTTPS Git operation, you can cache your PAT with a Git client. Git will temporarily store your credentials in memory until an expiry interval has passed. You can also store the token in a plain text file that Git can read before every request. For more information, see "[Caching your GitHub credentials in Git](#)."

## Further reading

- ["About authentication to GitHub"](#)
- ["Token expiration and revocation"](#)

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# How to find ECC table for a give aDSO BW

Thursday, September 15, 2022 10:53 AM



how to find  
ECC table ...

# Block anonymous access to API in NODEJS without

Tuesday, January 3, 2023 4:44 PM

The screenshot shows the SAP WebIDE interface with the URL <https://webide.sapuxhbd.tcc.etn.com:30033/watt/index.html?workspaceId=workspacem2tqscrcvu853o4k>. The left sidebar displays a project structure for a Node.js application named 'BOMNilesh'. The 'server.js' file is selected and open in the main editor. The code snippet is as follows:

```
3
4 var xsjs = require("@sap/xsjs");
5 var xsenv = require("@sap/xsenv");
6 var port = process.env.PORT || 3000;
7
8 var options = {
9   anonymous : true, // remove to authenticate calls
10  auditLog : { logToConsole : true }, // change to auditlog service for productive scenarios
11  redirectUrl : "/index.xsjs"
12 };
13
14 // configure HANA
15 try {
16   options = Object.assign(options, xsenv.getServices());
17 } catch (err) {
18   console.log("[WARN]", err.message);
19 }
20
21 // configure UAA
22 try {
23   options = Object.assign(options, xsenv.getServices({ uaa: { tag: "xsuaa" } }));
24 } catch (err) {
25   console.log("[WARN]", err.message);
26 }
27
28 // start server
29 xsjs(options).listen(port);
30
31 console.log("Server listening on port %d", port);
32
```

A red box highlights the line `anonymous : true` in the options object. A red callout bubble points to this line with the text "to block access to API in NODEJS".

# 2841512 - How to: Import predefined SQL script to HANA studio or HANA cockpit. - SAP for Me

Tuesday, May 9, 2023 9:28 AM

Clipped from: <https://me.sap.com/notes/2841512>

## Symptom

You want to import predefined SQL script to HANA studio or HANA cockpit for monitoring purposes.

*"Image/data in this KBA is from SAP internal systems, sample data, or demo systems. Any resemblance to real data is purely coincidental."*

## Environment

- HANA Studio
- HANA Cockpit

## Resolution

### • HANA Studio:

1. In the Administration editor, choose the System Information tab.

The SQL statements delivered with SAP HANA are displayed in the System folder.

Name	Description
> System	Predefined system statements

1. Create folders for organizing your statements as required:

1. From the context menu, choose New Folder.
2. Enter the name and description of the folder.

Name	Description
> System	Predefined system statements

- New Folder
- New SQL Statement
- Import SQL Statements
- Configure Table...

1. Add user-defined statements by creating them directly or importing them from file:

Filter: 

The screenshot shows a catalog browser interface. On the left, there's a tree view with 'System' expanded, showing a folder named 'test'. To the right, there's a detailed view of the 'test' folder with the description 'Predefined system statements'. A context menu is open over the 'test' folder, listing options: 'New Folder', 'New SQL Statement', 'Import SQL Statements' (which is highlighted in blue), 'Delete', 'Rename', and 'Configure Table...'. The 'Delete' option has a keyboard shortcut 'F2' next to it.

1. Save the Administration editor.

The list of statements on the System Information tab is saved to the XML file configured in the preferences.

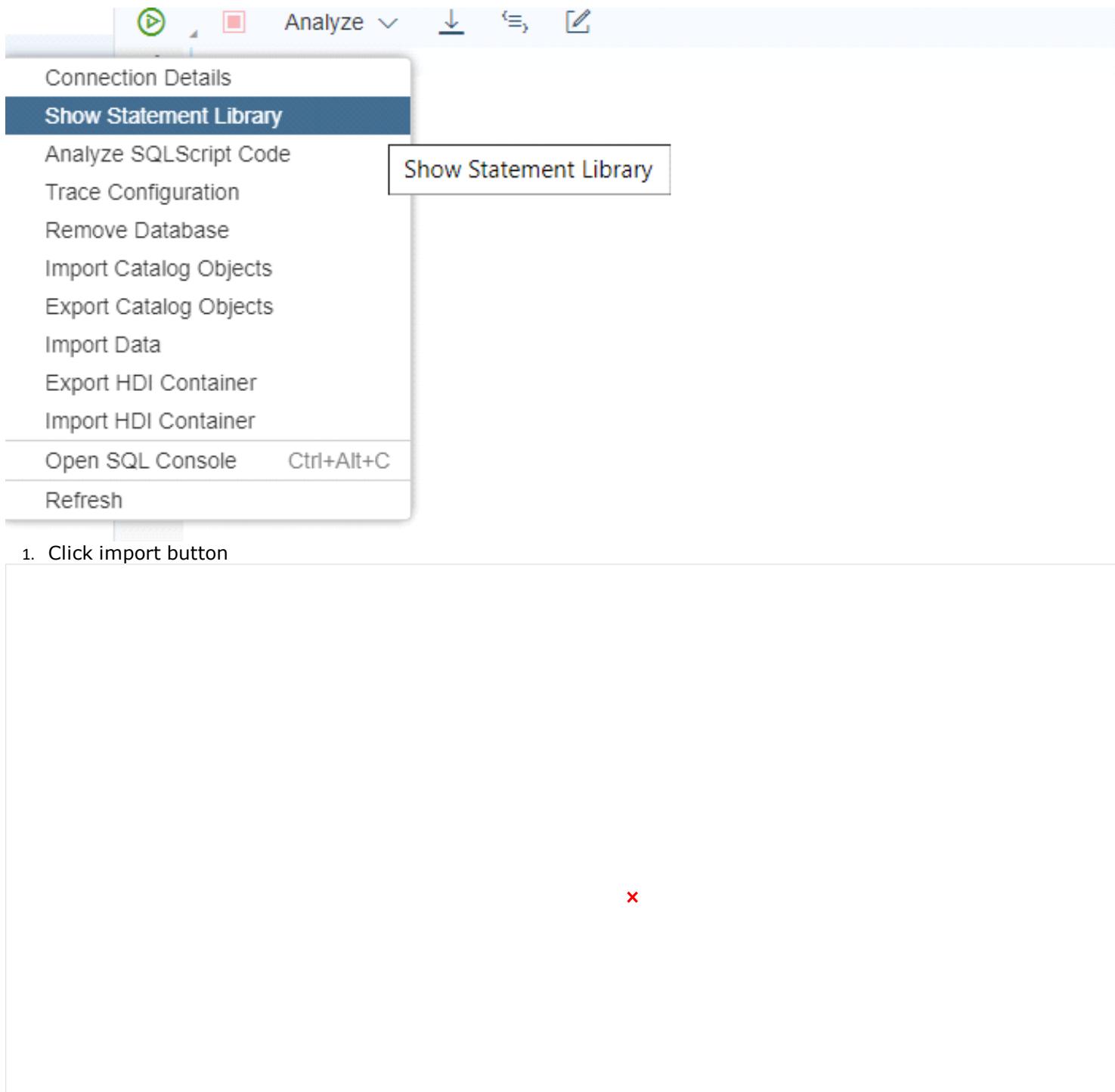
For more details, you can refer to HANA Adminstration guide: [Use User-Defined SQL Statements for System Monitoring](#)

- **HANA Cockpit:**

1. In the catalog browser, right-click your database and click Open SQL Console.

The screenshot shows the SAP HANA Cockpit interface. At the top, there's a navigation bar with 'System Overview' selected. Below the navigation bar, there are two buttons: 'Open SQL Console' with a magnifying glass icon and 'Manage Databases' with a circular arrow icon.

1. Right-click on your database and choose show statement library



For more details, you can refer to HANA Administration guide: [Use the Statement Library to Administer Your Database](#)

#### See Also

[1969700 - SQL Statement Collection for SAP HANA](#)

#### Keywords

Import SQL scripts; HANA Studio; HANA Cockpit; SQL Statement Collection for HANA;

# How to find HANA disk size,memory size,record count, memory usage of COLUMN TABLES in HANA | SAP Blogs

Wednesday, August 30, 2023 3:37 PM

Clipped from: <https://blogs.sap.com/2020/09/21/how-to-find-hana-disk-size-memory-size-record-count-memory-usage-in-hana/>

Simple but Important commands in HANA DB on M\_TABLE\_PERSISTENCE\_STATISTICS Vs M\_TABLES Vs M\_CS\_TABLES

## A.Different use cases of using M\_TABLE\_PERSISTENCE\_STATISTICS

1.Wanted to find the disk size of your HANA DB

```
select sum((disk_size)/1024/1024/1024) from  
m_table_persistence_statistics;
```

NOTE: Below output is in GB.

SUM((DISK_SIZE)/1024/1024/1024)	
1	22,951.8467040583077905

2.Wanted to find the disk size of a specific table in HANA DB. ( You can either use this query or also use studio-catalog->display->runtime information) . Below we are trying to find the list of table name and its disk size with format /BIC/B\*

```
select TABLE_NAME, DISK_SIZE from M_TABLE_PERSISTENCE_STATISTICS  
where SCHEMA_NAME = 'SAPSSS' and TABLE_NAME like '/BIC/B%' order by  
DISK_SIZE desc
```

TABLE_NAME	DISK_SIZE
1 /BIC/B000	90,337,935,360
2 /BIC/B00C	85,534,457,856
3 /BIC/B00	55,158,779,904
4 /BIC/B00C	43,179,081,728
5 /BIC/B00	34,701,312,000
6 /BIC/B00C	32,342,069,248
7 /BIC/B00G	29,623,771,136
8 /BIC/B00C	27,598,725,120
9 /BIC/B01	27,161,190,400

3.Other use cases can be like using size for specific schema.

## B.Different use cases of using M\_TABLES

1.Wanted to find RECORD\_COUNT of any specific table along with disk size:

```
select * from M_TABLES where TABLE_NAME = 'CDPOS' and SCHEMA_NAME='SAPEDS';
```

SCHEMA_NAME	TABLE_NAME	RECORD_COUNT	TABLE_SIZE	IS_COLUMN_TABLE	TABLE_TYPE	IS_PARTITIONED	IS_REPLICATED
1 SAI ..	C	14,687,777,616	1,321,011,141,782	TRUE	COLUMN	TRUE	FALSE

2.Wanted to find out disk size occupied by specific schema:

```
select distinct schema_name,sum((disk_size)/1024/1024/1024) as disk_GB from m_table_persistence_statistics group by schema_name,disk_size order by disk_GB;
```

DISK_GB
1 5,014.59

### C.Different use cases of M\_CS\_TABLES with respect to memory consumption.

**NOTE:** The memory usage in M\_CS\_TABLES are real time memory usage and it can vary time to time as either a column store table can be loaded fully, partially or not loaded at all.

Tables that are not currently in memory will have memory usage as -1. If you want to have more details on how to unload and load tables fully and partially , check out by below blog.

How to perform manual Load and unload of column store tables in HANA  
<https://blogs.sap.com/2020/09/12/how-to-perform-manual-load-and-unload-of-column-store-tables-in-hana/>

#### HANA store LOADS and UNLOADS

<https://blogs.sap.com/2020/09/11/hana-column-store-load-and-unloads-and-sqls>

1.Wanted to find the memory usage of any specific table (partitioned or non-partitioned)

```
select * from M_CS_TABLES where TABLE_NAME='CDPOS' and SCHEMA_NAME='SAPSSS';
```

SQL Result

```
select * from M_CS_TABLES where TABLE_NAME='CDPOS' and SCHEMA_NAME='SAP'
```

HOST	PORT	SCHEMA_NAME	TABLE_NAME	PART_ID	MEMORY_SIZE_IN_TOTAL	MEMORY_SIZE_IN_MAIN	MEMORY_SIZE_IN_DELTA	MEMORY_SIZE_IN_HISTORY_MAIN	MEMO
1		SAP	CDPOS	6	60,896,593,935	60,546,694,137	349,899,796		0
2		SAP	CDPOS	12	62,102,600,402	61,751,033,818	351,566,584		0
3		SAP	CDPOS	1	62,118,043,370	61,759,320,808	358,722,562		0
4		SAP	CDPOS	2	62,096,930,446	61,753,379,010	343,551,436		0
5		SAP	CDPOS	16	60,897,573,526	60,546,693,826	350,879,700		0
6		SAP	CDPOS	9	64,556,194,596	64,204,735,248	351,459,348		0
7		SAP	CDPOS	14	60,894,665,415	60,543,773,245	350,892,170		0
8		SAP	CDPOS	19	37,618,856,354	37,239,659,268	379,197,086		0
9		SAP	CDPOS	20	38,517,939,029	38,167,790,933	350,148,096		0
10		SAP	CDPOS	13	62,063,928,800	61,770,938,256	292,990,344		0
11		SAP	CDPOS	15	60,846,050,770	60,571,428,102	274,622,668		0
12		SAP	CDPOS	21	62,094,736,613	61,772,810,473	321,926,140		0
13		SAP	CDPOS	3	60,445,982,677	60,104,010,053	341,972,624		0
14		SAP	CDPOS	4	60,045,863,775	60,045,863,775	251,347,870		0

2.Wanted to find the total memory consumption by column store tables in HANA DB:

```
select sum(memory_size_in_total) from M_CS_TABLES;
```

Note: Below output is in bytes. To get in GB use below.

```
select sum(memory_size_in_total)/1024/1024/1024 from M_CS_TABLES;
```

SQL Result

```
select sum(MEMORY_SIZE_IN_TOTAL) from M_CS_TABLES
```

SUM(MEMORY_SIZE_IN_TOTAL)
13,559,190,272,925

3.Wanted to find out the delta memory usage and main memory usage of any specific table ?

```
select sum(memory_size_in_total)/1024/1024/1024 as TotalMemGB,sum(memory_size_in_main)/1024/1024/1024 as TotalMain,sum(memory_size_in_delta)/1024/1024/1024 as TotalDelta from M_CS_TABLES where TABLE_NAME='CDPOS' and SCHEMA_NAME='SAPSSS';
```

SQL Result

```
select sum(memory_size_in_total)/1024/1024/1024 as TotalMemGB,sum(memory_size_in_main)/1024/1024/1024 as TotalMain,sum(memory_size_in_delta)/1024/1024/1024 as TotalDelta from M_CS_TABLES where TABLE_NAME='CDPOS' and SCHEMA_NAME='SAP'
```

	TOTALMEMGB	TOTALMAIN	TOTALDELTA
1	951.3719951976089453	944.6704946421079589	6.7015005555000292

4.Wanted to find out host level memory consumption in your scale out node.

```
select host, count(*), round(sum(memory_size_in_total)/1024/1024/1024)) as size_GB from m_cs_tables group by host order by host
```

```
select host, count(*), round(sum(memory_size_in_total/1024/
```

HOST	COUNT(*)	SIZE_GB
1	22,077	518
2	7,574	772
3	6,801	1,245
4	7,272	1,446
5	7,530	1,478
6	6,289	491
7	5,559	1,305
8	6,680	1,468
9	359	1,140
10	322	1,205

5.Wanted to find out list of top most memory consumer table in HANA DB?

Here I wish to find out the list of tables which consumes more than 100 GB

with CST AS (

```
select
SCHEMA_NAME, TABLE_NAME, ROUND(SUM(MEMORY_SIZE_IN_TOTAL/1024/
1024/1024)) as memGB
from M_CS_TABLES
group by SCHEMA_NAME, TABLE_name)
select * from CST
where memGB > 100
order by memGB desc
```

```
with CST AS (
  select SCHEMA_NAME, TABLE_NAME, ROUND(SUM(MEMORY_SIZE_IN_TOTAL/1024/1024/1024)) as memGB
  from M_CS_TABLES
  where SCHEMA_NAME = 'CDPOS'
  )
  SCHEMA_NAME TABLE_NAME MEMGB
  1 CDPOS 1,228
  2 KONV 692
  3 [REDACTED] 502
  4 [REDACTED] 410
  5 [REDACTED] 287
  6 [REDACTED] 212
  7 [REDACTED] 207
  8 [REDACTED] 204
  9 [REDACTED] 198
  10 [REDACTED] 198
  11 [REDACTED] 177
  12 [REDACTED] 175
  13 [REDACTED] 170
  14 [REDACTED] 155
  15 [REDACTED] 170
successfully executed in 3.789 seconds (server processing time: 3.789 seconds)
Fetches 21 row(s) in 0 ms 52 us (server processing time: 0 ms 0 us)
```

Please do keep me posted if you find any new important use cases on these tables.

Thanks for reading!

Follow for more such posts by clicking here and FOLLOW : [Rajarajeswari Kaliyaperumal](#)

Like and leave a comment or suggestion if any!

# Check HANA Database Table Size using HANA Studio

Thursday, August 31, 2023 2:16 PM

Clipped from: <https://www.kodyaz.com/sap-abap/check-table-size-on-hana-database-using-hana-studio.aspx>



## SAP ABAP Programming and HANA Database Tutorials

Development resources, articles, tutorials, code samples, tools and downloads for SAP HANA and ABAP, HANA Database, SQLScript, SAP UI5, Screen Personas, Web Dynpro, Workflow

Kodyaz.com

Articles

SQL Server

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AWS

Data Virtualization

Javascript

Windows

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Exasol

Purple Place

SAP HANA and ABAP

# Check HANA

SAP Tutorials

Install SAP Free

## Database Table Size using HANA Studio

SAP Tutorials

CRM Companies List

SAP Tools

Web Based CRM

SAP Transaction Codes

Software

Table

SAP HANA database administrator or SQLScript developers can use SAP HANA Studio to check database table sizes on disk to see how much disk space each SAP table uses. Disk space used by each SAP table can be viewed by using HANA Studio Administration cockpit visually or using SQL Console by querying M\_TABLE\_PERSISTENCE\_STATISTICS monitoring table.

Meetup Sunumu [Meetup](#)

Using SAP HANA Development perspective, using Systems tab find your SAP HANA database system from the list.

SAP HANA Development

Right click on the target SAP HANA database using System window in SAP HANA Studio  
Using the context menu, follow options Configuration and Monitoring > Open Administration

## Configuration and Monitoring > Open Administration



Administration cockpit will provide SAP HANA Studio users a huge amount of data about the HANA database that the SAP system is running on.

Switch to **System Information** tab.

A list tools or HANA database applications will be listed as in below screenshot.

SAP HANA Studio users can use the **Size of Tables on Disk** tool which enables developers to see the size of HANA database tables on disk in bytes.

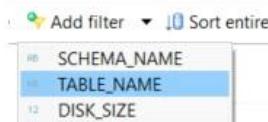
A screenshot of the SAP HANA Studio 'System Information' tab. The tab bar at the top includes 'Overview', 'Landscape', 'Alerts', 'Performance', 'Volumes', 'Configuration', 'System Information' (which is selected and highlighted in blue), 'Diagnosis Files', and 'Trace Co'. Below the tabs is a 'Filter:' input field. The main area is a table with two columns: 'Name' and 'Description'. The 'Name' column lists various monitoring tools, many of which have small icons next to them. The 'Size of Tables on Disk' tool is highlighted with a light blue selection bar. A tooltip for this tool states: 'Shows the size of tables on disk in bytes'. Other visible tools include 'Backup Catalog', 'Blocked Transactions', 'Caches', 'Component Memory Usage', 'Connection Attempts and Status', 'Connections', 'Connection Statistics', 'Database Information', 'Delta Merge Analysis', 'Expensive Statements Analysis', 'Failed Backups', 'Lock Waiting History', 'Merge Statistics', 'MVCC Blocker Connection', 'MVCC Blocker Statement', 'MVCC Blocker Transaction', 'Open Transactions', 'Overall Workload', 'Record Locks', 'Schema Size of Loaded Tables', 'Session Context', 'Sessions', 'Table Locks', 'Transactions', and 'Used Memory by Tables'.

Name	Description
System	Predefined system statements
Backup Catalog	Backup catalog - Shows most recent data and log backups
Blocked Transactions	Shows a list of transactions waiting for a record lock
Caches	Shows caches
Component Memory Usage	Shows memory consumption of components
Connection Attempts and Status	Shows connection attempts and status
Connections	Shows a list of connections
Connection Statistics	Shows connection statistics including network I/O
Database Information	Basic configuration of the database
Delta Merge Analysis	Detailed information about the Delta Merge
Expensive Statements Analysis	Shows a quick analysis over the recorded Expensive Statements
Failed Backups	Backup catalog - Shows failed data and log backups
Lock Waiting History	Shows summary of occurred lock waits
Merge Statistics	Shows merge statistics
MVCC Blocker Connection	Shows connection which is blocking the garbage collection
MVCC Blocker Statement	Shows statements which might be blocking the garbage collection
MVCC Blocker Transaction	Shows transaction which is blocking the garbage collection
Open Transactions	Shows a list of open transactions
Overall Workload	Shows current workload
Record Locks	Shows record locks
Schema Size of Loaded Tables	Shows memory consumption of schemas (loaded tables) in megabyte
Session Context	Shows session context information
Sessions	Shows details about sessions and their resource consumption
Size of Tables on Disk	Shows the size of tables on disk in bytes
Table Locks	Shows table locks
Transactions	Shows a list of transactions
Used Memory by Tables	Shows total memory consumption of all column and row tables

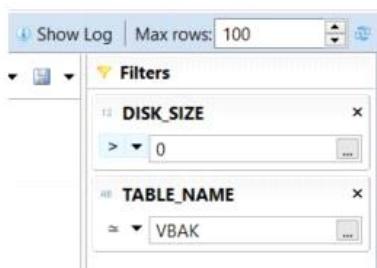
Double click on the **Size of Tables on Disk** tool for default use.

default use.

Using **Add filter** button, SAP HANA Studio users can add filters like table disk size, table name or schema name to minimize the list of tables you are dealing with on the return list.



The filter criteria will be visible on the **Filters** section.



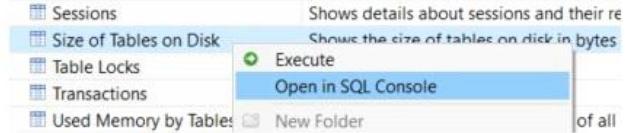
When you run the query to list the SAP HANA database tables and their disk sizes, a result set similar to below will be displayed. Please note that the size column value is in bytes.

Shows the size of tables on disk in bytes		
Raw Data	Distinct values	
<b>Filter part</b> 7 rows retrieved - 3 sec, 492 ms <input checked="" type="radio"/> Execute <input type="radio"/> Add filter <input type="radio"/> Sort entire data set		
SCHEMA_NAME	TABLE_NAME	DISK_SIZE
SAPABAP1	VSVBAK_CN	69.632
SAPABAP1	VBAK_DAAG_CUST	12.288
SAPABAP1	VBAK	1.314.816
SAPABAP1	TXW_S_VBAK	16.384
SAPABAP1	TKKVBAKT	12.288
SAPABAP1	SDXTST_VBAK	12.288
SAPABAP1	PRSD_VBAK_EXT	12.288

Of course, if you are an experienced SQL programmer it is an option to type your query for additional information on the System Information tool.

On the Administration cockpit, instead of double click on the "Size of Tables on Disk" or Execute the tool immediately, right click on from context menu choose





Here is the default SQLScript query for displaying SAP HANA database table sizes on disks  
Of course, SQL developer can use other fields from **M\_TABLE\_PERSISTENCE\_STATISTICS** like page\_count, read\_count, write\_count, bytes\_read, etc. by modifying your SQL query

---

```
SELECT
  SCHEMA_NAME, TABLE_NAME, DISK_SIZE
FROM
  PUBLIC.M_TABLE_PERSISTENCE_STATISTICS
ORDER BY
  DISK_SIZE DESC
```

---

Code

---

```
SQL
1 SELECT
2   SCHEMA_NAME, TABLE_NAME, DISK_SIZE
3 FROM
4   PUBLIC.M_TABLE_PERSISTENCE_STATISTICS
5 ORDER BY
6   DISK_SIZE DESC
```

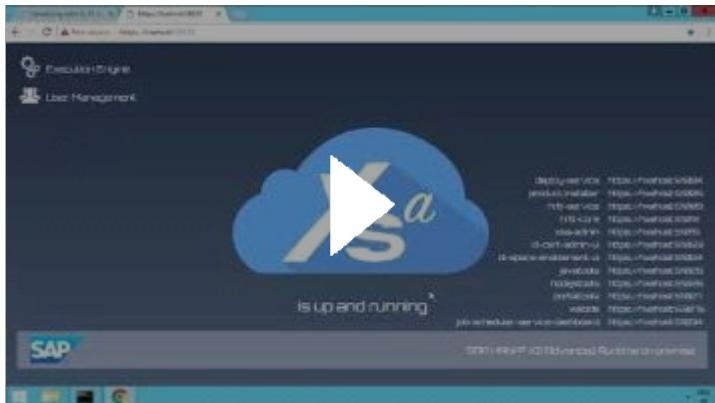
---

Copyright © 2004 - 2021 Eralper YILMAZ. All rights reserved.

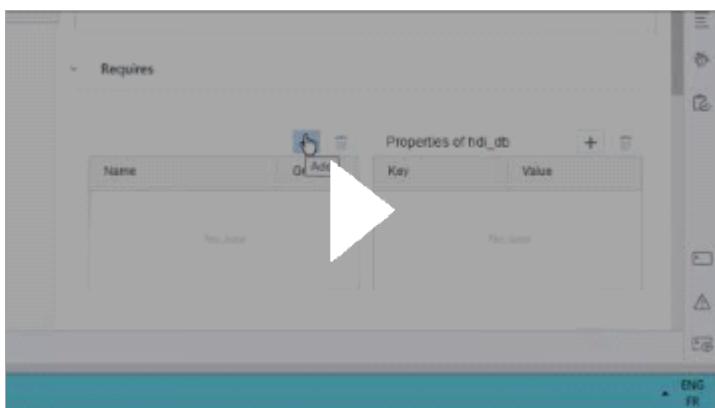
# Job scheduling

Thursday, September 21, 2023 6:52 PM

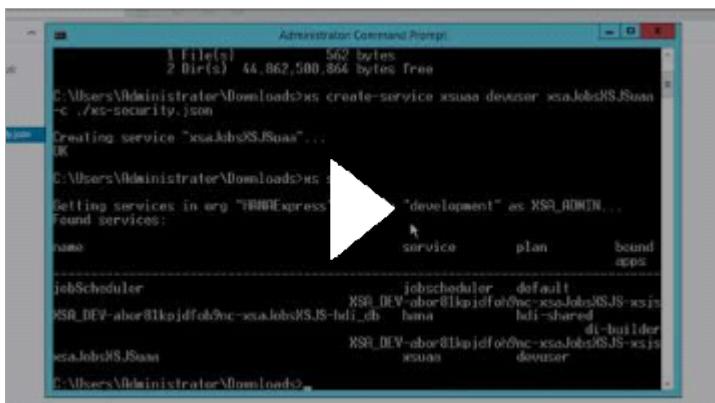
## [SAP HANA Academy - Job Scheduler - Introduction \[2.0 SPS 02\]](#)



## [SAP HANA Academy - Job Scheduler - XSJS \[2.0 SPS 02\]](#)



## [SAP HANA Academy - Job Scheduler - XSJS with Authentication \[2.0 SPS 02\]](#)



## Related help links

Friday, September 22, 2023 11:26 AM

<a href="https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/4de4ea4f04ea460cbccb7d97c78e7183.html?locale=en-usversion%3D2.0.00">https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/4de4ea4f04ea460cbccb7d97c78e7183.html?locale=en-usversion%3D2.0.00</a>	Scheduling Jobs in XS Advanced	
<a href="https://blogs.sap.com/2018/02/19/using-the-job-scheduler-in-xs-advanced/">https://blogs.sap.com/2018/02/19/using-the-job-scheduler-in-xs-advanced/</a>	<b>Using the Job Scheduler in XS Advanced</b>  From < <a href="https://blogs.sap.com/2018/02/19/using-the-job-scheduler-in-xs-advanced/">https://blogs.sap.com/2018/02/19/using-the-job-scheduler-in-xs-advanced/</a> >	
<a href="https://github.com/saphanaacademy/xsaJobsXSJS">https://github.com/saphanaacademy/xsaJobsXSJS</a>	<b>Git hub code example</b>	
<a href="https://jobscheduler-dashboard.sapuxhbd.tcc.etn.com:30033/index.html">https://jobscheduler-dashboard.sapuxhbd.tcc.etn.com:30033/index.html</a>		
<a href="https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/d471f9803bcba4479845d17be0519ce4a.html?locale=en-usversion%3D2.0.00">https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/d471f9803bcba4479845d17be0519ce4a.html?locale=en-usversion%3D2.0.00</a>	<b>The Job Scheduler Dashboard</b>  From < <a href="https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/d471f9803bcba4479845d17be0519ce4a.html?locale=en-usversion%3D2.0.00">https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/d471f9803bcba4479845d17be0519ce4a.html?locale=en-usversion%3D2.0.00</a> >	
	<b>Scheduling Jobs in XS Advanced</b>  From < <a href="https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/4de4ea4f04ea460cbccb7d97c78e7183.html?locale=en-usversion%3D2.0.00">https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/4de4ea4f04ea460cbccb7d97c78e7183.html?locale=en-usversion%3D2.0.00</a> >	

Activate these services

The screenshot shows the SAP HANA Academy - Job Scheduler - Introduction [2.0 SPS 02] interface. The top navigation bar includes a back arrow, forward arrow, a refresh icon, and a warning message 'Not secure' followed by the URL 'https://hxhost:51015/index.html'. The main content area is titled 'XS Advanced Administration'. It features a grid of six service tiles:

- Application Monitor**: Represented by a yellow square with a hand cursor icon and a chart icon.
- Organization and Space Management**: Represented by a white square with a server icon.
- Application Role Builder**: Represented by a white square with a user icon.
- SAML Identity Provider Configuration**: Represented by a white square with a gear icon.
- User Management**: Represented by a white square with a user icon.
- SAP HANA Logical Database Setup**: Represented by a white square with a gear icon.

Below the grid, there are three additional service tiles:

- SAP HANA Service Broker Configuration**: Represented by a white square with a gear icon.
- Host Management**: Represented by a white square with a server icon.
- Trusted Certificates**: Represented by a white square with a gear icon.

At the bottom left of the main content area, there is a link labeled 'XS Advanced Audit Logs'.

SAP XS Advanced Administration Application Monitor

Service	Description	URL	Logs	Action
jobscheduler-db	HANAExpress   SAP			▶ ⏺ ⏹ ⏷ ⏸
jobscheduler-rest	HANAExpress   SAP			▶ ⏺ ⏹ ⏷ ⏸
jobscheduler-service	HANAExpress   SAP			▶ ⏺ ⏹ ⏷ ⏸
jobscheduler-backend	HANAExpress   SAP			▶ ⏺ ⏹ ⏷ ⏸
jobscheduler-dashboard	HANAExpress   SAP			▶ ⏺ ⏹ ⏷ ⏸

I activated jobscheduler-db service

SAP HANA XS Advanced Cockpit

Status	Service	Instances	Memory	Action
Started	hrtt-sapui5	1/1	Unlimited	256 MB
Started	hrtt-service	1/1	Unlimited	512 MB
Started	jobscheduler-backend	1/1	Unlimited	256 MB
Started	jobscheduler-broker	1/1	Unlimited	256 MB
Started	jobscheduler-dashboard	1/1	Unlimited	256 MB
Started	jobscheduler-db	0/1	Unlimited	256 MB
Started	jobscheduler-rest	1/1	Unlimited	256 MB
Started	jobscheduler-service	1/1	Unlimited	512 MB

## Namespace: trace

Thursday, September 28, 2023 5:36 PM

Clipped from:

[https://help.sap.com/doc/3de842783af24336b6305a3c0223a369/2.0.03/en-US/\\$.trace.html](https://help.sap.com/doc/3de842783af24336b6305a3c0223a369/2.0.03/en-US/$.trace.html)**Namespace: trace****\$. trace**

Namespace: trace

**Methods****<static> debug(message)**Writes the given message with the trace-level **debug** to the application trace file**Parameters:**

Name	Type	Description
message	string	The message to be written to trace

**Throws:**

Throws an error if message is missing.

**<static> error(message)**Writes the given message with the trace-level **error** to the application trace file**Parameters:**

Name	Type	Description
message	string	The message to be written to trace

**Throws:**

Throws an error if message is missing.

**<static> fatal(message)**Writes the given message with the trace-level **fatal** to the application trace file**Parameters:**

Name	Type	Description
message	string	The message to be written to trace

**Throws:**

Throws an error if message is missing.

**<static> info(message)**Writes the given message with the trace-level **info** to the application trace file**Parameters:**

Name	Type	Description
message	string	The message to be written to trace

**Throws:**

Throws an error if message is missing.

**<static> isDebugEnabled() → {Boolean}**Returns if the tracer writes an entry in the application trace file for the trace-level **debug****Returns:**

True if the tracer writes an entry for debug level

Tvinc

**Index****Classes**

<a href="#">AntiVirus</a>	\$.security
<a href="#">Application</a>	\$
<a href="#">Body</a>	\$.web
<a href="#">CallableStatement</a>	\$.db
<a href="#">Client</a>	\$.net.http
<a href="#">ColumnMetadata</a>	\$.hdb
<a href="#">Connection</a>	\$.db
<a href="#">Connection</a>	\$.hdb
<a href="#">Destination</a>	\$.net
<a href="#">Destination</a>	\$.net.http
<a href="#">EntityList</a>	\$.web
<a href="#">Job</a>	\$.jobs
<a href="#">JobLog</a>	\$.jobs
<a href="#">JobSchedules</a>	\$.jobs
<a href="#">Mail</a>	\$.net
<a href="#">ParameterMetaData</a>	\$.db
<a href="#">Part</a>	\$.net.Mail
<a href="#">PreparedStatement</a>	\$.db
<a href="#">ProcedureResult</a>	\$.hdb
<a href="#">Request</a>	\$.net.http
<a href="#">ResultSet</a>	\$.db
<a href="#">ResultSet</a>	\$.hdb
<a href="#">ResultSetIterator</a>	\$.hdb
<a href="#">ResultSetMetaData</a>	\$.db
<a href="#">ResultSetMetaData</a>	\$.hdb
<a href="#">SAXParser</a>	\$.util
<a href="#">Session</a>	\$
<a href="#">Session</a>	\$.text.analysis
<a href="#">Session</a>	\$.text.mining
<a href="#">SMTPConnection</a>	\$.net
<a href="#">SQLException</a>	\$.db
<a href="#">SQLException</a>	\$.hdb
<a href="#">Store</a>	\$.security
<a href="#">TupleList</a>	\$.web
<a href="#">WebEntityRequest</a>	\$.web
<a href="#">WebEntityResponse</a>	\$.web
<a href="#">WebRequest</a>	\$.web
<a href="#">WebResponse</a>	\$.web
<a href="#">Zip</a>	\$.util
<b>Namespaces</b>	
<a href="#">\$</a>	
<a href="#">\$.db</a>	
<a href="#">\$.hdb</a>	
<a href="#">\$.jobs</a>	
<a href="#">\$.net</a>	
<a href="#">\$.net.http</a>	
<a href="#">\$.security</a>	

**Returns:**

True if the tracer writes an entry for debug level

Type

Boolean

```
<static> isErrorEnabled() → {Boolean}
```

Returns if the tracer writes an entry in the application trace file for the trace-level **error**

**Returns:**

True if the tracer writes an entry for error level

Type

Boolean

```
<static> isFatalEnabled() → {Boolean}
```

Returns if the tracer writes an entry in the application trace file for the trace-level **fatal**

**Returns:**

True if the tracer writes an entry for fatal level

Type

Boolean

```
<static> isInfoEnabled() → {Boolean}
```

Returns if the tracer writes an entry in the application trace file for the trace-level **info**

**Returns:**

True if the tracer writes an entry for info level

Type

Boolean

```
<static> isWarningEnabled() → {Boolean}
```

Returns if the tracer writes an entry in the application trace file for the trace-level **warning**

**Returns:**

True if the tracer writes an entry for warning level

Type

Boolean

```
<static> warning(message)
```

Writes the given message with the trace-level **warning** to the application trace file

**Parameters:**

Name	Type	Description
message	string	The message to be written to trace

**Throws:**

Throws an error if message is missing.

[\\$ .net](#)

[\\$ .net http](#)

[\\$ security](#)

[\\$ security.crypto](#)

[\\$ security.X509](#)

[\\$ text](#)

[\\$ text.analysis](#)

[\\$ text.mining](#)

[\\$ trace](#)

[\\$ util](#)

[\\$ util.codec](#)

[\\$ util.compression](#)

[\\$ util.sql](#)

[\\$ web](#)

## Role builder

Friday, September 22, 2023 11:33 AM

SAP HANA Academy - Job Scheduler - Introduction [2.0 SPS 02]

XS Advanced Administration

Application Monitor Organization and Space Management Application Role Builder SAML Identity Provider Configuration User Management SAP HANA Logical Database Setup

SAP HANA Service Broker Configuration Host Management Trusted Certificates

XS Advanced Audit Logs

Create a new role collection

Create a new role collection

Role Collection

**JOBSCHEDULER\_ADMIN**

Details 0 Roles

+ Add Application Role Search

Application Name	Role Template	Role Name
No data		

Add roles :-

**JOBSCHEDULER\_ADMIN**

Add Application Role

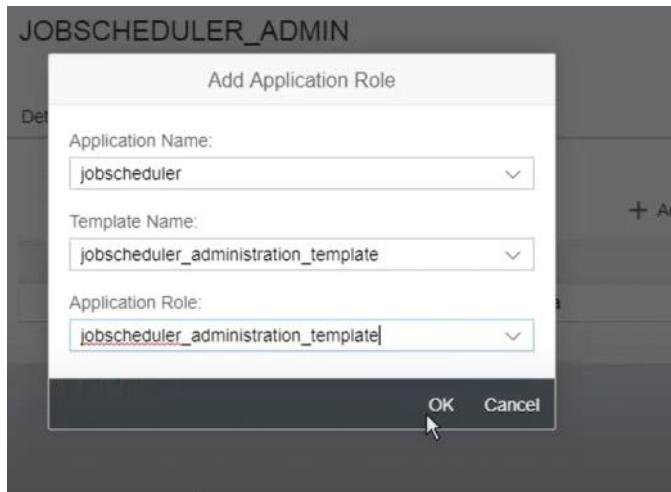
Details

Application Name:  
jobscheduler

Template Name:  
jobscheduler\_administration\_template

Application Role:  
jobscheduler\_administration\_template

**OK   Cancel**



Add both roles

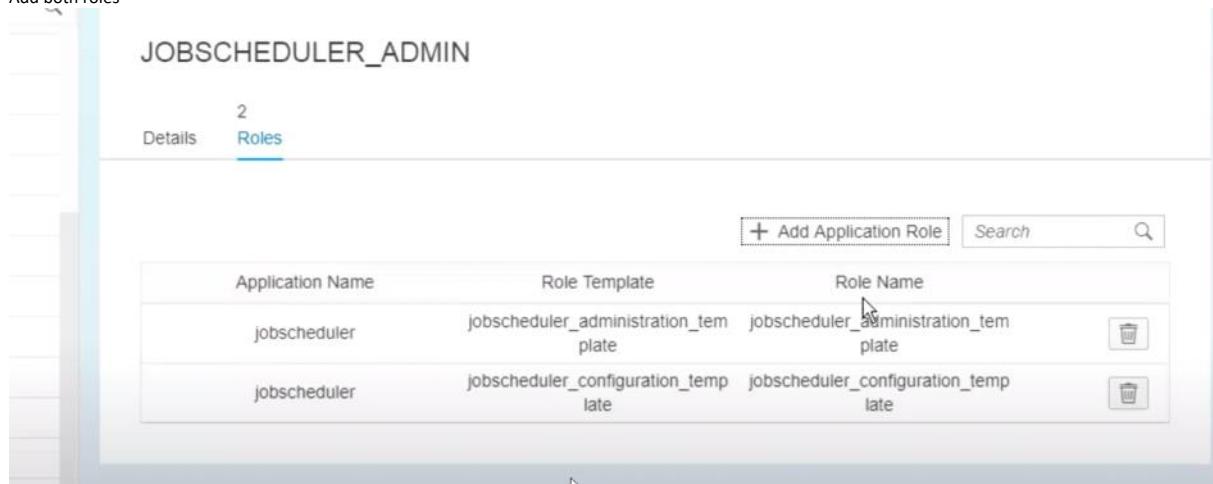
**JOBSCHEDULER\_ADMIN**

2

Details Roles

**+ Add Application Role** **Search** 

Application Name	Role Template	Role Name	
jobscheduler	jobscheduler_administration_template	jobscheduler_administration_template	
jobscheduler	jobscheduler_configuration_template	jobscheduler_configuration_template	



# 2910879 - Collecting logs from XSA applications - SAP for Me

Wednesday, September 20, 2023 4:30 PM

Clipped from: <https://me.sap.com/notes/2910879/E>

The screenshot shows a SAP for Me knowledge base article page. The left sidebar contains navigation links for Home, Calendar, Dashboards, Finance & Legal, Portfolio & Products, Services & Support, Systems & Provisioning, and Users & Contacts. The main content area displays the title "2910879 - Collecting logs from XSA applications", the release date "SAP Knowledge Base Article, Version: 5, Released On: 16.10.2020", and status information: Priority: Normal, Release Status: Released to Customer, and Quality Rating (5 stars). A search bar at the top right shows the number "63". Below the title, there are tabs for Description, Products, Available Languages, and Rate this document. The "Description" tab is selected. The content includes sections for Symptom ("You need to collect logs from an application running on XSA."), Environment ("SAP HANA Extended Application Services, Advanced model"), and Resolution. The Resolution section provides instructions for collecting logs via the XSA Cockpit or XS CLI. At the bottom, there are links for Help, Contact Us, Status, Terms of Use, Copyright and Trademarks, Cookie Statement, Cookie Preferences, and Legal.

2910879 - Collecting logs from XSA applications

SAP Knowledge Base Article, Version: 5, Released On: 16.10.2020

Priority: Normal      Release Status: Released to Customer      Quality Rating ★★★★☆

SAP Note/KBA Number 63

Description Products Available Languages Rate this document

## Symptom

You need to collect logs from an application running on XSA.

## Environment

SAP HANA Extended Application Services, Advanced model

## Resolution

In the **XSA Cockpit**, navigate to the organization > Spaces > click on the space where the app is running > Applications > click on the app name > Logs. Choose the desired options and click on the Download button to save them locally.

Alternatively, you can use the **XS CLI**. To stream the logs to a file, follow these steps:

1. Log on to XSA using the XS Command Line Interface ([instructions](#)). The XS CLI is available in the XSA host or you can [download](#) it locally.
2. Choose the organization and space where the application is running:  
`xs target -o {org} -s {space}`
3. Run: `xs logs {application} > {log_file_name}`  
Example: `xs logs myapp > myapp.log`
4. Reproduce the problem.
5. Stop the command (Ctrl + C).
6. The logs will be found in the file.

If you would like to simply dump all the logs to a file, run:

```
xs logs /application --all > /log_file_name
```

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## Commnad line arguments hana cli

Friday, September 22, 2023 1:39 PM

```
xs login -a https://api.sapuxhbd.tcc.etn.com:30033/ --skip-ssl-validation -u E9811861 -p 05#b18Nql -o Eaton -s DEV DEV
```

```
xs login -a https://api.sapuxhb1.tcc.etn.com:30533/ --skip-ssl-validation -u E9811861 -p D%zMvr6rY4F8 -o Eaton -s QA1 QA1
```

```
xs login -a https://api.sapuxhbpv.tcc.etn.com:30033/ --skip-ssl-validation -u E9811861 -p Vishnujun2023$ -o Eaton -s PROD PROD
```

[https://help.sap.com/docs/SAP\\_HANA\\_PLATFORM/1ed1948fa0664e138c088dcc61e267e0/addd59069e6f444ca6ccc064d131feec.html](https://help.sap.com/docs/SAP_HANA_PLATFORM/1ed1948fa0664e138c088dcc61e267e0/addd59069e6f444ca6ccc064d131feec.html)

## The XS Command-Line Interface Reference

From

<[https://help.sap.com/docs/SAP\\_HANA\\_PLATFORM/1ed1948fa0664e138c088dcc61e267e0/addd59069e6f444ca6ccc064d131feec.html](https://help.sap.com/docs/SAP_HANA_PLATFORM/1ed1948fa0664e138c088dcc61e267e0/addd59069e6f444ca6ccc064d131feec.html)>

Xs apps

Xs mtas

Xs logs <appname>

```
xs logs SalesOrder_DB --recent -last 10 >> "dblogs.txt"  
xs logs SalesOrder_DB --recent --type ERR -last 10 >> "dblogs.txt"
```

```
xs logs SalesOrder_DB --recent --type ERR --type OUT >> "dblogs.txt" DB module error out
```

```
xs logs SalesOrderAPIXSJS --recent --type ERR --type OUT >> "dblogs1.txt" Xsjs module error out
```

```
xs logs SalesOrderAPIWeb --recent --type ERR --type OUT >> "dblogs1.txt" Web module error out
```

### SalesOrderAPIXSJS

From <<https://xsa-cockpit.sapuxhbd.tcc.etn.com:30033/cockpit#/xsa/org/5df403f-7bb5-4193-87ef-53c8d194d72f/space/e09208e1-349a-49f3-a147-a09fcbd52e49/applications>>

```
xs set-logging-level SalesOrderXSJS /xsodata/salesOrderProjectCenter.xsodata DEBUG Enable debugging on XSJS module
```

**NAME:**

logs - Tail or show recent logs for an app

**USAGE:**

Connect to tailing logs of an application:

xs logs APP

View all staging and access logs of an application:

xs logs APP --all --source API,STG

View recent ERR and OUT application logs of a specific instance:

xs logs APP --recent --type ERR --type OUT --source APP --instance 0

**ARGUMENTS:**

APP The name of the app to show

**OPTIONS:**

--recent Dump recent logs instead of tailing

--all Dump complete logs instead of tailing

--last <NUM> Show the last NUM lines of log for this instance.

--since <TIMESPEC> Show log lines since the specified time, which is either a time span (syntax: <x>[m|h|d]) or a time stamp (expected format: yyyy-MM-dd HH:mm:ss).

--till <TIMESPEC> Show log lines till the specified time, which is a time stamp (expected format: yyyy-MM-dd HH:mm:ss). The "since" and "till" options can be combined to define a time window, if the "since" value is also given in the time stamp format.

--source <SOURCE> Filter by the given log source (e.g. API, APP, STG or RTR). Option can be specified multiple times.

--type <TYPE> Filter by the given log type (e.g. OUT, ERR, TRC, LOG, SYS or ACC). Option can be specified multiple times.

--instance <INSTANCE> Filter by the given instance indice (e.g. 0 or 1). Option can be specified multiple times.

--droplet <DROPLET> Filter by the given droplet id (e.g. 0 or 1). Option can be specified multiple times.

**SEE ALSO:**

app, apps, events, files

<https://me.sap.com/notes/0002919643>  
[Trouble Shoot XS Advanced JavaScript Applications](#)

From <<https://me.sap.com/notes/0002919643>>

You will need the [XS CLI](#) or [CF CLI](#) for this procedure, depending on the environment.

1. Set the environment variable XS\_APP\_LOG\_LEVEL to debug:  
> xs set-env <appname> XS\_APP\_LOG\_LEVEL DEBUG  
> cf set-env <appname> XS\_APP\_LOG\_LEVEL DEBUG
2. Restage the app:  
> xs restage <appname>  
> cf restage <appname>

Note: this will restart the app. Consider a short downtime.

3. Reproduce the problem
4. Collect the logs:  
> xs logs <appname> --recent > <appname>.log  
> cf logs <application-name> --recent > <appname>.log
5. Unset the environment variable:  
> xs unset-env <appname> XS\_APP\_LOG\_LEVEL  
> cf unset-env <appname> XS\_APP\_LOG\_LEVEL
6. Restage the app again

From <<https://me.sap.com/notes/0002919643>>

<https://answers.sap.com/questions/555498/sap-hana-xsa-setting-the-logging-level.html>

[https://help.sap.com/docs/SAP\\_HANA\\_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/7c242c7b0af243e5b5ebe2fb44ff4f6c.html?version=2.0.02](https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/7c242c7b0af243e5b5ebe2fb44ff4f6c.html?version=2.0.02)

## Set up Logging and Tracing for your XS Advanced JavaScript Application

From  
<[https://help.sap.com/docs/SAP\\_HANA\\_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/7c242c7b0af243e5b5ebe2fb44ff4f6c.html?version=2.0.02](https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/7c242c7b0af243e5b5ebe2fb44ff4f6c.html?version=2.0.02)>

## SAP HANA XSA: Setting the logging-level

773 Views

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Don't know what we have to use for the COMPONENT argument.

Please, could somebody help.

xs set-logging-level APP COMPONENT LEVEL  
xs sll app-js COMPONENT info

From <<https://answers.sap.com/questions/555498/sap-hana-xsa-setting-the-logging-level.html>>



**Matthias Pfefferkorn**

Jun 27, 2018 at 12:14 PM

Hi Dirk,

as described in the link (<https://help.sap.com/viewer/4505d0bdaf4948449b7f7379d24d0f0d/2.0.02/en-US/7c242c7b0af243e5b5ebe2fb44ff4f6c.html>)  
try e.g.

xs set-logging-level myapp /start.js debug  
Regards  
Matthias

From <<https://answers.sap.com/questions/555498/sap-hana-xsa-setting-the-logging-level.html>>

<https://me.sap.com/notes/0002490155>

2490155 - How to enable Execution Profiler for OData Services

SAP Knowledge Base Article, Version: 5, Released On: 11.01.2021

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**Disclaimer:** *Image/data in this KBA is from SAP internal systems, sample data, or demo systems. Any resemblance to real data is purely coincidental.*

### Environment

- SAP HANA 1.0, All Versions
- SAP HANA 2.0, All Versions

### Resolution

**Prerequisite Step**

- The first step is to enable the developer mode for xsengine. The requested profiling info is then accessible only if the XS engine is in debug mode.
- Set the xsengine configuration parameter : xsengine.ini -> httpserver -> developer\_mode = true

internal_https	true
router_https	true
xsengine.ini	
httpserver	
developer_mode	true
listenport	3\$(SAPSYSTEM)08
maxsessions	50000
maxthreads	200
sessiontimeout	900

**Executing the Profiler at the service level**

1. Add query parameter named 'profile' to OData URL that notifies the server to produce the report.
  - HTML page with the collected information in case ?profile=html (default)
  - JSON response with the collected info in case ?profile=json

For example:

https://<host\_name>/<xsodata\_service\_name>.xsodata?profile=html

https://<host\_name>/<xsodata\_service\_name>.xsodata?profile=json

2. If the parameter is present and engine is in debug mode – OData profiling is done. An example of the Profiler Execution for an OData Service for profile mode = html:

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## 2490155 - How to enable Execution Profiler for OData Services

SAP Knowledge Base Article, Version: 5, Released On: 11.01.2021

Description Products Attributes Available Languages Rate this document

```
- Request 2.713 ms
  language: en
  uri: /sap/hana/democontent/epmNext/services/businessPartners.xsodata/BusinessPartners
  profile: html
  Retrieve service document from repository 0.014 ms
- Parse request metadata 0.016 ms
  Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Parse service document 0.209 ms
Parse request 0.013 ms
Open database connection 0.373 ms
SQL statement generation 0.045 ms
Creating temporary tables 0.001 ms
- SQL statement execution 0.828 ms
  path:/BusinessPartners
- Statement 0.82 ms
  sql:select "BusinessPartnersType1"."PARTNERID"
    "0","BusinessPartnersType1"."PARTNERID","BusinessPartnersType1"."PARTNERROLE",
    from "SAP_HANA_EPM_NEXT"."sap.hana.democontent.epmNext.data::EPN.MasterData.Bu
  Preparation 0.326 ms
  Execution 0.474 ms
  Serializing XML response 1.035 ms
```

### See Also

<https://blogs.sap.com/2014/12/02/sap-hana-sps-09-new-developer-features-new-xsodata-features/>

### Odata Execution Tracking Utility

In order to ease the supportability and analysis of performance for OData request in HANA, we've added functionality to request to profile the performance of request processing (executed queries and the time spent in different OData components) in read and write requests. The requested profiling info is then accessible only if the XS engine is in debug mode.

Main usage is – tracking performance by:

1. Add query parameter named 'profile' to OData request that notifies the server to produce the report
2. If the parameter is present and engine is in debug mode – OData profiling is done
3. OData response is skipped and the server returns:

HTML page with the collected information in case profile=html (default)

JSON response with the collected info in case profile=json

```
- Request 2.713 ms
  language: en
  uri: /sap/hana/democontent/epmNext/services/businessPartners.xsodata/BusinessPartners
  profile: html
  Retrieve service document from repository 0.014 ms
- Parse request metadata 0.016 ms
  Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Parse service document 0.209 ms
Parse request 0.013 ms
Open database connection 0.373 ms
SQL statement generation 0.045 ms
Creating temporary tables 0.001 ms
- SQL statement execution 0.828 ms
  path:/BusinessPartners
- Statement 0.82 ms
  sql:select "BusinessPartnersType1"."PARTNERID"
    "0","BusinessPartnersType1"."PARTNERID","BusinessPartnersType1"."PARTNERROLE",
    from "SAP_HANA_EPM_NEXT"."sap.hana.democontent.epmNext.data::EPN.MasterData.Bu
  Preparation 0.326 ms
  Execution 0.474 ms
  Serializing XML response 1.035 ms
```

[https://help.sap.com/docs/SAP\\_HANA\\_ONE/1c837b3899834ddcbae140cc3e7c7bdd/86c9d3762a6b47039346f8ef075f8a7a.html](https://help.sap.com/docs/SAP_HANA_ONE/1c837b3899834ddcbae140cc3e7c7bdd/86c9d3762a6b47039346f8ef075f8a7a.html)

## httpserver

Use the `httpserver` section of the `xsengine.ini` file to set configuration options for the SAP HANA XS Web server, for example, port numbers, and maximum number of sessions and threads allowed.

Table 66:

Parameter	Description	Example Value	Default Value
developer_mode	Enable verbose output for HTTP codes/messages	True/False	False
embedded	Enable the SAP HANA XS engine to run in embedded mode (in the index server).	True/False	False
login_screen_background_image	URL to the image displayed as background in the logon screen, with the following prerequisites: <ul style="list-style-type: none"><li>▪ File must be reachable by http(s)</li><li>▪ No requirement for authentication or authorization</li><li>▪ Recommended minimum resolution of image: 1600*1200</li></ul>	/sap/hana/xs/ui/Image.jpg	None

## BWD

The screenshot shows the SAP HANA Cockpit interface. The title bar indicates the session is connected to BW1@HB1 and BWD@HBD. The main area displays the configuration for the `xsengine.ini` file under the `System` category. The `httpserver` section is expanded, showing the `developer_mode` parameter set to `false`. Other parameters like `embedded`, `listenport`, and `max_sessions` are also listed. The configuration tab is selected in the top navigation bar.

Name	Default	System	Database	Host - sapuxhbd...
executor.ini				
global.ini	+	+	+	
indexserver.ini	+	+		
scriptserver.ini				
statisticsserver.ini				
streamingserver.ini				
xscontroller.ini	+			
<b>xsengine.ini</b>	+	+		
application_container				
communication				
debugger				
geocoding				
httpclient				
<b>httpserver</b>				
<b>developer_mode</b>	<b>false</b>	+	+	
<b>embedded</b>	<b>true</b>	● <b>true</b>	● <b>true</b>	
listenport	3\$(SAPSYSTEM)08			
max_recursive_count	3			
max_request_runtime	300			
maxsessions	50000			
maxthreads	10			
root_page				
sessiontimeout	900			
workerpoolsize	5			
jvm				
persistence				
public_urls	+	+		
pythontrace				
row_engine				
scheduler	+	+		
smtp	+	+		
sql				
sqltrace				

<https://blogs.sap.com/2019/05/16/hana-cockpit-get-your-xs-engine-straight/>

BW1:-

BW1@HB1 :: BWD@HBD

**BW1@HB1 (XX\_SUP\_PC\_API) BW1 sapuxhb1.tcc.etn.com 05**

Overview | Landscape | Alerts | Performance | Volumes | Configuration | System Information | Diagnosis Files | Trace Configuration | Filter: |

Name	Default	System	Database	Host - sapuxhb1...
> dserver.ini			*	
> eserver.ini				
> executor.ini				
> global.ini		*	*	*
> indexserver.ini		*	*	
> scriptserver.ini				
> statisticsserver.ini				
> streamingserver.ini				
> xscontroller.ini		*		
> xsengine.ini		*	*	
> application_container				
> communication				
> debugger				
> geocoding				
> httpclient				
> httpsserver				
developer_mode	false		*	
embedded	true	● true	● true	
listenport	3\$(SAPSYSTEM)08			
max_recurive_count	3			
max_request_runtime	300			
maxsessions	50000			
maxthreads	10			
root_page				
sessiontimeout	900			
workerpoolsize	5			
> jvm				
> persistence				
> public_urls		*	*	
> pythontrace				
> row_engine				
> scheduler				
> smtp		*	*	
> sql				

# Installing XS CLI Client | SAP Tutorials

Wednesday, September 20, 2023 4:30 PM

Clipped from: <https://developers.sap.com/tutorials/hxe-ua-install-xs-xli-client.html>

The screenshot shows a SAP Learning page. At the top, there's a navigation bar with the SAP logo, 'Learning', 'Learn', 'Get Certified', 'My Learning', 'Explore SAP', and other icons. Below the navigation is a breadcrumb trail: 'Install the SAP HANA, express edition Clients' > 'Installing XS CLI Client'. On the right side of the main content area are 'Feedback' and 'Share' buttons, and a 'Next' button.

## Installing XS CLI Client

Beginner 10 min. SAP HANA, express edition, Tutorial, Beginner

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

You will learn

How to install the XS advanced client-tools bundle.



Adrian Plata June 25, 2020

Created by April 13, 2018

Contributors

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

[Open all](#) [Close all](#)

### STEP 1

#### XS CLI client info.

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

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

[Log in to complete tutorial](#)

[Done](#)

**STEP 2**

## Download the client package.

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

1. Save the Download Manager installation files to your client machine and open it. For instructions on downloading and running the Download Manager, see either the [Installing SAP HANA 2.0, express edition \(Binary Installer Method\)](#) or [Installing SAP HANA 2.0, express edition \(Virtual Machine Method\)](#) tutorials, or go straight to the SAP HANA, express edition [registration page](#).
2. In Download Manager, in the **Image** pull-down, select either **Virtual Machine** or **Binary Installer**.
3. Click **Browse** and select a directory where your client package will be saved.
4. Select the **Clients** package that matches the machine you will be installing the clients on. Clear the Select boxes of all other packages.
5. Click **Download**. The **hdb\_client\_<OS>.tgz** file, or **clients\_windows.zip** for Windows, downloads to your save directory.
6. Extract the compressed clients file:
  - For Windows and Mac machines, use a compression utility.
  - For Linux machines, navigate to the directory in which you wish to extract the client files and use the **tar** command:

```
cd <preferred_filepath>
1 | sudo tar -xzf <download_filepath>/clients_<OS>.tgz
```

[Copy](#)

These files are extracted:

```
clients_linux_x86_64.tgz
o hdb_client_linux_x86_64.tgz
o xs.onpremise.runtime.client_linuxx86_64.zip

clients_linux_ppc64.le.tgz
o hdb_client_linux_ppc64le.tgz
o xs.onpremise.runtime.client_linuxx86_64.zip

clients_windows.zip
o hdb_client_windows_x86_32.tgz
o hdb_client_windows_x86_64.tgz
```

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

`clients_mac.tgz`

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

[Log in to complete tutorial](#)

[Done](#)

### STEP 3

#### Install the XS CLI client.

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

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

The system creates this folder:

bash

[Copy](#)

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

[Log in to complete tutorial](#)

[Done](#)

### STEP 4



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

### STEP 5



#### Verify XS Advanced runtime is installed.

 STEP 5



Verify XS Advanced runtime is installed.

 STEP 6



Confirm XS Advanced is Available

 STEP 7



Connect to XS Advanced controller.

 STEP 8



Add SSL certificate to connect to the server.

 STEP 9



Test the XS Advanced connection.

## Next Steps

 TUTORIAL



Installing SAP HANA HDB Client (Linux)

 10 min.

1

Step 1: XS CLI client info.

2

Step 2: Download the client package.

3

Step 3: Install the XS CLI client.

4

Step 4: Add the bin folder to the PATH environment variable.

Step 5: Verify XS Advanced runtime is installed

- 4 Step 4: Add the bin folder to the PATH environment variable.
- 5 Step 5: Verify XS Advanced runtime is installed.
- 6 Step 6: Confirm XS Advanced is Available
- 7 Step 7: Connect to XS Advanced controller.
- 8 Step 8: Add SSL certificate to connect to the server.
- 9 Step 9: Test the XS Advanced connection.

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The screenshot shows the SAP HANA Developer Guide for SAP HANA XS Advanced Model (SAP Web IDE) page. At the top, there's a navigation bar with links to Home, SAP HANA Platform, SAP HANA Developer Guide for SAP HANA XS Advanced Model (SAP Web IDE), and The XS Command-Line Interface. Below the navigation bar is the main title "SAP HANA Developer Guide for SAP HANA XS Advanced Model (SAP Web IDE)" with a subtitle "2.0 SPS 07▼". Underneath the title are two search fields: "This document ▾" and "Search in this document". To the right of the search fields is a "Advanced Search" link. The main content area features a large heading "The XS Command-Line Interface". Below this heading is a "On this page" section with links to "Usage", "Environment Variables", "Global XS Command-Line Options", and "Related Information".

## The XS Command-Line Interface

### On this page

- [Usage](#)
- [Environment Variables](#)
- [Global XS Command-Line Options](#)
- [Related Information](#)

A list of all the categories and areas covered by the xs command-line interface (CLI).

The XS CLI enables you to maintain not only the applications that are deployed to the XS advanced run-time environment, but also the run-time environment itself, and the users who access and use it. The XS advanced command-line client is included not only in the full XS advanced run-time instance installed on the server but in a separate "client" package for installation on a remote machine.

SAP HANA Developer Guide for XS Advanced Model (SAP Web IDE)

- [Introduction to Application Development and Deployment \(XS Advanced Model\)](#)
- [Getting Started with SAP HANA Development](#)
- [Maintaining the XS Advanced Application Development & Deployment Descriptors](#)
- [Defining the Data Model in XS Advanced](#)
- [Defining Web-based Data Access in XS Advanced](#)
- [Writing the XS Advanced Application Code](#)

### Tip

The XS advanced command-line client is available for download on SAP Service Marketplace at the following location for those people with the required S-User ID:

[Service Marketplace](#) ▾ [Software Downloads \[Downloads\]](#) ▾ [SUPPORT PACKAGES & PATCHES](#) ▾ [BY](#)

- Defining Web-based Data Access in XS Advanced
- Writing the XS Advanced Application Code
- Maintaining Application Services in XS Advanced
- Creating the Client User Interface
- Maintaining XS Advanced Application Routes and Destinations
- Maintaining Application Security in XS Advanced
- Migrating XS Classic Applications to XS Advanced Model
- HDI Artifact and Build Plug-in Configuration

#### **The XS Command-Line Interface**

- The XS Command Overview
- SAP Web IDE for SAP HANA Reference
- Important Disclaimer for Features in SAP HANA

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- **SAP HANA PLATFORM EDIT.**  
 1.0 □ XS ADVANCED RUNTIME □ XS  
 RUNTIME 1
- **SAP HANA PLATFORM EDITION**  
 2.0 □ XS RUNTIME 1

## Usage

```
xs <command> [<ARGUMENTS>] [<OPTIONS>]
```

To display information about a specific xs command, run the following command:

```
xs help <command>
```

To display information about **all** available xs commands, run the following command:

```
xs help -a
```

## Environment Variables

### Sample Code

```
XS_TRACE=true
```

XS CLI Environment Variables

Variable	Value
XS_TRACE	true
	path/to/trace.

XSCLIENT_CONTEXTFILE	path/to/config
----------------------	----------------

## Global XS Command-Line Options

XS CLI Environment Variables

Variable	Value	Description
--verbose	-	Print verbose information to stdio
--context-file	path/to/config.cfg	Override path to default configuration file

## Related Information

[SAP Software Download Center \(Logon required\)](#)

[SAP HANA Administration Guide](#)

# XS Advanced, Use SQLScript in Calculation Views | SAP

## Tutorials

Thursday, November 16, 2023 8:42 AM

Clipped from: <https://developers.sap.com/tutorials/xsa-calculation-view-table-function-sqlscript.html>

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# XS Advanced, Use SQLScript in Calculation Views

Advanced

25 min.



[SAP HANA](#), [SAP HANA, express edition](#), [Tutorial](#), [Big Data](#), [Advanced](#)

Create a Table Function and wrap it in a Graphical Calculation View

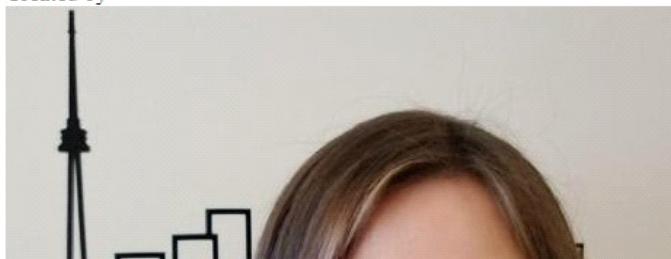
You will learn

- How to implement more complex logics using SQLScript in Table Functions
- How to incorporate Table Functions in Graphical Calculation views
- Create a replacement to the former Scripted Views in previous versions of SAP HANA
- Apply the DENSE\_RANK function, to establish the ranking of a row relative to a partition of a dataset



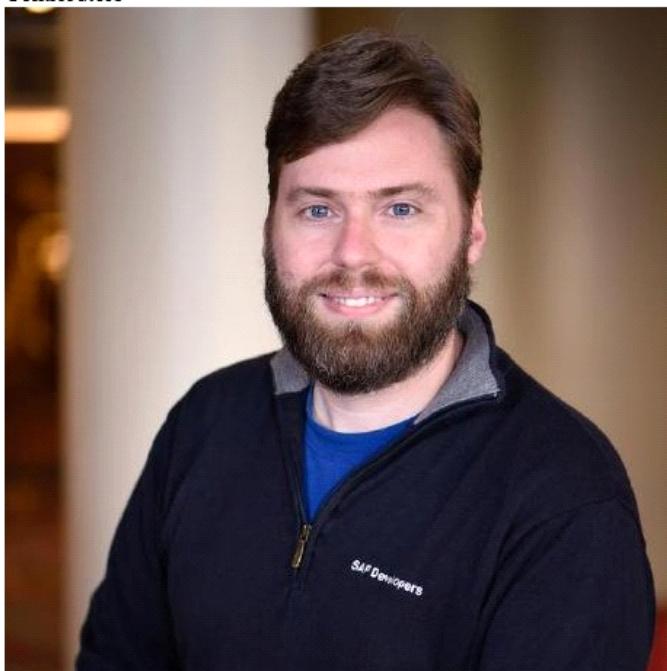
[Thomas Jung](#) January 5, 2021

Created by





September 14, 2018  
Contributors





## Prerequisites

- This tutorial is designed for SAP HANA on premise and SAP HANA, express edition. It is not designed for SAP HANA Cloud.
- [Getting started with SAP HANA, XS Advanced Development](#)
- [Import sample data from the SHINE model](#)

This tutorial assumes general knowledge of the modeling tool has been acquired through completion of the [beginner and intermediate tutorials about calculation views](#).

[Open all](#) [Close all](#)

- Step 1



Create a function

In your db/src folder, create a new folder called functions.



Create folder

Create a function called SO\_RANKING



Function

A template is created for you with different sections



Function

Remove the placeholder for the namespace. Paste the following code into the input section:

```
sql
Copy
IP_FR_DATE DATE,
IP_TO_DATE DATE,
IP_REGION NVARCHAR(4)
```

Add the following as a returning table:

```
SQL
Copy
table ( COMPANY_NAME NVARCHAR(80),
         REGION NVARCHAR(4),
         SALES DECIMAL(18,2),
         ORDERS INTEGER,
         SALES_RANK INTEGER,
         ORDER_RANK INTEGER )
```

Add the following code between BEGIN and END:

```
sql
Copy
return
SELECT company_name, region, sales, orders, sales_rank, order_rank from(
select
    T2."COMPANYNAME" as COMPANY_NAME,
    T3."REGION" as REGION,
    sum(T1."NETAMOUNT") as SALES,
    count(T0."SALESORDERID") as ORDERS,
    dense_rank() over ( order by sum(T1."NETAMOUNT") desc ) as sales_rank,
    dense_rank() over ( order by count(T0."SALESORDERID") desc ) as order_rank
    )
```

```

        sum(T1."NETAMOUNT") as SALES,
        count(T0."SALESORDERID") as ORDERS,
        dense_rank() over ( order by sum(T1."NETAMOUNT") desc ) as sales_rank,
        dense_rank() over ( order by count(T0."SALESORDERID") desc ) as order_rank
        from "SO.Header" T0
    inner join "SO.Item" T1 on T0."SALESORDERID" = T1."HEADER.SALESORDERID"
    inner join "MD.BusinessPartner" T2 on T0."PARTNER.PARTNERID" = T2."PARTNERID"
    inner join "MD.Addresses" T3 on T2."ADDRESSES.ADDRESSID" = T3."ADDRESSID"
    where TO_DATE(T1."DELIVERYDATE") between :IP_FR_DATE and :IP_TO_DATE
        and T3."REGION" = :IP_REGION
    group by T2."COMPANYNAME", T3."REGION"
    order by sales_rank, T2."COMPANYNAME"
)
where sales_rank < 11;

```

Save and build the function. This is what it should look like



For more information about DENSE\_RANK() and other function modules, visit the [SAP HANA and System Views Reference](#)

[Log in](#) to complete tutorial [Done](#)

- Step 2



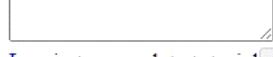
[Test the function](#)

You can test the function using the SQL console. Go into the database explorer and locate the function within your HDI container. Right-click on it and choose **Generate Select Statement**.



[Function](#)

Use dates from 2014-12-01 to 2014-12-05 and region EMEA as parameters to complete the validation below. How many orders were sold by the company ranking number 1 in sales?



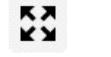
[Log in](#) to complete tutorial [Check answer](#)

- Step 3



[Create a Calculation View](#)

In the `src/models` folder, create a Calculation View of type dimension



[Calculation View](#)

Add your table function to the projection node



[Calculation View](#)

In the projection node, add all the columns to the output



[Calculation View](#)

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- Step 4



[Map parameters](#)

Go to the parameters tab and click on **manage parameter mapping**

#### Map parameters

Go to the parameters tab and click on **manage parameter mapping**



Calculation View

Choose the **Auto Map** button to automatically map the parameters to the columns in your calculation view



Calculation View

**Save and Build** your view.

#What are the different types of views for?

- Empty type: The view of type default or empty, is not exposed to BI tools and is free-form.
- Cube: measures, aggregations. Exposed to BI Tools (generates BI Metadata)
- Cube with star Join: Join fact data with dimension type calculation view. For example, join transactional data containing prices and discounts (facts) with data that helps to organize those facts, such as master data (customers, product categories) or time dimensions (quarters, years).
- Dimension: No measures, no aggregations and no exposure to BI tools.

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- Step 5



[Test the Calculation View](#)

Right-click on the calculation view and choose **data preview**. Fill the parameters as follows and click **Run**



Calculation View

The results are displayed and the rank functionality becomes obvious. Copy and paste the SQL statement in the validation below to complete it:



[Log in](#) to complete tutorial [Check answer](#)

- [Create a function](#)
- [Test the function](#)
- [Create a Calculation View](#)
- [Map parameters](#)
- [Test the Calculation View](#)

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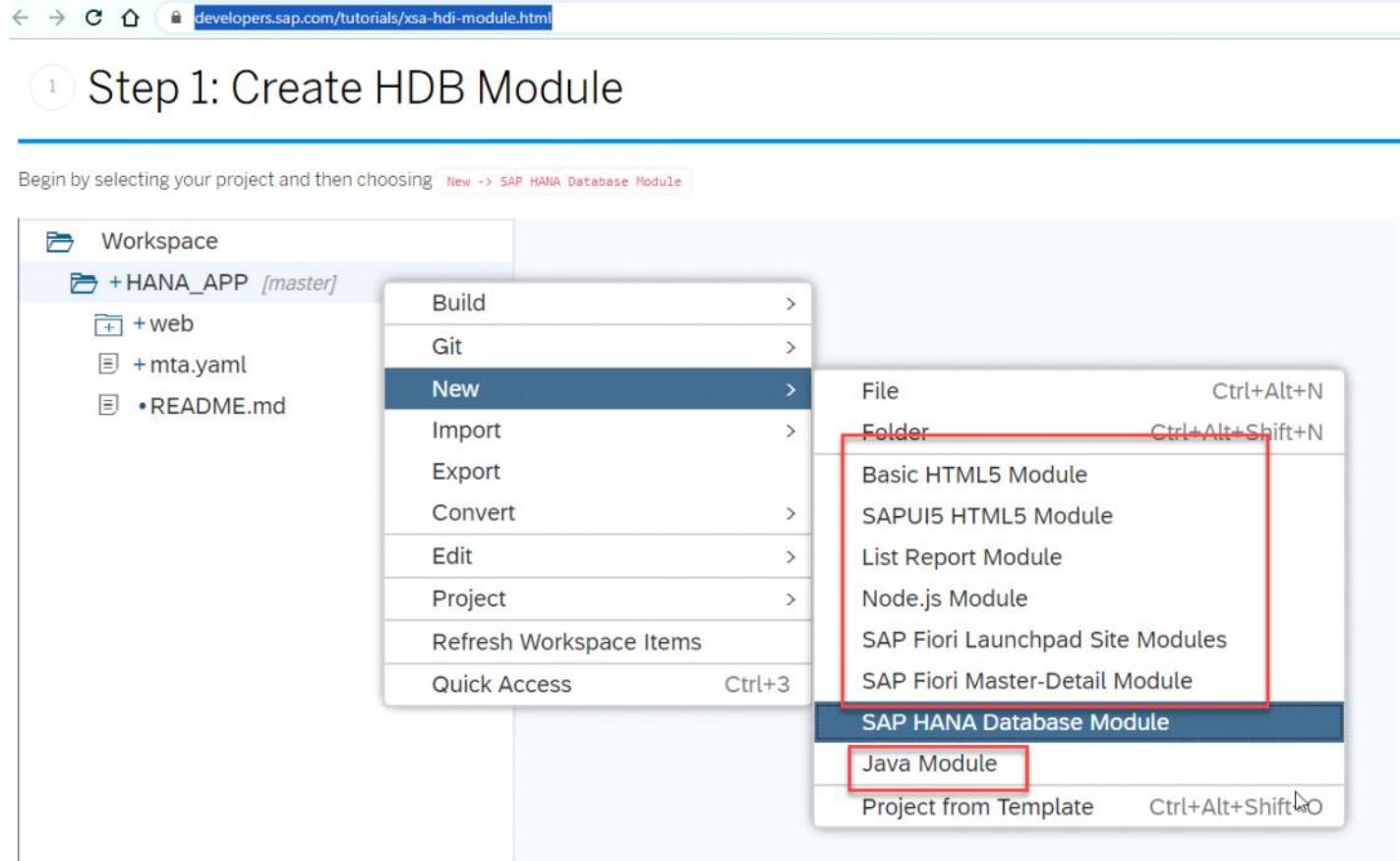
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<https://developers.sap.com/tutorials/xsa-hdi-module.html>



# Migrate HANA XS Classic to XS Advance | HANA XS classic and XS Advance comparison and migration

Wednesday, April 14, 2021 9:35 AM

[Migrate HANA XS Classic to XS Advance | HANA XS classic and XS Advance comparison and migration](#)



# Migrate Your XS Classic Application to XS Advanced - SAP Help Portal

Wednesday, April 14, 2021 9:36 AM

Clipped from:

<https://help.sap.com/viewer/58d81eb4c9bc4899ba972c9fe7a1a115/2.0.02/en-US/5775fac4200441589c12a5421d0bcb1e.html>

Run the XS Advanced Migration Assistant to convert your XS classic application to XS advanced.

## Prerequisites

Before migrating your XS classic application to XS advanced using the XS Advanced Migration Assistant, bear in mind the following points:

- You must already have converted manually any XS classic artifacts that cannot be migrated automatically by the XS Advanced Migration Assistant.
- You must already have set up the source (XS classic) system for the migration
- You have set up the required users on the SAP HANA systems and assigned them the required access permissions.
- The XS Advanced Migration Assistant uses the SAP Java Virtual Machine (JVM), so make sure the correct C++ library is installed on Windows machines, for example, the x64 variant of the Microsoft C++ runtime.

**Restriction** The target XS advanced system where you plan to deploy the migrated application must be running HANA 2.0. You cannot use the XS Advanced Migration Assistant to help you migrate your XS classic application to an SAP HANA 1.0 system, for example, SPS 11 or SPS 12.

## Procedure

1. Install the migration software.
  - a. Download the latest XS Advanced Migration Assistant package.
  - b. Unpack the ZIP archive to any directory.  
Do not use any spaces in the name of the download directory. To avoid problems with long file names in Windows, place it close to the root directory (for example, C:\).
2. Configure the connection between the XS classic and XS advanced systems.  
You can define the connection settings in two ways. Either using set (Windows) or export (Linux) on the command line or using a .env file that contains all key-value pairs.  
The XS Advanced Migration Assistant supports the following parameters:  
[HANA | HANAEXT]\_HOST=<HANA hostname>  
[HANA | HANAEXT]\_SQL\_PORT=<HANA SQL port>

```
[HANA | HANAEXT]_USER=<HANA username>
[HANA | HANAEXT]_PASSWD=<HANA password>
[HANA | HANAEXT]_CERTIFICATE=</path/to/HTTPS/certificate.file>
Note If you define the settings in the .env file, you do not need to set the environment variables on the command line. If you have already set the environmental variables, duplicate entries for the same variables in the .env file are ignored.
```

- a. In the classic system, define environment settings for the application project delivery units (DU).

For Windows systems:

```
set HANA_HOST=<HANA hostname>
set HANA_SQL_PORT=<HANA SQL port>
set HANA_USER=<HANA user>
set HANA_PASSWD=<HANA password>
set HANA_CERTIFICATE=</path/to/HTTPS/certificate/file>
```

- b. (Optional) Configure environment settings for external parsing.

If your source database doesn't support the procedure

SYS.GET\_OBJECTS\_IN\_DDL\_STATEMENT, you can use an external parse system with the following environment variables:

For Windows systems use set and for Linux sytems use export:

```
set HANAEXT_HOST=<XSA hostname>
set HANAEXT_SQL_PORT=<HANA SQL port>
set HANAEXT_USER=<HANA username>
set HANAEXT_PASSWD=<HANA password>
set HANAEXT_CERTIFICATE=</path/to/HTTPS/certificate/file>
```

Perform the following steps for a staged migration. Otherwise go to the "Run the XS Advanced Migration Assistant" step.

1. Choose your migration strategy.

Option Description

**Migrate with provider configuration on**

Your configuration defines, the service whch backs each external object. If you know the dependencies of the migrated units, this option is the preferred way.

**Migrate with auto-generated providers**

The migration assistant groups external objects based on the schema they belong to. For each schema, it creates a separate backing service and **synonym** configuration. This strategy can be combined with the first one to automatically group all objects that are not covered by the supplied configuration.

**Migrate with a single default provider**

The migration assistant generates a configuration that defines only a single backing service, which provides all found external objects. This approach is also valid if you use fixed schema names in the target section of your synonym configuration.

2. (Optional) Create configuration.

If you use the migration with provider configuration, use the option [--synonym-target-provider <path-to-configuration-file>] to pass the configuration file to the migration assistant.

3. Run the XS Advanced Migration Assistant.
  - a. In the command shell (or at the "system" level), set the path to the root folder of the XS Advanced Migration Assistant (xs-migration). The root folder contains the package.json and the xs-migration executable (xs-migration.bat for Windows or xs-migration for Linux).
  - b. Run the xs-migration or xs-migration.bat command with the desired options.  
If you run the commands without any options, the migration does not start; instead, it displays details of the options supported by the migration tool.

The following simple example shows how to use the XS Advanced Migration Assistant:

```
xs-migration --target-dir /root/tmp/test_migration/result  
DU1, sap.com
```

The command shown in the example takes the content from DU1 from vendor "sap.com", generates a template of an XS advanced folder structure, and places the migrated objects in the folder /root/tmp/test\_migration/result. It also generates a report with a list of the problems detected; read the report and solve any problems before re-running the migration assistant or using the application in the advanced environment.

# HANA XSA Simplified 2: HANA XS classic and XS Advance comparison and migration from XSC to XSA | SAP Blogs

Wednesday, April 14, 2021 9:59 AM

Clipped from: <https://blogs.sap.com/2020/06/30/hana-xsa-simplified-2-hana-xs-classic-and-xs-advance-comparison-and-migration-from-xsc-to-xsa/>

As I promised in my earlier blog post, I have come up with next blog post in this series on XS classic and XS advance comparison and how to migrate your existing XSC application to XSA. In this blog post you will understand step by step process to migrate from XSC to XSA process.

You can visit other blog posts in this series using below links.

[HANA XSA Simplified 1: HANA XSA Implementation Methodology for different customer scenarios.](#)

[HANA XSA Simplified 3: Using GIT as a central repository in WebIDE and Deploy Process](#)

[HANA XSA Simplified 4: SAP HANA Database Authorization provisioning for HDI Container roles](#)

[HANA XSA Simplified 5: Deployment options for XS Advance MTA projects](#)

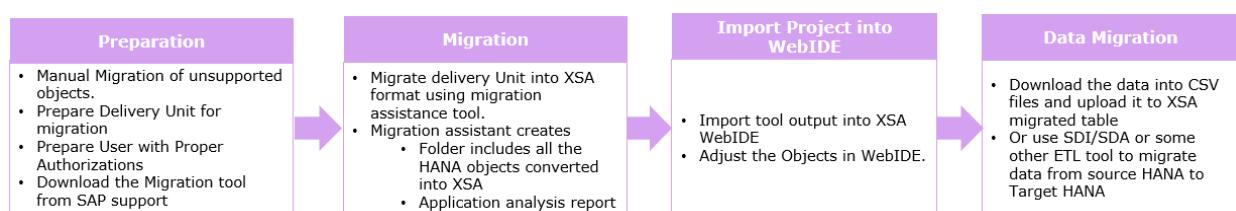
In below table, I have summarized high level comparison between XSC and XSA. To see the more details about the changes from XSC to XSA technical architecture and other aspects, you can visit the below link.

<https://help.sap.com/viewer/58d81eb4c9bc4899ba972c9fe7a1a115/2.0.04/en-US/b1333dbbfa9549ffa76850b5b5ca455a.html>

Criteria	XS Classic	XS Advanced
General	SAP HANA XS classic is a lightweight application server includes web based HTTP and OData services. It can consume HANA database artifacts (e.g. calculation views) and it has built in support for the SAP Fiori UI. It supports transactional services based on core data services (CDS). It uses database permissions; there are	SAP HANA XS Advanced is an enhanced application server for native development in the SAP HANA environment. It evolved from SAP HANA XSC. SAP has added support of runtimes like Java, Nodejs and build packs like python developments. It also added more different components like xsa cockpit, webide, hrrt-

		DB users in HANA itself. core etc. for developing It was introduced in SAP HANA 1.0 SPS 05.	core etc. for developing applications. It was introduced in SAP HANA 1.0 SPS 11.
Programming Model	XSJS and oData		XSJS, oData, Node.js, C++
Database	Schema-based		HDI Container based database module
Security	Uses Repository roles, Users, SAP provided HANA roles at HANA database level		Uses XSA security for developers, HANA database security for third party reporting end users using Repository roles, xs-security.json for web based developments
Development environment	HANA Studio and Web Development Workbench		WebIDE
Artifacts repository	HANA Repository	Git	
Transport	CTS+, ABAP Based Transports, Delivery Units	XS Deploy, CTS+, Jenkins and CI/CD, ABAP Based Transports	
Deployment	Projects are directly deployed on the Database	Projects are deployed onto Organization and Spaces	
Isolation	Content isolation is possible only using schema and packages	Content isolation is possible with HDI Container	
Role Provisioning	Any user with Role Admin authorization can provision roles to others	Object owner user is owner of all the authorization; only object owner can provide the roles created inside that container to other users	

High level steps in migration from HANA XSC to XSA.



## Preparation

In this step, we will prepare the source system, delivery unit and user for migration.

1. Migration from the XSC to XSA: In below table you can find the XSC Objects which are not supported by the XSA Migration tool. These XSC objects first need to be migrated to supported objects in XSC itself. There is a tool within HANA studio which helps to convert some of these objects like Analytical Views, Attribute Views to Calculation views but most of the objects need to be converted manually like Catalog tables to HDB Tables. If Catalog tables are not converted into HDB tables or Repository tables then these tables will not get migrated. You will have to manually migrate these tables into classic schema of your Target HANA system and then create the User provided service to access these tables. Migration tool will create the synonyms to access these tables in HANA XSA project.

XSC Non-Supported Objects	XSC Supported Objects
Analytical Views, Attribute Views, Scripted (text-based) calculation views	Graphical Calculation View
Catalog Schema, Catalog tables	HDB tables or Repository tables
XML-based analytic privileges	SQL analytic privileges
Application Function Library (AFL) models	AFLLang procedure
Decision tables	Graphical Calculation View

2. Download the migration software: Download the latest XS Advanced Migration Assistant package 'XSAC Migration 1' from SAP Software Download portal or use the SAP Note [2362604](#) – SAP HANA XS Migration Assistant 1 for SAP HANA 2.0 SPS0.

The screenshot shows a download interface for SAP HANA XS Migration Assistant 1. At the top, there's a header with 'Items (2)' and various filter and search options. Below is a table with two rows:

Selected Items (0)		
Name	Type	Related Info
XS_MIGRATION_00_25-70002310.ZIP	Support Package XSAC MIGRATION 1 Linux on x86_64 64bit	≡
XSAC MIGRATION 1		
XS_MIGRATION_00_25-70002351.ZIP	Support Package XSAC MIGRATION 1 Windows on x64 64bit	≡
XSAC MIGRATION 1		

At the bottom left, a note says '(\*) for validation only'.

Unpack the ZIP archive on your local desktop or laptop. Place this directory close to the root directory (for example, C:\). Only for Linux: Make the \xs-migration and \sapjvm\_8\_jre\bin\java files executable.

3. Prepare the delivery unit in source system: Collect all the packages in delivery unit which you would like to migrate. Let us consider delivery unit name is DU\_XSA\_MIGRATION.
4. Source system check: If your Delivery Unit is on the source system, whose version is SAP HANA 1.0 SPS 10 or less than this then it will not have the procedure SYS.GET\_OBJECTS\_IN\_DDL\_STATEMENT available.

In this case you will have to use the Target system as Parsing system. If your Delivery Unit is on the source system, whose version is SAP HANA SPS 11 or more then you do not need the parsing system.

5. Enable GET\_OBJECTS\_IN\_DDL\_STATEMENT: If source HANA system is single tenant, then execute following SQL statements on your SYSTEM database
- ```
ALTER SYSTEM ALTER CONFIGURATION ('indexserver.ini', 'system') SET ('sqlscript', 'enable_builtin_procedure_get_objects_in_ddl_statement') = 'true' WITH RECONFIGURE
```

If source HANA system is Multi-tenant, then execute following SQL statements on your SYSTEM database

```
ALTER SYSTEM ALTER CONFIGURATION ('nameserver.ini', 'system') SET ('sqlscript', 'enable_builtin_procedure_get_objects_in_ddl_statement') = 'true' WITH RECONFIGURE
```

6. User authorization: Below authorizations are required for the user in source system which will be used for migration. Let us consider migration user in source system is XSA\_MGR. Try to use SYSTEM user to provide these authorizations; as SYSTEM user will have permission to provide these authorizations.

```
Object      GRANT EXECUTE ON "SYS".""
privileges  GET_OBJECTS_IN_DDL_STATEMENT" TO "XSA_MGR";
            GRANT EXECUTE ON "SYS"."GET_OBJECT_DEFINITION" TO
            "XSA_MGR";
            GRANT EXECUTE ON "SYS"."REPOSITORY_REST" TO
            "XSA_MGR";
            GRANT SELECT ON "_SYS_BI"."M_SCHEMA_MAPPING" TO
            "XSA_MGR";
            GRANT SELECT ON "SYS"."GRANTED_PRIVILEGES" TO
            "XSA_MGR";
            GRANT SELECT ON "SYS"."GRANTED_ROLES" TO "XSA_MGR";
            GRANT SELECT ON "SYS"."M_DATABASE" TO "XSA_MGR";
            GRANT SELECT ON "SYS"."OBJECTS" TO "XSA_MGR";
            GRANT SELECT ON "SYS"."OBJECT_DEPENDENCIES" TO
            "XSA_MGR";
            GRANT SELECT ON "SYS"."PROCEDURES" TO "XSA_MGR";
            GRANT SELECT ON "SYS"."SYNONYMS" TO "XSA_MGR";
            GRANT SELECT ON "SYS"."TABLE_COLUMNS" TO "XSA_MGR";
            GRANT SELECT ON "SYS"."TABLES" TO "XSA_MGR";
            GRANT SELECT ON "_SYS_REPO"."
ACTIVE_CONTENT_TEXT_CONTENT" TO "XSA_MGR";
            GRANT SELECT ON "_SYS_REPO"."ACTIVE_CONTENT_TEXT"
TO "XSA_MGR";
            GRANT SELECT ON "_SYS_REPO"."
ACTIVE_OBJECT_TEXT_CONTENT" TO "XSA_MGR";
            GRANT SELECT ON "_SYS_REPO"."
ACTIVE_OBJECT_TEXT_CONTENT" TO "XSA_MGR";
            GRANT SELECT ON "_SYS_REPO"."ACTIVE_TAGS" TO
```

```

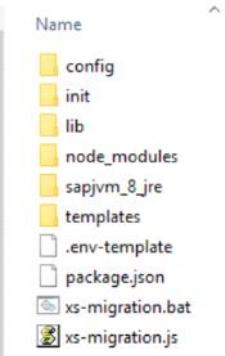
    "XSA_MGR";
    GRANT SELECT ON "_SYS_REPO"."
CATALOG_OBJECTS_CREATED_BY_REPOSITORY_ACTIVATION
S" TO "XSA_MGR";
    GRANT SELECT ON "_SYS_RT"."CDS_ANNOTATION_VALUE" TO
"XSA_MGR";
    GRANT SELECT ON "_SYS_RT"."CDS_ARTIFACT" TO
"XSA_MGR";
    GRANT EXECUTE ON "SYS"."
GET_OBJECTS_IN_DDL_STATEMENT" TO "XSA_MGR";
System   GRANT "CATALOG READ" to "XSA_MGR";
privileges
Package  GRANT REPO.READ on "<your-package>" to "XSA_MGR";
privileges
in
migrated
DU

```

## Migration

In this step, we will see how to use the migration assistance tool.

1. Unzip the migration tool downloaded from SAP download portal, it will look like shown below.



2. Open the CMD on your desktop where migration tool is downloaded and navigate to xs-migration tool folder.
3. Get the host name or IP of the source HANA system and index server SQL port number. You can use below SQL to get the host name and SQL port of the system. `SELECT HOST FROM M_CONNECTIONS WHERE CONNECTION_ID = CURRENT_CONNECTION;`

```

SELECT SERVICE_NAME, PORT, SQL_PORT, (PORT + 2) HTTP_PORT FROM
SYS.M_SERVICES
WHERE ( SERVICE_NAME = 'indexserver' and COORDINATOR_TYPE =
'MASTER' ) or SERVICE_NAME = 'xsengine';

```

4. If source system is on or higher than SAP HANA 1.0 SPS 11 then use below commands in the CMD (For Windows systems use 'Set' and for Linux systems use 'Export'): Set  
`HANA_HOST=HANA_source_system_host_nameSet`

```
HANA_SQL_PORT=HANA_source_SQL_Port_numberSet
HANA_USER=XSA_MGRSet HANA_PASSWD=Passwordxs-
migration.bat -target-dir C:\result DU_XSA_MIGRATION
Note: Make sure 'result' folder is not available at C:\\. System will create
this folder while generating the output. If this folder is already available,
then you will get the error 'Target directory "C:\result" does exist.'
```

```
Command Prompt
C:\XS_MIGRATION_00_25-70002351\xs-migration>Set HANA_HOST= [REDACTED]
C:\XS_MIGRATION_00_25-70002351\xs-migration>Set HANA_SQL_PORT= [REDACTED]
C:\XS_MIGRATION_00_25-70002351\xs-migration>Set HANA_USER= [REDACTED]
C:\XS_MIGRATION_00_25-70002351\xs-migration>Set HANA_PASSWD= [REDACTED]
C:\XS_MIGRATION_00_25-70002351\xs-migration>xs-migration.bat --target-dir C:\result DU_XSA_MIGRATION
```

Based on the number of objects, it will take some time to complete the process. Once process is completed, you will see below message.

```
Total calculation view and analytic privilege files: 2 successful: 2 failure: 0
Migration of Calviews finished with success
Generating Synonyms for database artifacts
Generating descriptors
Post-Processing finished
Writing report data
Report url: C:\result\report.html
Migration finished.

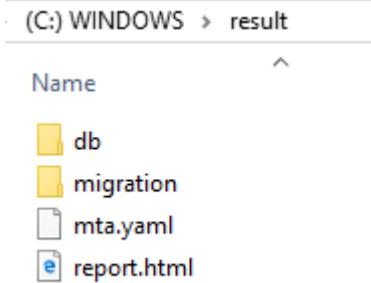
The following referenced objects are outside of the migration context and cannot be referenced by synonyms:
[REDACTED]

Global Context written to: C:\result\migration\globalContext.json
[-] [#####
[Step 19/19]
C:\XS_MIGRATION_00_25-70002351\xs-migration>
```

There are more options which can be used with xs-migration.bat statement. Please refer below link to find more options.

<https://help.sap.com/viewer/58d81eb4c9bc4899ba972c9fe7a1a115/2.0.04/en-US/2a4f5f4ac28942d39c3875fea2ddbb3f.html>

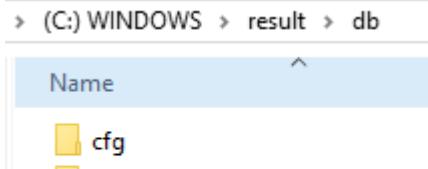
## 5. Go to the C:\result

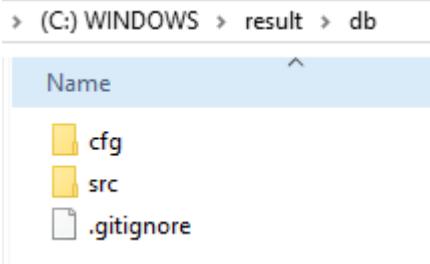


## 6. In 'report.html' file you can find all the logs, success, warning and error messages. Use the below link to learn more about reading report.

<https://help.sap.com/viewer/58d81eb4c9bc4899ba972c9fe7a1a115/2.0.04/en-US/c9ae88eb263c4da7a52e7682d55474de.html>

## 7. Go to db -> src folder. Under the src folder you can find all the objects from your source system converted into XSA compatible objects





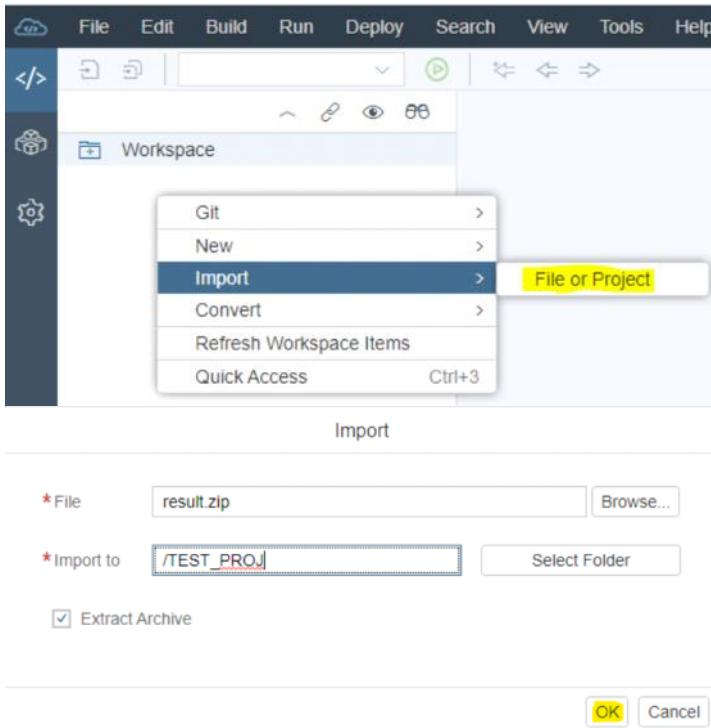
## Import Project into WebIDE

In this step, we will import the project into WebIDE and do the necessary adjustments.

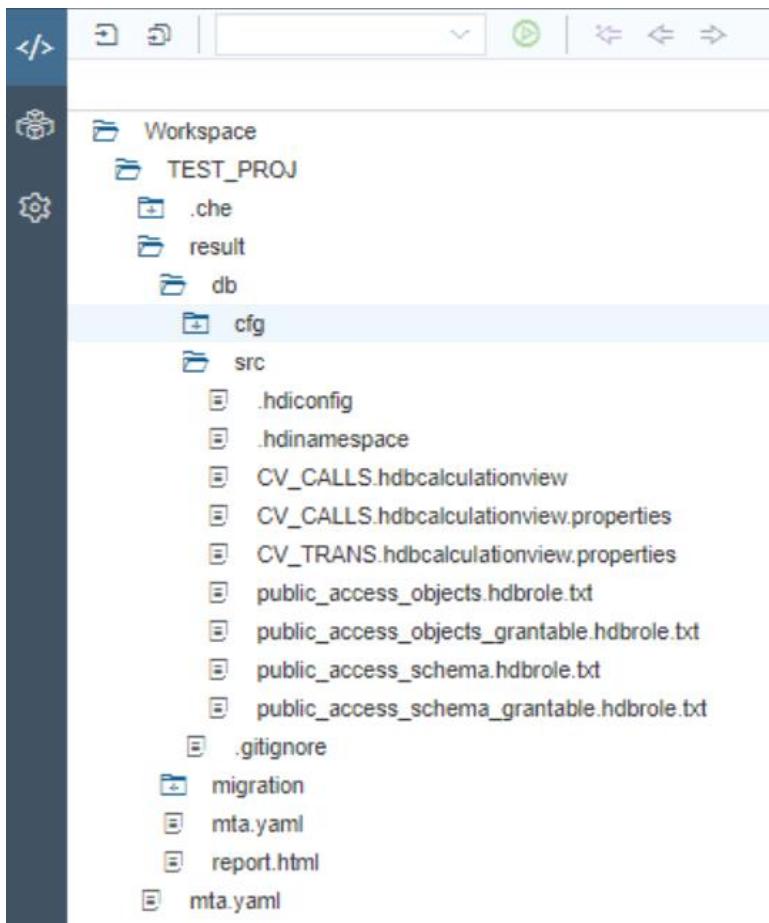
1. Add to the result folder to .zip.



2. Login to your XSA webide, right click on the 'Workspace' and import the result.zip folder. In the 'Import to' field you can provide the XSA project name then click on OK.



3. Now in project, we can see all the objects are imported in XSA format.



4. Check in the .hdinamespace file, it will have the path of XSC package structure. This path will be used in all the objects name based on the "subfolder" settings. This will be derived from XSC project package names and structure.

CV\_CALLS.hdbcalculationview x

Semantics

[View Properties](#) [Columns \(19\)](#) [Parameters \(0\)](#)

[General](#) [Advanced](#)

|                |                       |
|----------------|-----------------------|
| Name:          | abc.xyz.123::CV_CALLS |
| Label:         | CV_Calls              |
| Notes:         |                       |
| Type:          | STANDARD              |
| Data Category: | DIMENSION             |

5. Note: This is not the recommendation; it is only suggestion. In my projects, I do not use the imported project. I generally create new project and then import objects into new project and change the names for these objects as per new project namespace. In this case, I have created 'Project\_ABC' project with ABC\_DB database module. In this way I can manage the project using new folder structure in XSA.

```

1 ID: Project_ABC
2 _schema-version: '2.1'
3 version: 0.0.1
4
5 modules:
6 - name: ABC_DB
7   type: hdb
8   path: ABC_DB
9   requires:
10  - name: hdi_ABC_DB
11
12 resources:
13 - name: hdi_ABC_DB
14   parameters:
15     config:
16       schema: SXABC
17   properties:
18     hdi-container-name: ${service-name}
19   type: com.sap.xs.hdi-container

```

Note: Try to keep the database module separate for every project. If you use the same DB name in all the project, then you will face issues when you will deploy the projects with same DB module name in same space. First project will get deployed successfully but when you will try to deploy the second project it will fail. Second project will try to create DB service name which is already created by first project. In this case DB service name is 'hdi\_ABC\_DB'. Same is the case with the schema name. Try to keep it different.

6. Copy the objects from imported project to newly created project and then change the name for these objects and also change or replace the namespace inside the objects wherever it is required. Start with base level objects like tables and then gradually go up like flowgraphs, calculation views and role etc. You can also do it opening the object in SQL or JSON and use the Find and Replace functionality and then save. If you have changed the namespace for tables then you will also have to change the table names in all the places where they are used.

Example: In case of calculation view name can be changed from Semantics and then 'Refactor' it. To change the tables used in the calculation view you can user the 'Replace Datasource' functionality.

```

1 ID: Project_ABC
2 _schema-version: '2.1'
3 version: 0.0.1
4
5 modules:
6 - name: ABC_DB [Pending Deployment]
7   type: hdbcalculationview
8   path: ABC_DB
9   requires:
10  - name: hdi_ABC_DB
11
12 resources:
13 - name: CV_CALLS.hdbcalculationview [Pending Deployment]
14   parameters:
15     config:
16       schema: SXABC
17   properties:
18     hdi-container-name: ${service-name}
19   type: com.sap.xs.hdbcalculationview

```

CV\_CALLS.hdbcalculationview x

Semantics

[View Properties](#) [Columns \(19\)](#) [Parameters \(0\)](#)

[General](#) [Advanced](#)

Name: abc.xyz.123::CV\_CALLS

Label: CV\_Calls

Notes:

Type: STANDARD

Data Category: DIMENSION

Refactor Views

| Type                                   | List of impacted views | Refactor Su... |
|----------------------------------------|------------------------|----------------|
| Project_ABC.ABC_DB.Calc_View::CV_CALLS |                        |                |

References in listed impacted views will be automatically adjusted

[Refactor](#) [Cancel](#)

## Data Migration

To migrate the Data from existing XSC tables to XSA tables you can use different methods.

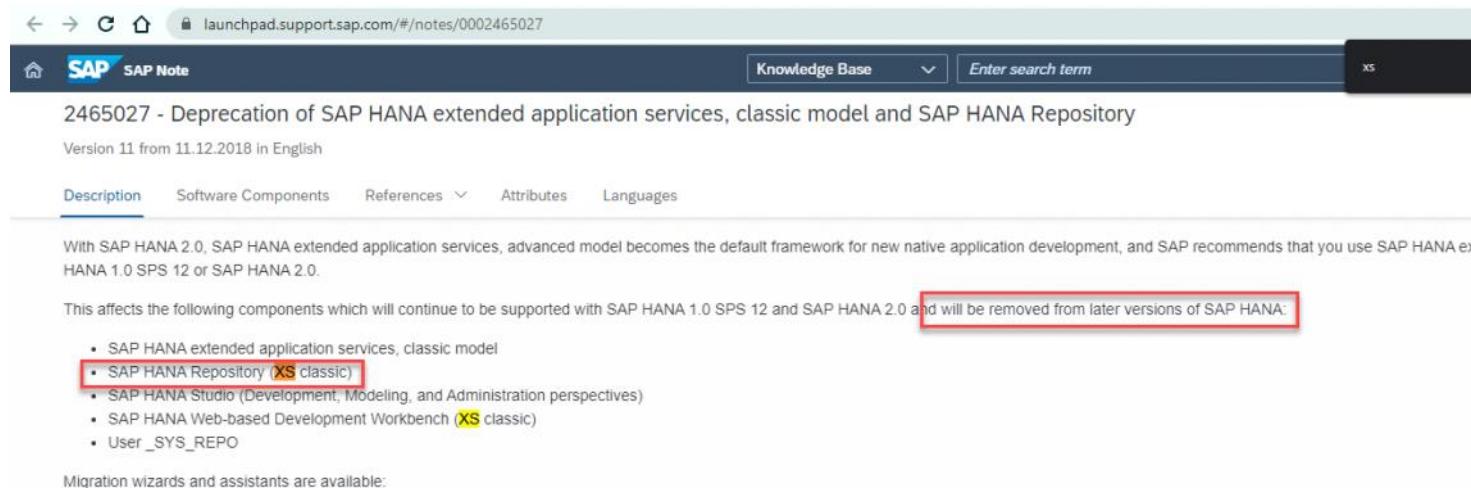
1. Download the data into CSV file and then load the data from CSV files into HANA XSA tables.
2. Create the SDA or SDI connections from source XSC system to XSA system; create flowgraph and load the data.
3. Use other ETL tools like data services or Talend to load the data from source to Target.

I hope this blog post will help you to understand the difference between HANA XSC and XSA and It will helpful for you to migrate your existing XSC applications to HANA XSA.

# XSC XS classic deprecated

Wednesday, April 14, 2021 11:22 AM

<https://launchpad.support.sap.com/#/notes/0002465027>



The screenshot shows a SAP Knowledge Base page for note 2465027. The title is "2465027 - Deprecation of SAP HANA extended application services, classic model and SAP HANA Repository". It's a Version 11 note from 11.12.2018 in English. The "Description" tab is selected. A red box highlights the note content: "With SAP HANA 2.0, SAP HANA extended application services, advanced model becomes the default framework for new native application development, and SAP recommends that you use SAP HANA ext HANA 1.0 SPS 12 or SAP HANA 2.0." Below this, a list of components affected by deprecation is shown, with "SAP HANA Repository (XS classic)" highlighted by a red box. A note at the bottom states: "This affects the following components which will continue to be supported with SAP HANA 1.0 SPS 12 and SAP HANA 2.0 and will be removed from later versions of SAP HANA:" followed by a list of components.

[https://twitter.com/thomas\\_jung/status/1273236406450692096?s=20](https://twitter.com/thomas_jung/status/1273236406450692096?s=20)



A Twitter post from Thomas Jung (@thomas\_jung) replying to @\_nzamani. The text reads: "XSC is clearly deprecated (documented in a service note) and already removed from HANA As A Service and HANA Cloud." The post was made at 7:49 AM · Jun 17, 2020 · Twitter Web App.

<http://methodsys.com/sap-hana-xsc-xsa/>



Another one bites the dust... The trend now seems clear. When SAP starts referring to one of its applications with the prefix "Classic" that means that the application is now being seen through the rearview mirror by its development team. At the same time, a new application is launched replacing the classic one and carrying usual prefixes like Smart, Advanced or Simplified.

The classic application is therefore, as SAP puts it, deprecated. No further development effort will be directed to it. New development and features will be directed to the new kid on the block...

This is exactly what is happening with SAP HANA Extended Application Services Classic (XSC). SAP launched its replacement with SAP HANA 1.0 SPS 11 and named it SAP HANA Extended Application Services Advanced (XSA). In SAP HANA 2.0, XSA has become the framework recommended as default by SAP for new native application development.

The catch is that with it the following components were also incorporated to the "Classic" list:

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

# Webide role not created

Thursday, April 22, 2021 9:29 AM

|                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="https://launchpad.support.sap.com/#/notes/2569879">https://launchpad.support.sap.com/#/notes/2569879</a>                                                                                                                                                                      | "You are not authorized to access SAP Web IDE" when accessing SAP Web IDE for HANA<br><br>From < <a href="https://launchpad.support.sap.com/#/notes/2569879">https://launchpad.support.sap.com/#/notes/2569879</a> >                          |
|                                                                                                                                                                                                                                                                                        | 2871926 - SAP Web IDE for SAP HANA 2.0 SPS 05 - Central Release Note<br><br>From < <a href="https://launchpad.support.sap.com/#/notes/2871926">https://launchpad.support.sap.com/#/notes/2871926</a> >                                        |
| Set Up Role Collections<br><br>From < <a href="https://help.sap.com/viewer/a6e85810ac204660a019bff89b8181b0/2.0.04/en-US/d05825e06ad246769ee7adaaa76713d5.html">https://help.sap.com/viewer/a6e85810ac204660a019bff89b8181b0/2.0.04/en-US/d05825e06ad246769ee7adaaa76713d5.html</a> >  | <a href="https://help.sap.com/viewer/a6e85810ac204660a019bff89b8181b0/2.0.04/en-US/d05825e06ad246769ee7adaaa76713d5.html">https://help.sap.com/viewer/a6e85810ac204660a019bff89b8181b0/2.0.04/en-US/d05825e06ad246769ee7adaaa76713d5.html</a> |
| Manage the SAP Web IDE Roles<br><br>From < <a href="https://help.sap.com/viewer/4505d0bdaf4948449b7f379d24d0fd/2.0.03/en-US/09749275442f47a5877d91b932fe948a.html">https://help.sap.com/viewer/4505d0bdaf4948449b7f379d24d0fd/2.0.03/en-US/09749275442f47a5877d91b932fe948a.html</a> > |                                                                                                                                                                                                                                               |

# Thomas jung SAP HANA BASCIS for developers

Thursday, April 22, 2021 4:30 PM

## SAP HANA Basics For Developers



Code samples :-

<https://github.com/SAP-samples/hana-xsa-opensap-hana7>

|                                                                                                                             |                                                                   |                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="https://github.com/SAP-samples/hana-xsa-live-reporting">https://github.com/SAP-samples/hana-xsa-live-reporting</a> | OPERATIONAL REPORTING with DEMO DATA- WE CAN USE FOR DEMO purpose | <a href="https://developers.sap.com/tutorials/haas-ecc-operational-reporting-sample-data.html">https://developers.sap.com/tutorials/haas-ecc-operational-reporting-sample-data.html</a> |
|                                                                                                                             |                                                                   |                                                                                                                                                                                         |

<https://github.com/jung-thomas>

[https://sapuxhbd.tcc.etn.com:51010/xsodata/BusinessPartner.xsodata/BusinessPartnerSet?\\$format=json](https://sapuxhbd.tcc.etn.com:51010/xsodata/BusinessPartner.xsodata/BusinessPartnerSet?$format=json) WORKING

# XSA Server access

Sunday, April 11, 2021 8:15 AM

## CONFIDENTIAL] 🚀 SAP HANA XSA Server Subscription

Inbox



**Server Suppport** 5:18 AM (2 hours ago)

to me, Anubhav

Dear Hari,

Thanks for payment, We confirm the receipt of the same.

Here is your XSA server subscription details:-

On your windows run command, type **mstsc** (Remote desktop connection)

RDC IP :- [103.207.171.202:3390](https://103.207.171.202:3390)

User Name:- **xsa**

Password:- **welcome@12**

End date of the subscription is **09-Apr-2021**

--

**Thanks and Regards,**

**Server Team**

<https://www.anubhavtrainings.com/>

*Follow Excellence with Sheer passion*

From <<https://mail.google.com/mail/u/0/?shva=1#inbox/ FMfcgxwLtQTZkwSvBKQpRCzJBBfxJZTn>>

# TEST system

Tuesday, April 13, 2021 12:44 PM

Uid : HARIVN  
Pwd :- Harivn1981

<https://hxsa:53075/watt/index.html>

<https://hxsa:30030/>

\*\*\*\*\*

XSA Portal :- <https://hxsa:30030/>

User:- XSA\_admin

Password:- Abcd1234 (A caps)

\*\*\*\*\*

## HANA DB Details

Host Name:- hxsa

Instance No:- 00

User;- xsa\_admin

Password:- Abcd1234 (A caps)

## HANA DB Details

Host Name:- hxsa

Instance No:- 00

User;- cockpit\_admin

Password:- Abcd1234 (A caps)

### Add Database

Database Type: SAP HANA Database

\*Host:

\*Identifier:  Instance number   
 Port number

\*User:

\*Password:

Save password (stored in the SAP HANA secure store)  
 Connect to the database securely using TLS/SSL (prevents data eavesdropping)  
 Verify the server's certificate using the trusted certificate below

Advanced Options:

Name to Show in Display:

# GIT code review tool

Friday, April 23, 2021 8:09 PM

<https://www.gerritcodereview.com/>

# XSA Tutorials

Saturday, April 24, 2021 10:39 PM

<https://developers.sap.com/group.hana-xsa-get-started.html>

# SAMPLE Codes and test data - XSA

Saturday, April 24, 2021 10:39 PM

ode samples :-

<https://github.com/SAP-samples/hana-xsa-opensap-hana7>

|                                                                                                                             |                                                                         |                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="https://github.com/SAP-samples/hana-xsa-live-reporting">https://github.com/SAP-samples/hana-xsa-live-reporting</a> | OPERATIONAL REPORTING with<br>DEMO DATA- WE CAN USE FOR<br>DEMO purpose | <a href="https://developers.sap.com/tutorials/haas-ecc-operational-reporting-sample-data.html">https://developers.sap.com/tutorials/haas-ecc-operational-reporting-sample-data.html</a> |
|                                                                                                                             |                                                                         |                                                                                                                                                                                         |

<https://github.com/jung-thomas>

# XSA Tutorials

Tuesday, April 27, 2021 10:17 AM

<https://developers.sap.com/tutorials/xsa-explore-basics.html>

<https://developers.sap.com/group.hana-xsjs-xsodata.html>

Expose Entities Using OData and XSJS with SAP HANA XS Advanced

From <<https://developers.sap.com/group.hana-xsjs-xsodata.html>>

|                                                                                                                                                                                                                                     |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/purchaseOrder.xsodata/POHeader?&amp;\$top=2&amp;\$expand=POItem">https://sapuxhbd.tcc.etn.com:51064/xsodata/purchaseOrder.xsodata/POHeader?&amp;\$top=2&amp;\$expand=POItem</a> | Header and Item |
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/purchaseOrder.xsodata/POHeader">https://sapuxhbd.tcc.etn.com:51064/xsodata/purchaseOrder.xsodata/POHeader</a>                                                                   | Only Header     |
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/purchaseOrder.xsodata/\$metadata">https://sapuxhbd.tcc.etn.com:51064/xsodata/purchaseOrder.xsodata/\$metadata</a>                                                               |                 |
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/\$metadata">https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/\$metadata</a>                                                         |                 |
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/BusinessPartners">https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/BusinessPartners</a>                                             |                 |

# XSA test odata services

Monday, August 2, 2021 6:45 PM

|                                                                                                    |                                                                       |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <a href="#">SAP HANA Basics For Developers Part 8.6 XSODATA Creating a Simple OData V2 Service</a> | Video Thomas Jung video for creating XSODATA service exposing a table |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|

|                                                                                                                                                                                                                                               |                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/\$metadata">https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/\$metadata</a>                                                                   | Business Partners XSODATA            |
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/BusinessPartners?format=json">https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/BusinessPartners?format=json</a>                               | Business Partners <b>JSON</b> format |
| <a href="https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/BusinessPartners?format=json\$top=3\$skip=5">https://sapuxhbd.tcc.etn.com:51064/xsodata/businessPartners.xsodata/BusinessPartners?format=json\$top=3\$skip=5</a> | TOP and SKIP options                 |

|                                                                                               |                  |
|-----------------------------------------------------------------------------------------------|------------------|
| <a href="https://sites.google.com/view/hanaxsa01">https://sites.google.com/view/hanaxsa01</a> | HANA XS training |
|-----------------------------------------------------------------------------------------------|------------------|

|                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="https://blogs.sap.com/2020/07/27/hana-xsa-simplified-4-sap-hana-database-authorization-provisioning-for-hdi-container-roles/">https://blogs.sap.com/2020/07/27/hana-xsa-simplified-4-sap-hana-database-authorization-provisioning-for-hdi-container-roles/</a> | <b>HANA XSA Simplified 4: SAP HANA Database Authorization provisioning for HDI Container roles</b><br><br>From < <a href="https://blogs.sap.com/2020/07/27/hana-xsa-simplified-4-sap-hana-database-authorization-provisioning-for-hdi-container-roles/">https://blogs.sap.com/2020/07/27/hana-xsa-simplified-4-sap-hana-database-authorization-provisioning-for-hdi-container-roles/</a> > |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="https://www.sap.com/documents/2018/04/fe086f0d-fa7c-0010-87a3-c30de2ffd8ff.html">https://www.sap.com/documents/2018/04/fe086f0d-fa7c-0010-87a3-c30de2ffd8ff.html</a> | <b>Best practices and recommendations for developing roles in SAP® HANA</b><br><br>Document Version 1.1 2018-11<br>Public<br><br>From < <a href="https://www.sap.com/documents/2018/04/fe086f0d-fa7c-0010-87a3-c30de2ffd8ff.html">https://www.sap.com/documents/2018/04/fe086f0d-fa7c-0010-87a3-c30de2ffd8ff.html</a> > |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



Lore, Chris Monday 10:00 AM  
<https://github.com/umarelx/SQLScript-101>

```
| Error: authentication failed grantor service: "ServiceName_1", type: "sql", user: "CUPS_SFLIGHT"
```

We need to create the SFLIGHT technical user and role in the pointed tenant database:

```
-- create user
CREATE USER CUPS_SFLIGHT PASSWORD "*****" SET PARAMETER CLIENT = '001';
ALTER USER CUPS_SFLIGHT DISABLE PASSWORD LIFETIME;
GRANT SELECT ON SCHEMA SFLIGHT TO CUPS_SFLIGHT WITH GRANT OPTION;
GRANT SELECT METADATA ON SCHEMA SFLIGHT TO CUPS_SFLIGHT WITH GRANT OPTION;

-- create role
CREATE ROLE SFLIGHT_CONTAINER_ACCESS;
GRANT SELECT, SELECT METADATA ON SCHEMA SFLIGHT TO SFLIGHT_CONTAINER_ACCESS WITH GRANT OPTION;
GRANT SFLIGHT_CONTAINER_ACCESS TO CUPS_SFLIGHT WITH ADMIN OPTION;
```

That's the error I get when trying to build my DB

I think the user was setup incorrectly to begin with. May just need a DBA for a few minutes to test it out.

and switch to a single user instead of using two like the older models talk about

I'd find the associated training to the bighub I just linked and work through that to test out the model

Monday 10:02 AM

ok



Lore, Chris Monday 10:03 AM  
that training was updated ~30 days ago so hopefully it's much closer to our environment

initial builds were two years ago

Please also put in an OSS note with SAP about the HANA service from XSA.

from the wizard

and it seems like the issue is that the port is not being set correctly

<https://github.com/umarelx/SQLScript-101>

# HBI and HBD servers

Monday, August 30, 2021 8:27 AM

sapuxhbldb.tcc.etn.com:30015

sapuxhbddb.tcc.etn.com:30015

sapuxhbldb.tcc.etn.com

Need to be able to grant others access to role to get access to schema :-

**SAP HANA Studio Workspace - /Security/Users/E9811861 System: BWD@HBD Host: sapuxhbldb.tcc.etn.com Instance: 00 Connected User: E9811861 System Usage: Development System - SAP HANA Studio**

**User Parameters**

**E9811861**

Disable ODBC/ODBC access

**Authentication**

Password:  Confirm:   SAML  SAP Logon Ticket

Force password change on next login: Yes  No

Kerberos  X509  SAP Assertion Ticket

External ID:

Valid From: April 21, 2021 9:13:03 AM GMT-05:00 Valid Until:

Session Client:

**Granted Roles** **System Privileges** **Object Privileges** **Analytic Privileges** **Package Privileges** **Application Privileges** **Privileges on Users**

| Role                                    | Grantor  |
|-----------------------------------------|----------|
| eaton.security.roles:xxdevelopment_role | SYS_REPO |
| PUBLIC                                  | SYS      |

**Details for 'eaton.security.roles:xxdevelopment\_role'**

Grantable to other users and roles

Could you check this? I need to be able to Grant users access to the schema. This is required for hdpgrands file. Once this works, we can create a separate role with specific Schema. But this is required.

**Problems** **Properties** **History** **Job Log** **SAP HANA Communication Log**

1 error, 2 warnings, 0 others

Description

- Errors (1 item)
- Warnings (2 items)

Resource Path Location Type

System ID: HBI (E9811861), sapuxhbldb.tcc.etn.com

Change ID:

Change Status

# SHINE XSA

Thursday, September 9, 2021 10:30 AM

[9:55 AM] Lore, Chris

Yeah I'd like to have a sandbox

[9:55 AM] Lore, Chris

with everything setup

[9:55 AM] Lore, Chris

and SHINE installed

[9:56 AM] Lore, Chris

[https://help.sap.com/doc/13ff61e61a8f442090e27050dc61f019/2.0.03/en-US/SAP\\_HANA\\_Interactive\\_Education\\_SHINE\\_for\\_SAP\\_HANA\\_XS\\_Advanced\\_en\\_HANA2SPS03.pdf](https://help.sap.com/doc/13ff61e61a8f442090e27050dc61f019/2.0.03/en-US/SAP_HANA_Interactive_Education_SHINE_for_SAP_HANA_XS_Advanced_en_HANA2SPS03.pdf)

|                                                                                                |                                    |
|------------------------------------------------------------------------------------------------|------------------------------------|
| C:\Users\e9811861\Downloads>tar -czvf dwt2.tar.gz<br>c:/users/e9811861/Downloads/e9811861_hana | Command to create e<br>tar.gz file |
|------------------------------------------------------------------------------------------------|------------------------------------|

```
{  
    "ServiceName_1":{  
        "object_owner": {  
            "roles": ["eaton.security.roles::xxdevelopment_role"]  
        }  
    },  
    "application_user":{  
        "roles": ["eaton.security.roles::xxdevelopment_role"]  
    }  
}
```

# SAP HANA XS Advanced, Access a classic schema from an HDI container | Tutorials for SAP Developers

Sunday, September 19, 2021 9:25 AM

Clipped from: <https://developers.sap.com/tutorials/xsa-create-user-provided-anonymous-service.html>

Create a user-provided service to access data from a plain or replicated schema from an HDI container

## You will learn

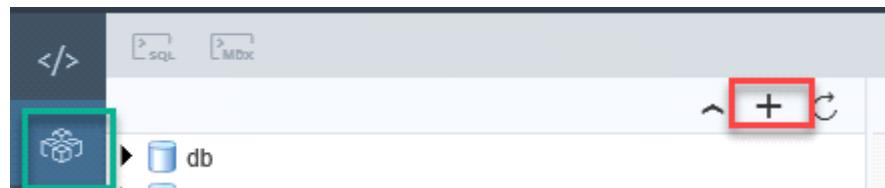
This tutorial will walk you through the integration of a non HDI-managed database, such as a replicated or ABAP database, into an HDI container and how to access it using a SQL anonymous connection.

### Step 1: Load data into a database schema in SystemDB

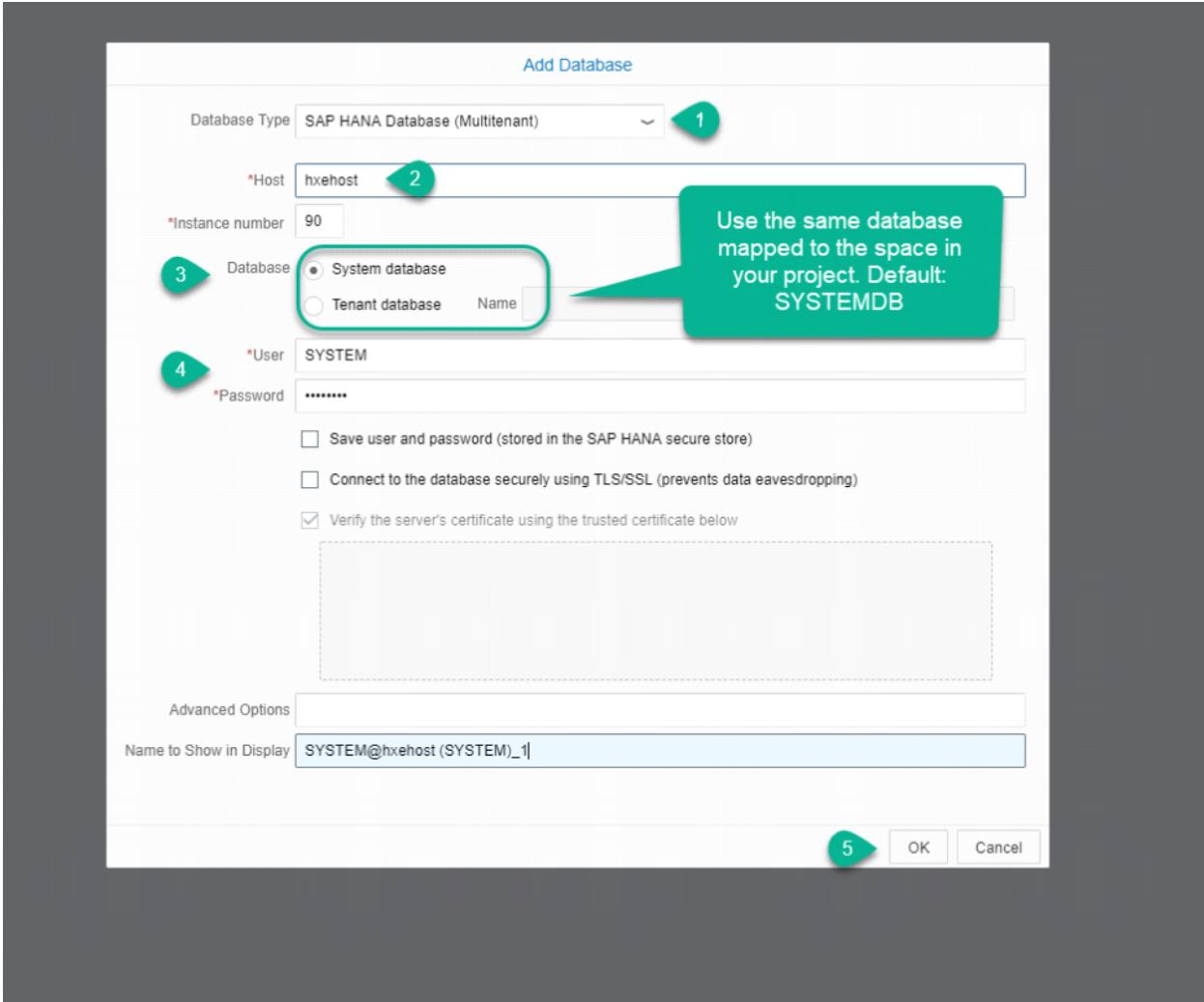
This tutorial needs a replicated database or a schema that is not managed by an HDI container. An example of such schema is an ABAP or ERP database, which you may need to integrate to your XS Advanced development. You will simulate this by creating a schema and importing data into it.

Note: This tutorial will use the default System database in an SAP HANA, express edition instance, which is not the recommended approach for productive development. The space for the project we will be accessing from is also mapped to the system database. Use the same tenant database if your project is in a space mapped to a tenant database.

Begin by connecting to your SAP HANA SystemDB using the + sign in the Database Explorer and choose **SAP HANA Database (Multitenant)**:

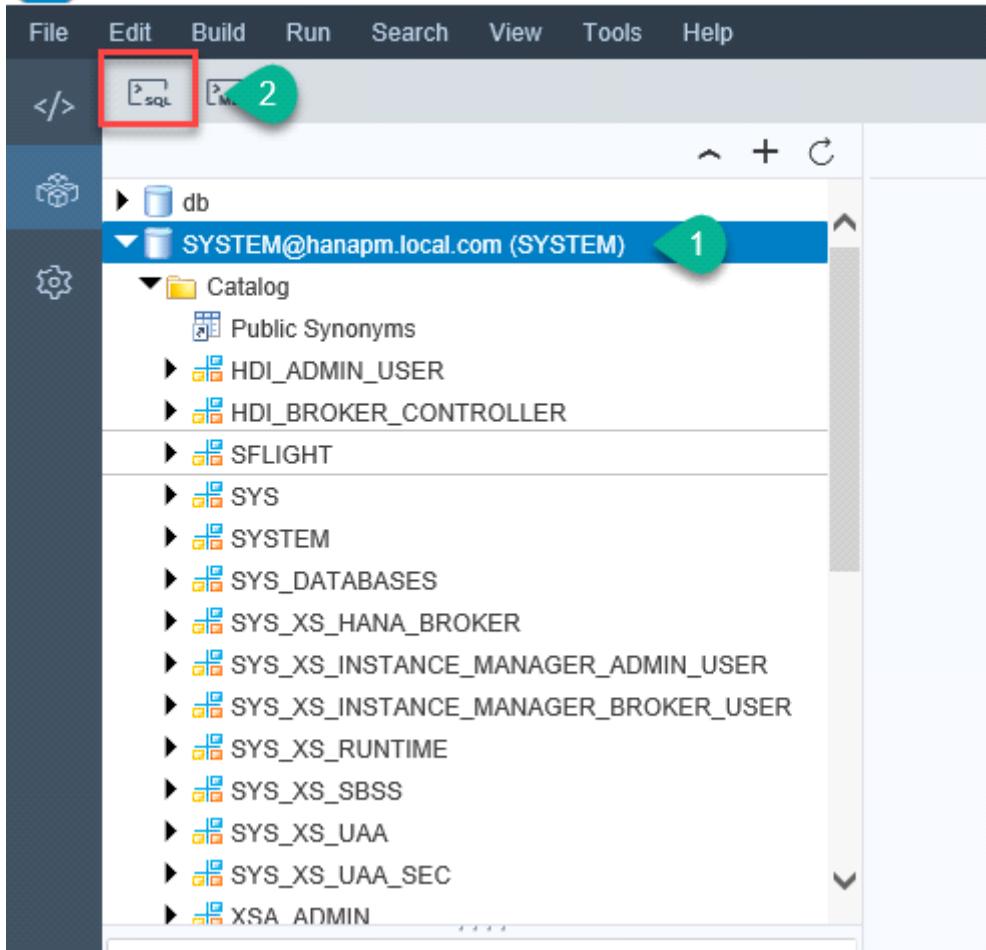


Set the connection parameters to your System database, or the database of your choice. Make sure the selected user has access to the database schema.



Note: Use an appropriate user with the right security restrictions in a productive environment.

You can now see the catalog in your database and open the SQL console:



[Done](#)

Log on to answer question

Step 2: Create a Schema and table and Import data

[View Full Instructions](#)

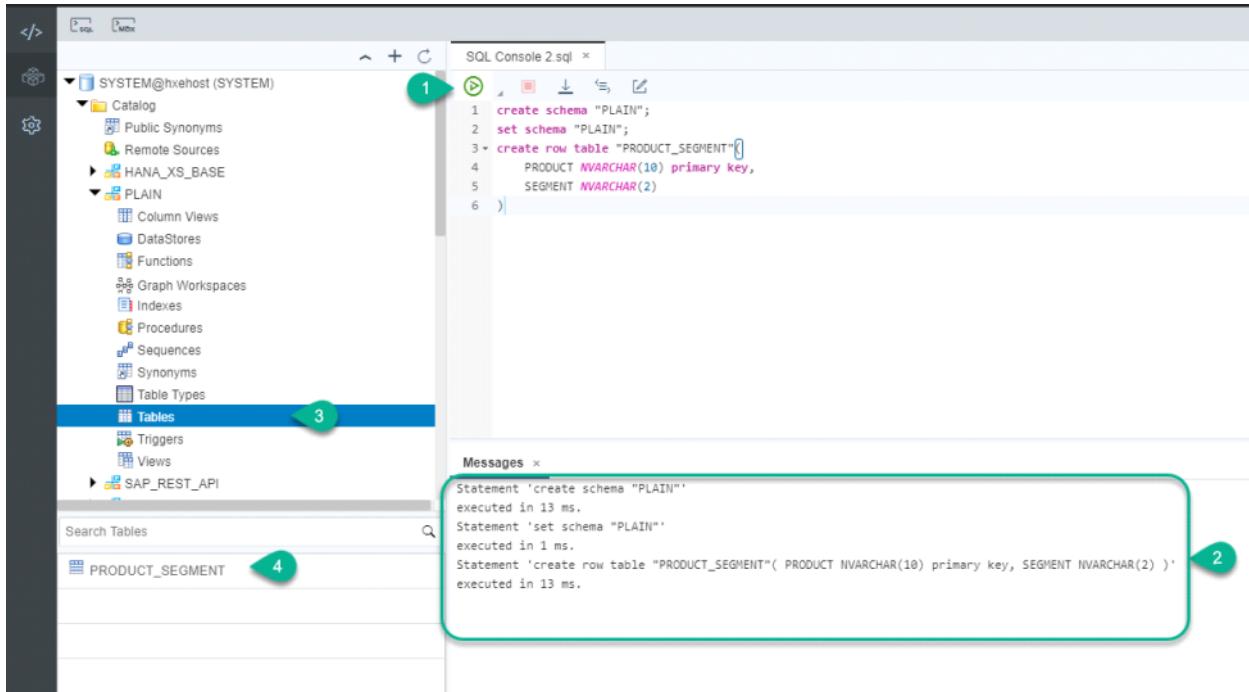
Paste the following code into a SQL console to create a custom schema and a table in it:

sql

Copy

```
create schema "PLAIN";
set schema "PLAIN";
create row table "PRODUCT_SEGMENT"(
    PRODUCT NVARCHAR(10) primary key,
    SEGMENT NVARCHAR(2)
)
```

**Execute** using F8 or the green Run icon on the top of the console and check the results:



Insert data into the newly-created table with the following commands in the SQL console. You can overwrite the previous SQL statement.

sql

Copy

```

INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1001','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1102','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1092','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1007','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1101','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-2028','AB');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-2026','AB');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1091','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-6101','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-6102','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1100','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1003','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1090','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1103','BC');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1000','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1002','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-2027','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-6100','AB');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1004','A');

```

[Done](#)

Log on to answer question

sql

Copy

```
create schema "PLAIN";
set schema "PLAIN";
create row table "PRODUCT_SEGMENT"(
    PRODUCT NVARCHAR(10) primary key,
    SEGMENT NVARCHAR(2)
)
```

sql

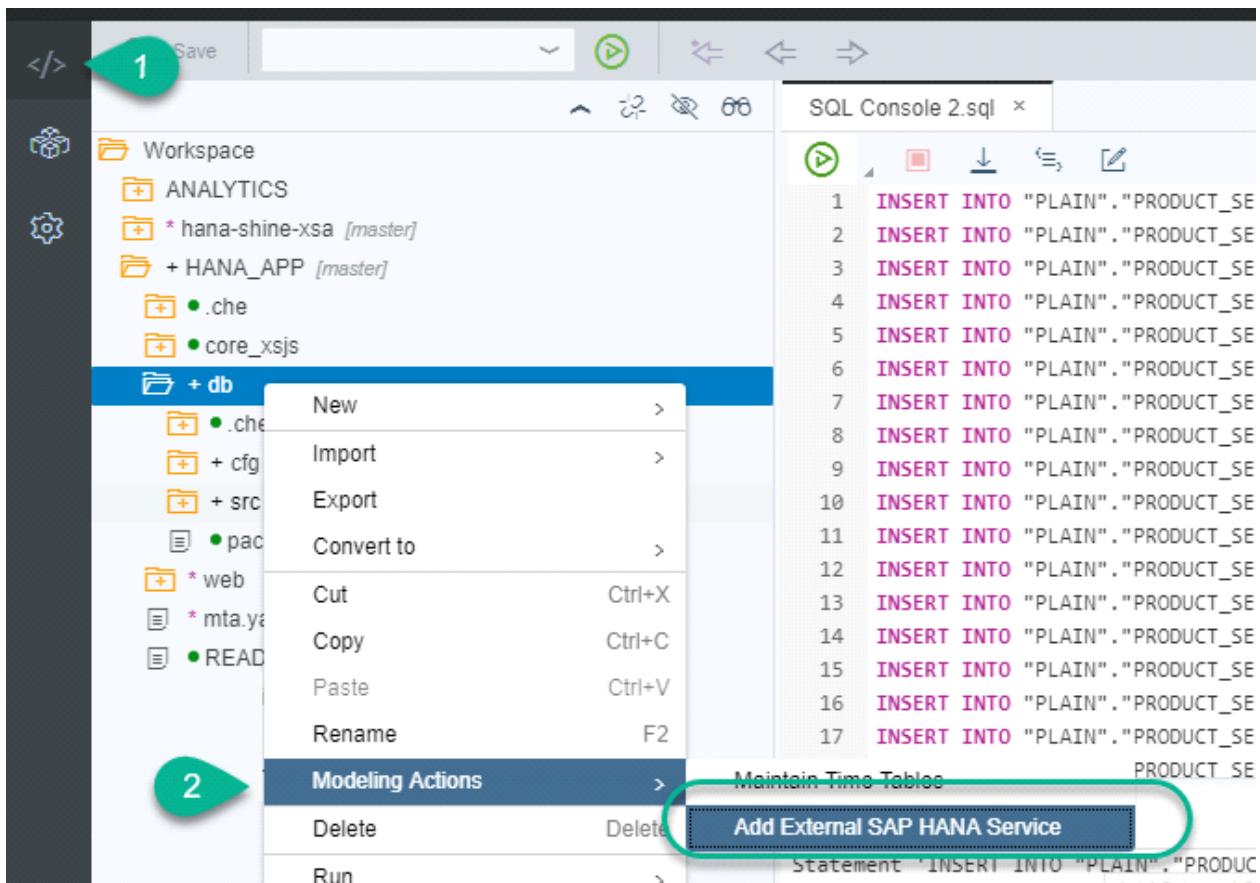
Copy

```
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1001','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1102','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1092','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1007','A');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1101','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-2028','AB');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-2026','AB');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1091','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-6101','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-6102','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1100','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1003','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1090','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1103','BC');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1000','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1002','B');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-2027','C');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-6100','AB');
INSERT INTO "PLAIN"."PRODUCT_SEGMENT" VALUES ('HT-1004','A');
```

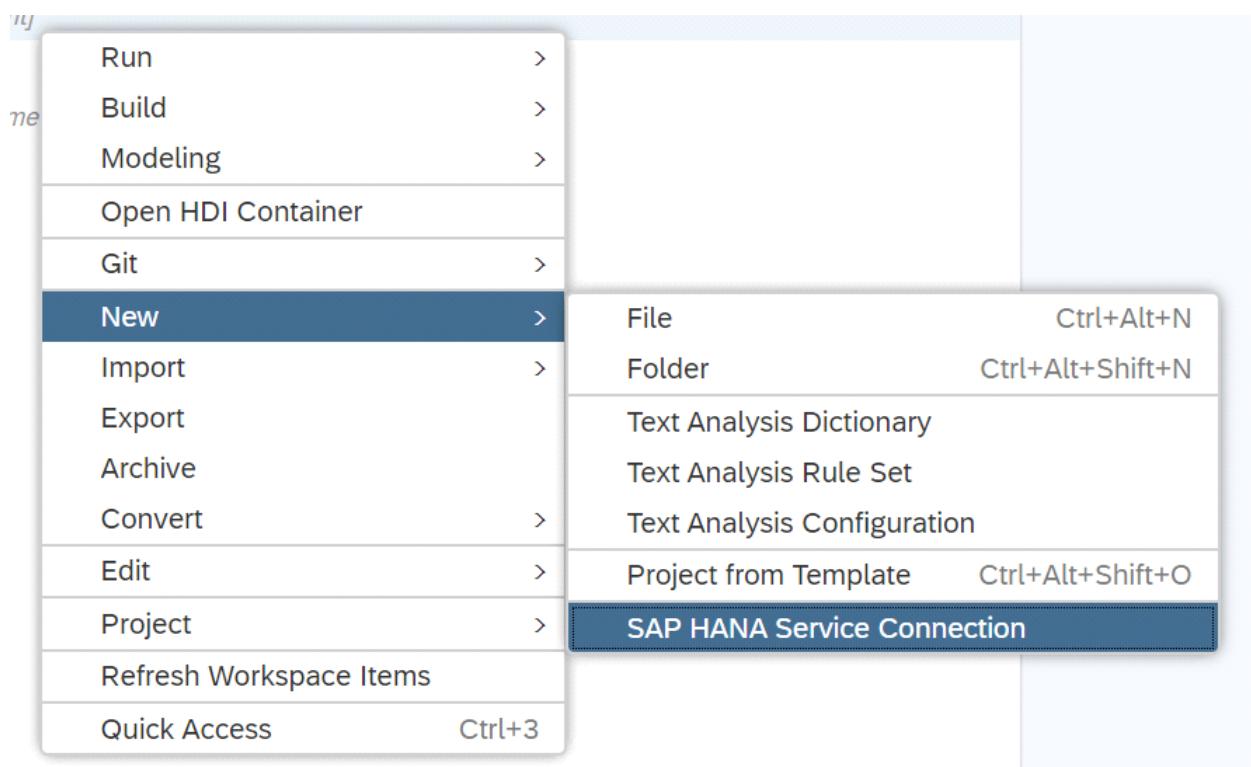
### Step 3: SPS03 - Create a User-Provided service using a wizard

If you are using SAP HANA, express edition SPS03, the process has been simplified and you can now execute a wizard that will complete many of the steps required to access a plain schema from your database module.

Right-click on the database module and choose Modeling actions -> Add external SAP HANA Service Note: In newer versions of the Web IDE, this menu option has changed to New -> SAP HANA Service Connection



or



Use the following values to complete the wizard

- Service name: CROSS\_SCHEMA\_PRODUCTS
- Host: hxehost (or your hostname)
- Port: 39013 (default port for SYSTEMDB in SAP HANA, express edition 2.0,

use 39015 if your space is mapped to the first tenant database)

- User and Password: SYSTEM (or a user with access to the non-container PLAIN schema) and its credentials

Click **Finish**.

[Done](#)

Log on to answer question

Step 4: SPS02 or lower - Create a User-Provided service using the XS CLI

[View Full Instructions](#)

Open a command line to execute a command with the XS client. You will now create a user-provided service called CROSS\_SCHEMA\_PRODUCTS to allow other modules to access the new schema.

Replace the hostname, instance number and port (ending in 13 or 15), user and password in the below command:

ssh

Copy

```
xs cups CROSS_SCHEMA_PRODUCTS -p  
"host","port","user","password","driver","tags","schema"
```

You will be prompted for each of the values you have listed:

- user: SYSTEM
- port: 3XX13 or 3XX15 - where XX stands for the instance number. You can confirm the port by running netstat | grep 3xx13 in the command line in your HXE instance.
- password : The administration password for SYSTEM
- driver: com.sap.db.jdbc.Driver
- tags: [ "hana" ]
- schema: PLAIN

Note: You can also run the command with its parameters as follows

```
xs cups CROSS_SCHEMA_PRODUCTS` -p "{\"host\":\"<hostname>\", \"port\":  
\"3<Instance Number><15|13>\", \"user\":\"<user>\", \"password\":  
\"<Password>\", \"driver\":\"com.sap.db.jdbc.Driver\", \"tags\":[\"hana  
\"] , \"schema\" : \"PLAIN\" }"
```

```

test login: ttt_0ff 0 21.7.0.35 2010
hxeadm@hxehost:/usr/sap/HXE/HDB00> xs cups CROSS_SCHEMA_PRODUCTS -p "host","port","user","password","driver","tags","schema"
host> hxehost
port> 39013
user> system
password>
driver> com.sap.db.jdbc.Driver
tags> [ "hana" ]
schema> PLAIN
Created environment (excerpt):
{
  "name" : "CROSS_SCHEMA_PRODUCTS",
  "credentials" : {
    "schema" : "PLAIN",
    "password" : "*****",
    "driver" : "com.sap.db.jdbc.Driver",
    "port" : "39013",
    "host" : "hxehost",
    "user" : "system",
    "tags" : "[ \"hana\" ]"
  }
}

```

And execute it in a console:

```

hxeadm@hanapm:/usr/sap/HXE/HDB00> xs cups CROSS_SCHEMA_LOCATIONS -p {\"host\":\"hanapm\", \"port\":39013, \"user\":\"SYSTEM\", \"password\":\"*****\", \"driver\":\"com.sap.db.jdbc.Driver\", \
"tags": ["hana"], \"schema\" : \"LOCATION_TEST\" }
Created environment (excerpt):
{
  "name" : "CROSS_SCHEMA_LOCATIONS",
  "credentials" : {
    "schema" : "LOCATION TEST",
    "password" : "*****",
    "driver" : "com.sap.db.jdbc.Driver",
    "port" : "39013",
    "host" : "hanapm",
    "user" : "SYSTEM",
    "tags" : [ "hana" ]
  }
}
hxeadm@hanapm:/usr/sap/HXE/HDB00>

```

Note: You should now be able to add the user provided service as if it were an HDI container in the Database Explorer and see the PRODUCT\_SEGMENTS table with data.

If you get errors at this point, you should verify the user you set in the User-provided service can connect with the same credentials, that the database is enabled for XSA if you are using a tenant (by default, in <https://hxehost:51039/cockpit#/xsa/logicalDatabases>) and the host and port are correct.

[Done](#)

Log on to answer question

ssh

Copy

```
xs cups CROSS_SCHEMA_PRODUCTS -p
"host","port","user","password","driver","tags","schema"
```

```
xs cups CROSS_SCHEMA_PRODUCTS` -p "{\"host\":\"<hostname>\", \"port\": \
\"3<Instance Number><15|13>\", \"user\":\"<user>\", \"password\": \
\"<Password>\", \"driver\":\"com.sap.db.jdbc.Driver\", \"tags\":[\"hana \
\"], \"schema\" : \"PLAIN\" }"
```

Step 5: Check or modify the MTA.yaml file

If you are using SPS03, the entry should have been automatically added into the MTA.yaml file, you will only need to adjust the name of the service.

Add or look for a resource called CROSS\_SCHEMA\_PRODUCTS, type org.cloudfoundry(existing-service).

Use products-service-name and \${service-name} as a key-value pair under properties in **Properties** (\*\*adjust the name if you are using SPS03\*\*).

The screenshot shows the 'Resources' tab selected in the MTA.yaml editor. A new resource named 'CROSS\_SCHEMA\_PRODUCTS' is being created. The 'Type' is set to 'org.cloudfoundry(existing-service)'. In the 'Properties' section, there is a table with one row. The 'Key' column contains 'the-service-name' and the 'Value' column contains '\${service-name}'.

Now add or check the new resource as a requirement for the db module. Add CROSS\_SCHEMA\_PRODUCTS and SERVICE\_REPLACEMENTS under group. Add or check the following key-value pairs:

- key : ServiceName\_1
- service : ~{products-service-name}

The screenshot shows the 'db' module selected in the MTA.yaml editor. Under the 'Requires' section, there is a table with three rows. The first two rows are for 'hd়\_db' and 'cross-container-service-1'. The third row is for 'CROSS\_SCHEMA\_PRODUCTS', which is highlighted with a green circle. The 'Properties' table for 'CROSS\_SCHEMA\_PRODUCTS' has two rows: 'key' with value 'ServiceName\_1' and 'service' with value '~(the-service-name)'.

These are the relevant pieces of the MTA.yaml file. You can see the database module and its dependency to the user provided service.

```
##Other modules and dependencies have been intentionally left out.
```

```
modules:
- name: db
  type: hdb
  path: db
  requires:
    - name: hdi_db
      properties:
        TARGET_CONTAINER: '~{hdi-container-name}'
    - name: CROSS_SCHEMA_PRODUCTS
      group: SERVICE_REPLACEMENTS
      properties:
        key: ServiceName_1
        service: ~{products-service-name}

resources:
- name: CROSS_SCHEMA_PRODUCTS
  properties:
    products-service-name: ${service-name}
  type: org.cloudfoundry(existing-service)
```

**Save** and **Build** the db module.

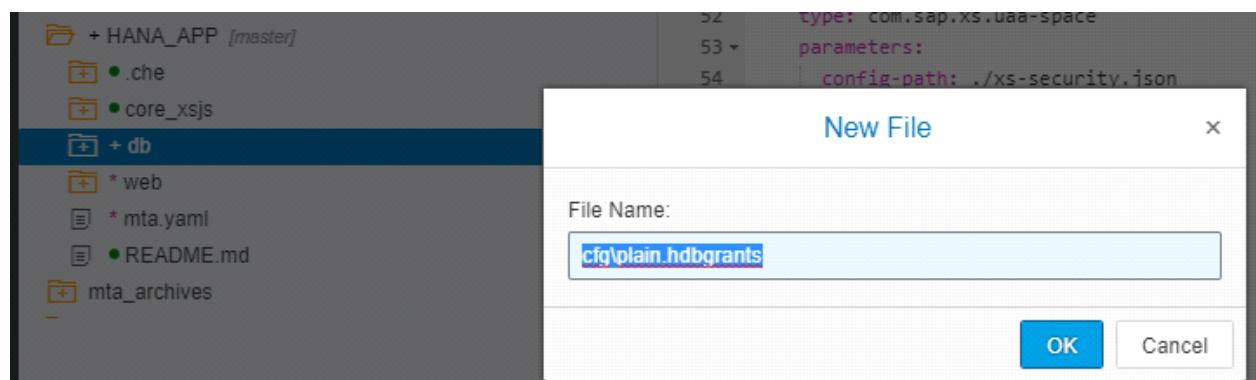
[Done](#)

Log on to answer question

Step 6: Grant privileges to the schema

[View Full Instructions](#)

Create a file called cfg/plain.hdbgrants in the db module. This will create both the folder if it does not exist and the file.



Note: In previous versions of SAP Web IDE for SAP HANA, you may need to create a folder called cfg and then the file in it.

Add the following code:

json

Copy

```
{  
  "ServiceName_1": {  
    "object_owner" : {  
      "schema_privileges": [  
        {  
          "reference": "PLAIN",  
          "privileges_with_grant_option": ["SELECT", "SELECT METADATA"]  
        }  
      ]  
    },  
    "application_user" : {  
      "schema_privileges": [  
        {  
          "reference": "PLAIN",  
          "privileges_with_grant_option": ["SELECT", "SELECT METADATA"]  
        }  
      ]  
    }  
  }  
}
```

**Save** the file.

##What is this?

The user-provided service (through the SYSTEM user. or whatever user you used) is granting permissions to the PLAIN schema, using a GRANT SQL statement. When an HDI container is created, two technical users are created with it. These users will be logging into the HDI container and have permissions to manage the schema. Here you will provide access to the technical user and the application user.

You can find the complete syntax and more examples for the hdbgrants file [in the SAP Help portal](#).

Done

Log on to answer question

json

Copy

```
{  
  "ServiceName_1": {  
    "object_owner" : {  
      "schema_privileges": [  
        {  
          "reference": "PLAIN",  
          "privileges_with_grant_option": ["SELECT", "SELECT METADATA"]  
        }  
      ]  
    },  
    "application_user" : {  
      "schema_privileges": [  
        {  
          "reference": "PLAIN",  
          "privileges_with_grant_option": ["SELECT", "SELECT METADATA"]  
        }  
      ]  
    }  
  }  
}
```

```

    {
      "reference":"PLAIN",
      "privileges_with_grant_option":["SELECT", "SELECT METADATA"]
    }
  ],
},
"application_user" : {
  "schema_privileges": [
    {
      "reference":"PLAIN",
      "privileges_with_grant_option":["SELECT", "SELECT METADATA"]
    }
  ]
}
}
}

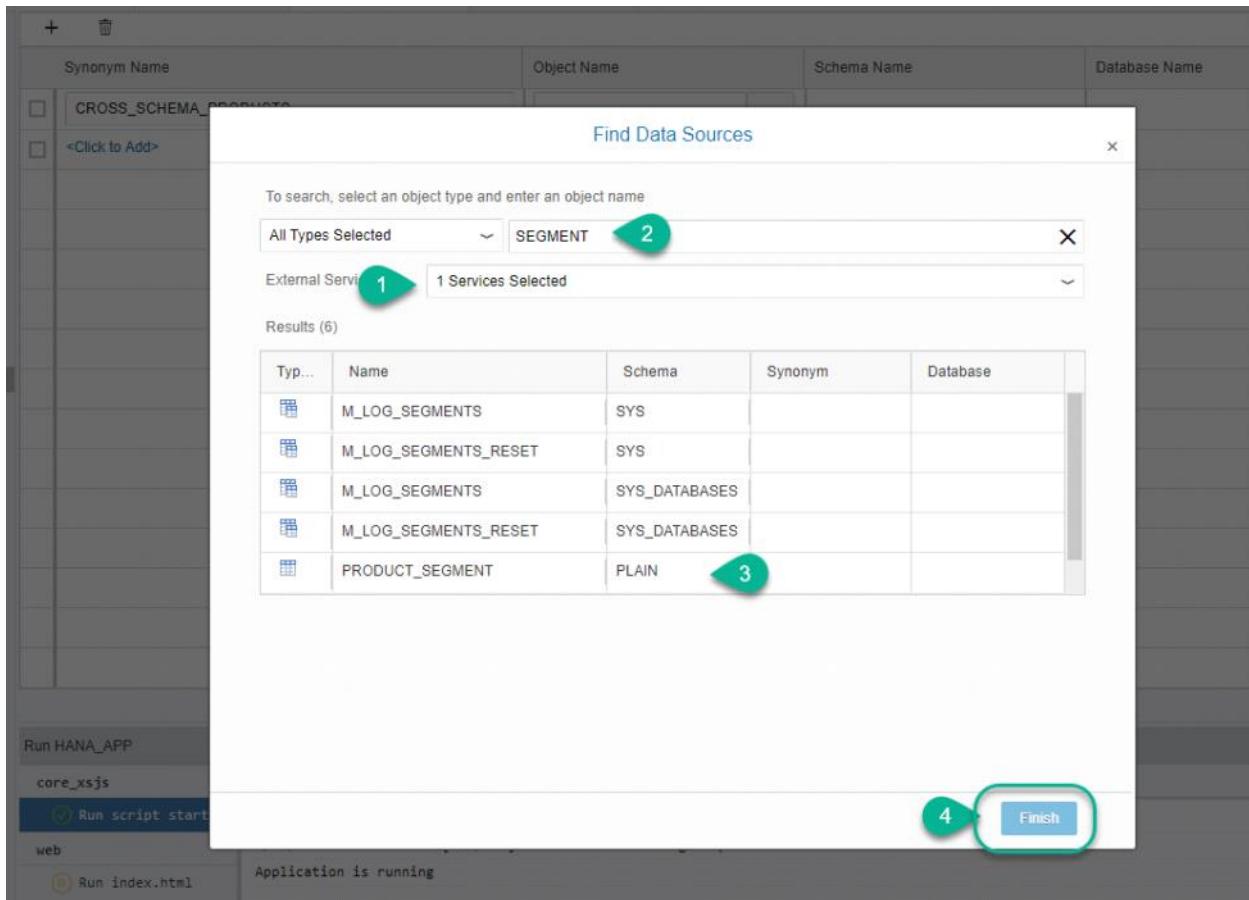
```

### Step 7: Add a synonym

In the src folder, add a file called synonyms/plain.hdbsynonym. Add an entry called PRODUCT\_SEGMENT and use the search button to add the PLAIN schema from the user-provided service.

|                                     | Synonym Name    | Object Name | Schema Name |                                                                                      |
|-------------------------------------|-----------------|-------------|-------------|--------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | PRODUCT_SEGMENT |             |             |  |
| <input type="checkbox"/>            | <Click to Add>  |             |             |  |

Check the user-provided service and look for PRODUCT\_SEGMENTS. Double-click on the table to add it.



**Save** the file.

[Done](#)

Log on to answer question

Step 8: Create a CDS file

[View Full Instructions](#)

Create a new HDB CDS artifact called segments.hdbcards under db/src/data.  
Use the code editor to paste the following code:

sql

Copy

```
using PRODUCT_SEGMENT as P_SEGMENT;
using "PurchaseOrder.Item" as Item;

context segments {

    define view SegmentsView as
        select from P_SEGMENT as S
        join Item as I on S.PRODUCT = I.PRODUCT
    {
```

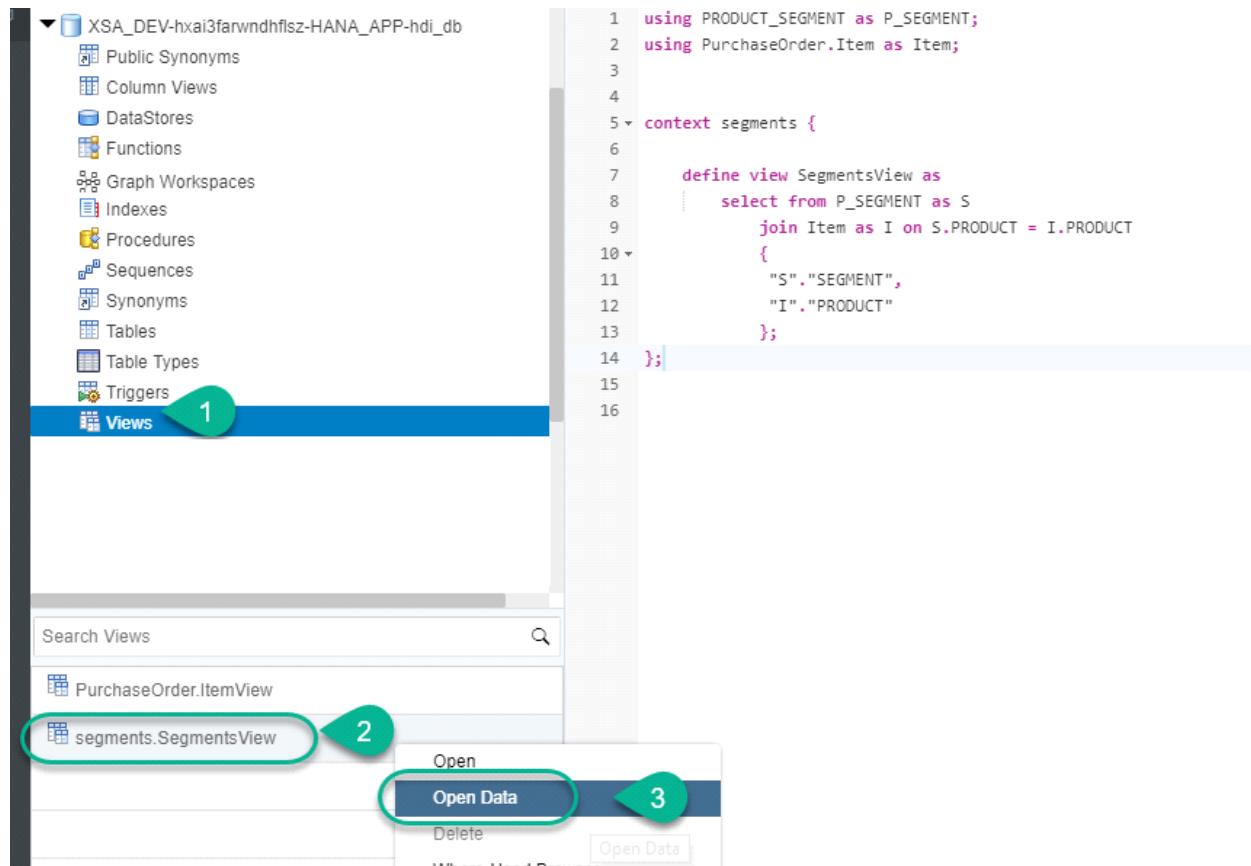
```

    "S"."SEGMENT",
    "I"."PRODUCT"
};

}

```

**Save and Build.** Go into the database explorer and use the option to open data on the view you have just created



Use the results from the data preview to complete the validation below.  
What is the first product that appears in the results?

x

sql

Copy

```
using PRODUCT_SEGMENT as P_SEGMENT;
using "PurchaseOrder.Item" as Item;
```

```
context segments {

    define view SegmentsView as
        select from P_SEGMENT as S
        join Item as I on S.PRODUCT = I.PRODUCT
```

```
{  
    "S"."SEGMENT",  
    "I"."PRODUCT"  
};
```

# XS Advanced features: Synonyms. | SAP Blogs

Sunday, September 19, 2021 10:10 AM

Clipped from: <https://blogs.sap.com/2016/07/03/xs-advanced-features-using-synonyms-using-non-hdi-container-schema-objects-in-hdi-container/>

This blog will give you information on how to use objects of one HDI container into another and objects of a non-HDI container schema into HDI container .

## A word about HDI Containers

As we enter the world of XS Advanced, we come across many new terms and one of them is "HDI container".

You can think of it as a database schema. It abstracts the actual physical schema and provides schema-less development. You can read more about them in the blog written by Thomas Jung. Please visit  
<http://scn.sap.com/community/developer-center/hana/blog/2015/12/08/sap-hana-sps-11-new-developer-features-hdi>

The key points that we need to emphasize while working with the HDI containers are:

- A database schema and a technical user also gets created in the HANA database for every container. All the run time objects from the container like tables, views, procedures etc. sit in this schema and not in the schema bind to your database user.
- All the database object definitions and access logic has to be written in a schema-free way.
- Only local object access is allowed. It means that you can only access the objects local to your container. You can also access the objects of other containers and non-HDI container schemas (foreign schemas) but via synonyms as long as the technical user of the HDI schema has been granted access to this foreign schema.

## 1. Creating Synonyms for non-HDI schema objects

Now we will be looking at an example of creating synonyms for the objects of a non-HDI container schema (foreign schema) in a HDI container.

This example is based on SPS 12 and uses both XS command line tool and SAP Web IDE for SAP HANA (XS Advanced) tool.

## **Prerequisites:**

- You should have a database user who should be able to access XSA Web IDE tool.
- Your database user should have the authorization (WITH GRANT OPTION) on the foreign schema.

Let's start with the example step by step.

### **Create a user provided service.**

We have to create a user provide service for the foreign schema. Open XSA client tools and login using your user by issuing 'xs login' command.

Now create user service by issuing 'xs create-user-provided-service' or 'xs cups' command. You can use the following syntax:

```
xs cups <service-name> -p "{\"host\":\"<host-name>\",\"port\":<port-number>\",\n\"user\":\"<username>\",\"password\":\"<password>\",\"driver\":\n\"com.sap.db.jdbc.Driver\",\\n\"tags\":[\"hana\"], \"schema\":\"<foreign schema name>\" }"
```

### **Modifying mta.yaml file.**

We have to correctly configure all services including the user provided service in the mta.yaml file. This allows using the user provided service within the project.

Add an entry of the user provided service you created in 'resources' section of mta.yaml file.

```
44 resources:\n45 - name: CrossSchemaService\n46   type: org.cloudfoundry(existing-service)\n47   parameters:\n48     service-name: CROSS_SCHEMA_ACCESS_SERVICE
```

**Figure 1: CUPS entry in mta.yaml file example**

Also, add a dependency of this service in HDB module of your project.

```

1 _schema-version: 2.0.0
2 ID: my_project
3 version: 0.0.1
4
5 modules:
6 - name: db
7   type: hdb
8   path: db
9 requires:
10 - name: hdi-container
11 properties:
12   TARGET_CONTAINER: ~{hdi-service-name}
13 - name: CrossSchemaService
14

```

**Figure 2: CUPS dependency in HDB module in mta.yaml file**

### Creating .hdbsynonymgrantor file.

This file specifies the necessary privileges to access external tables. Open XSA Web IDE and under HDB module of your project create a new folder with name 'cfg'. Just like the 'src' folder, its name is special. This tells the HDI deployer that this folder contains configuration files and treats them appropriately.

Create your .hdbsynonymgrantor file under this folder.

```

1 {
2   "CROSS_SCHEMA_ACCESS_SERVICE": {
3     "object_owner" : {
4       "schema_privileges": [
5         {
6           "reference":"MY_SCHEMA",
7           "privileges_with_grant_option":["SELECT"]
8         }
9       ]
10      },
11     "application_user" : {
12       "schema_privileges": [
13         {
14           "reference":"MY_SCHEMA",
15           "privileges_with_grant_option":["SELECT"]
16         }
17       ]
18     }
19   }
20 }

```

**Figure 3: .hdbsynonymgrantor file example**

## **Creating synonym for external object**

Create a .hdbsynonym file in 'src' folder of your HDB module. In one .hdbsynonym file you can define multiple synonyms to be used in your project.

```
1  {
2      "my_project.db.synonyms::Table1": {
3          "target": {
4              "schema": "MY_SCHEMA",
5              "object": "Table1"
6          }
7      },
8      "my_project.db.synonyms::Table2": {
9          "target": {
10             "schema": "MY_SCHEMA",
11             "object": "Table2"
12         }
13     }
14 }
15
16 }
```

**Figure 4: .hdbsynonym file example**

Now, you should be able to use these tables of foreign schema in your container using these synonyms.

## **2. Creating Synonyms for other HDI container objects**

All the steps for creating synonyms for other HDI container objects are very much similar to the above steps with some minor changes.

### **Prerequisites:**

Before you start doing anything please keep in mind that HDI container object privileges can only be granted to other containers via container local roles.

So you have to deploy one or more .hdbrole files defining object privileges to the 'grantor container' (foreign container).

In this scenario we don't have to create CUPS for the other container as a service already exist for that. We can find the name of this service using HRTT tools and checking the details of the HDI container or you check that by issuing 'xs services' command in XSA client tools. The service name should be having your database user and workspace prefixed to it.

### **Modifying mta.yaml file.**

After we have the required service name, we have to modify mta.yaml file.

Add an entry of the user provided service you created in 'resources' section.

```
41 resources:
42 - name: CrossContainerService
43   type: org.cloudfoundry(existing-service)
44 parameters:
45   service-name: MYUSER-90cacgdujwbhlenf-testProject-hdi-container
46
```

**Figure 5: HDI container service entry in mta.yaml file example**

Add a dependency of this service in HDB module of your project.

```
1 _schema-version: 2.0.0
2 ID: my_project
3 version: 0.0.1
4
5 modules:
6 - name: db
7   type: hdb
8   path: db
9 requires:
10 - name: hdi-container
11 properties:
12   TARGET_CONTAINER: ~{hdi-service-name}
13 - name: CrossSchemaService
14 - name: CrossContainerService
15
```

**Figure 6: HDI container service dependency in HDB module in mta.yaml file**

### **Creating .hdbsynonymgrantor file.**

This file specifies the necessary privileges to access tables of other container.

Create your .hdbsynonymgrantor file under 'cfg' folder of your HDB module. You have to reference the local role(s) of the foreign schema in the 'container\_roles' sections of this file.

```
1  {
2      "MYUSER-90cacgdujwbhlenf-testProject-hdi-container": {
3          "object_owner": {
4              "container_roles": ["testProject.roles::my_role"]
5          },
6          "application_user": {
7              "container_roles": ["testProject.roles::my_role"]
8          }
9      }
10 }
11 }
```

**Figure 7: .hdbsynonymgrantor file using container specific roles example**

## Creating synonym

Create a .hdbsynonym file in 'src' folder of your HDB module.

```
1  {
2      "my_project.db.synonyms::Table1": {
3          "target": {
4              "object": "Table1",
5              "schema": "90CACGDUJWBHLENF_TESTPROJECT_HDI_CONTAINER"
6          }
7      },
8      "my_project.db.synonyms::Table2": {
9          "target": {
10             "object": "Table2",
11             "schema": "90CACGDUJWBHLENF_TESTPROJECT_HDI_CONTAINER"
12         }
13     }
14 }
```

**Figure 8: .hdbsynonym file using container specific schema example**

Now you should be able to use the objects of other HDI container using these synonyms.

# Get Started with XS Advanced Development | Tutorials for SAP Developers

Sunday, September 19, 2021 10:10 AM



Get Started with XS Advanced Development | Tutorials for SAP Developers

<https://developers.sap.com/mission.xsa-get-started.html>

Start developing on top of SAP HANA XS Advanced

# Synonyms in HANA XS Advanced, Introduction | SAP Blogs

Sunday, September 19, 2021 10:12 AM

Clipped from: <https://blogs.sap.com/2017/01/06/synonyms-in-hana-xs-advanced-introduction/>

## Why Synonyms?

A complex HANA data warehouse might use several DB schemas in which tables, views and other

DB objects reside. E.g., there might be a replicated ERP schema managed by SLT, a Netweaver/BW schema managed by the Netweaver Stack, and a “native” HANA schema, all residing in the same HANA instance and all of them consumed by the same data warehouse application.

On database level, tables and other DB objects from different schemas can be accessed just by providing the corresponding object privileges to a user. Synonyms can be used for convenience or to improve design, but are not needed.

In XS Advanced (XSA) based HANA data warehouses and applications, development is schema-less. A developer can only access the “local schema” that is generated for the application. Access to objects in other schemas has to be done via private/local synonyms or projection views created in this local schema.

In this series of three blogpost I will introduce the basic concepts, show how synonyms can be used to access objects in a remote schema, and explain the more complex concepts like configuration and service replacement. Even though I focus on HANA data warehouses, this document also applies to the usage of synonyms in XSA application development in general. I will not cover projection views explicitly, but include them in one of the example repos.

An introduction on synonyms in general can be found in <https://blogs.sap.com/2016/12/05/using-synonyms-in-sap-hana/>.

There is also a short introduction, showing some synonym features at <https://blogs.sap.com/2016/07/03/xs-advanced-features-using-synonyms-using-non-hdi-container-schema-objects-in-hdi-container/>.

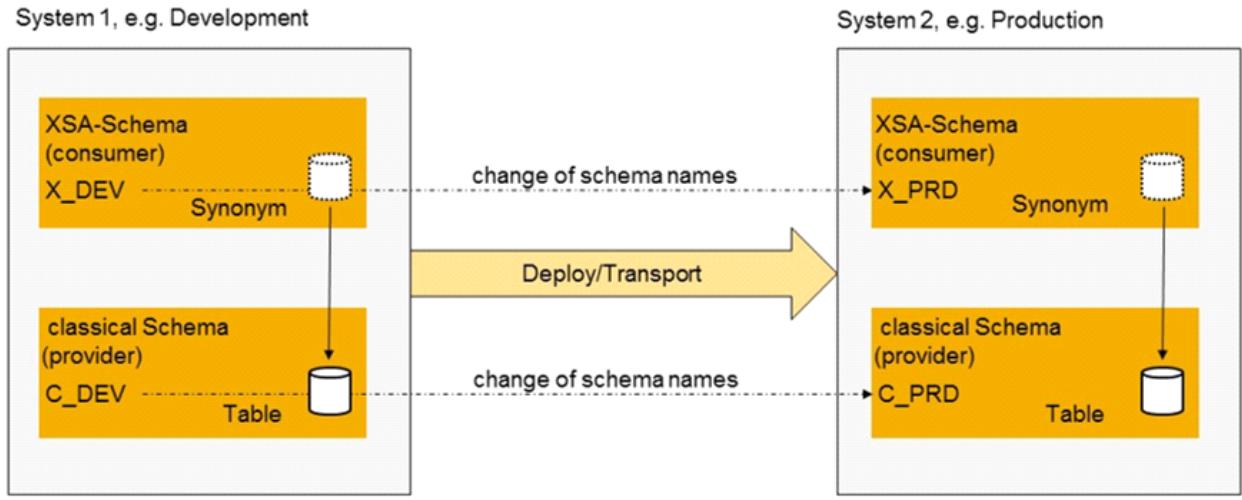
## Use Case

I consider mainly the following use cases:

- Accessing tables owned by a classical schema from a XSA based schema (HDI container), e.g. accessing an existing ERP Schema from XSA
- Accessing tables owned by one XSA based schema from another XSA based schema, e.g. one schema containing data, a different XSA based

- DW application accessing those data
- Transport/deployment to another environment

The following picture shows the principle. Changing the schema names is optional.



## HDI Containers

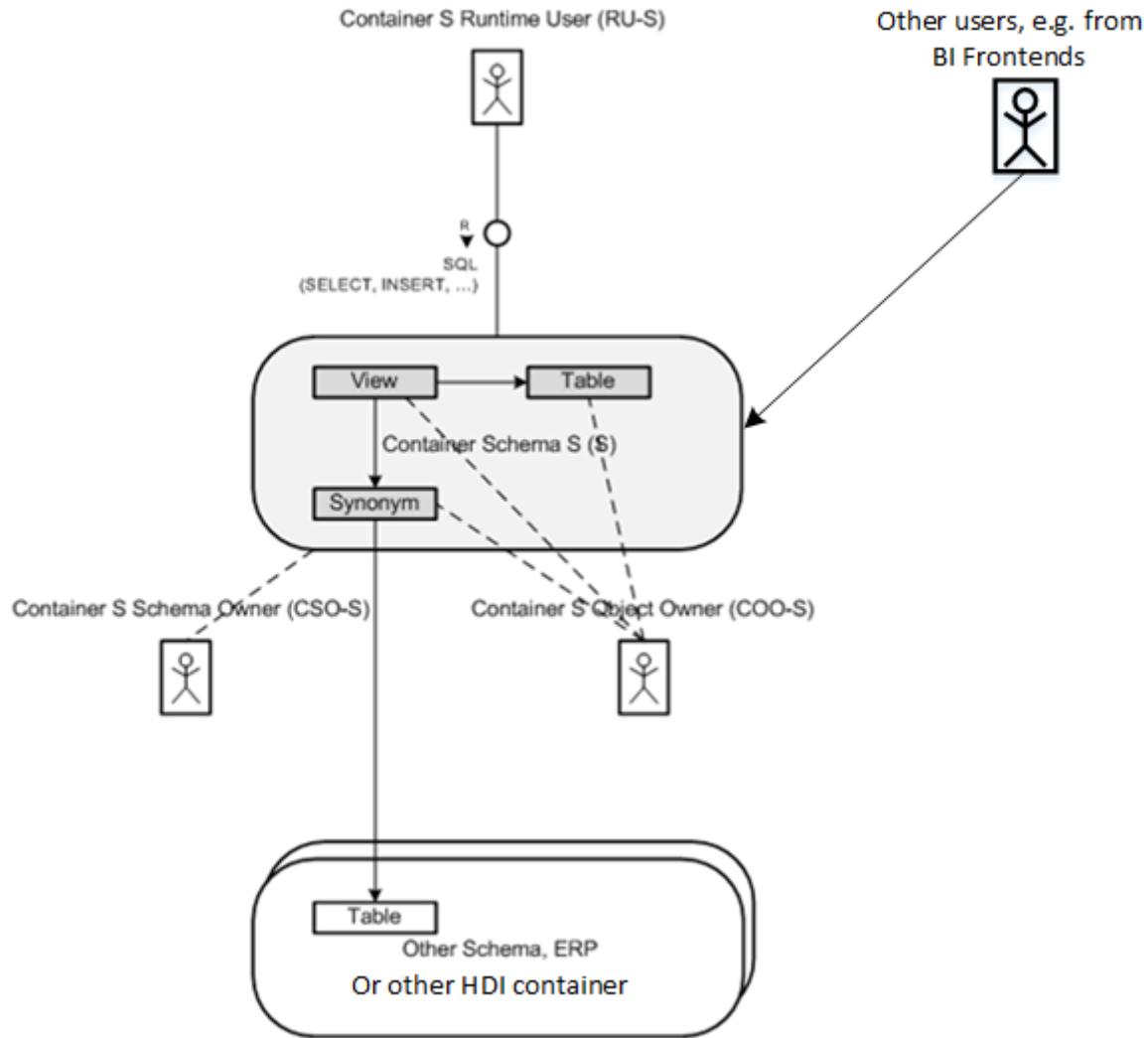
In XSA DB objects reside in an HDI container, which is a generated schema. Development has to be done in a schema-less way. This isolates HDI containers from each other completely and makes it easier to deploy multiple containers into the same system, have several developers work independently from each other etc.. Using synonyms is therefore the designated method to access objects in other schemas.

In a pure SAP BW environment without any native HANA development you might not need this level of isolation. But as soon as native HANA development with multiple development teams becomes part of the use case, the isolation of HDI containers is an extremely powerful security mechanism, superior to the classic repository in that aspect.

Before continuing, we need to understand the object owner and user concept of XSA. Several pre-defined users are generated for each HDI container.

- A schema owner (name of the HDI container/schema)
- An object owner (creates and owns all the objects)
- An application user (also called runtime user, HANA user that runs XSA Applications within the HDI container)
- Some other technical users which we are not interested in here
- Other external user, e.g. from BI Tools

The following picture tries to illustrate different HDI containers/schemas and users involved:



## Prerequisites for Examples

To execute the steps in the coding examples, the following prerequisites apply:

- You are familiar with the basic concepts of XSA, Web IDE and SQL
- You have access to the XS advanced run-time environment
- You have access to SAP Web IDE for SAP HANA
- You have access to the XS command-line interface client
- You have access to a “classical” database schema

Some examples access tables in a classical DB schema. A repository with the description how to generate the schema can be found at <https://github.com/CGilde/syn-prov-classic>.

Some examples access tables in an HDI container. A repository with the description how to generate the schema can be found at <https://github.com/CGilde/syn-prov-hdi>.

The complete coding examples can be found in public github repos at <https://github.com/CGilde>.

All examples were tested on HANA 2.0, but most features are available

already in 1.0 SPS12.

## Simple example

I will finish with the most trivial example I can think of. Probably the most often used public synonym in HANA is DUMMY. Since DUMMY is a **public** synonym pointing to table SYS.DUMMY, for usage in XSA a **private** synonym pointing to table SYS.DUMMY has to be defined first.

Instead of issuing a “CREATE SYNONYM” statement, an .hdbsynonym file is included in the db folder of a project, either by using the graphical editor:

| DUMMY.hdbsynonym |            |             |
|------------------|------------|-------------|
| Synonym Name     | Table Name | Schema Name |
| DUMMY            | DUMMY      | SYS         |

or by including a file:

```
{  
  "DUMMY": {  
    "target": {  
      "object": "DUMMY",  
      "schema": "SYS"  
    }  
  }  
}
```

To keep things simple, no namespace is used (.hdinamespace file with empty name and option “subfolder” : “ignore”).

To test the synonym, a short function is created by including a file TEST\_FUNC.hdbfunction in the db folder of the project. This function uses the newly created synonym DUMMY and can be called from the HANA runtime tools (hrtt).

```
FUNCTION "TEST_FUNC" ()  
  RETURNS table (result NVARCHAR(100))  
  LANGUAGE SQLSCRIPT  
  SQL SECURITY INVOKER AS  
BEGIN  
  return select 'CURRENT_USER: ' || CURRENT_USER result from DUMMY;  
END;
```

Executing this function in hrtt/Database explorer will give the application user of the generated HDI container as result (see above for details on the different users involved in HDI).

```
1 SELECT * FROM "SW00BEPLUV5LPUCO_SYN_DUMMY_HDI_CONTAINER"."TEST_FUNC"();
2
```

The screenshot shows the SAP Studio interface. At the top, there is a code editor window with two lines of SQL. The first line is a comment, and the second line is the actual query. Below the code editor is a toolbar with icons for file operations like save, open, and export. The main area is titled 'RESULT' and contains a single row of data. The data is a single column labeled 'CURRENT\_USER' with the value 'SBSS\_28959328888102932634438105301000573974139090030705411503625669226'. There are also tabs for 'Messages' and other toolbars.

The repo for this example can be found at <https://github.com/CGilde/syn-dummy>.

## Summary

The basic concepts of synonyms in XSA and the users involved have been explained and a very simple example has been shown.

This example simplifies the creation of synonyms a little, because we did not have to consider privileges. The generated HDI users involved already have the object privileges needed to access SYS.DUMMY by default.

The only use case I can think off for creating synonyms without considering privileges is accessing system objects, for which the access privileges are automatically assigned to the generated HDI users. This could be e.g. some monitoring tools or extensions to the tooling around the Web IDE.

In the following [post](#), I will create synonyms pointing to objects I defined by myself.

# Resolve Insufficient Privilege Errors

Sunday, September 19, 2021 10:43 AM

<https://help.sap.com/viewer/6b94445c94ae495c83a19646e7c3fd56/2.0.04/en-US/d26bddb8bba54e2eac09d85c93aa8d1c.html>

call SYS.GET\_INSUFFICIENT\_PRIVILEGE\_ERROR\_DETAILS ('<GUID in "insufficient privilege" error>', ?)

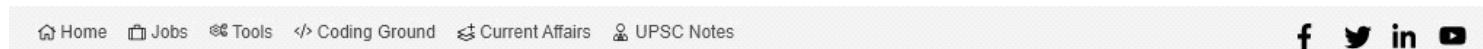
From <<https://help.sap.com/viewer/6b94445c94ae495c83a19646e7c3fd56/2.0.04/en-US/d26bddb8bba54e2eac09d85c93aa8d1c.html>>

call SYS.GET\_INSUFFICIENT\_PRIVILEGE\_ERROR\_DETAILS  
('D085D1D9FF519F40AC999317B7A9A8BC', ?)

# Granting \_SYS\_REPO with SELECT to user schema in SAP HANA

Tuesday, September 21, 2021 3:40 PM

Clipped from: <https://www.tutorialspoint.com/Granting-SYS-REPO-with-SELECT-to-user-schema-in-SAP-HANA>



## Granting \_SYS\_REPO with SELECT to user schema in SAP HANA

SAP HANA SAP Basis

In SAP HANA system \_SYS\_REPO user is required to create run time objects that are saved in HANA database under \_SYS\_BIC schema. When you activate modeling views in HANA, SYS REPO provides the read access to users on these modeling views. That is why it is required to grant \_SYS\_REPO with SELECT with GRANT privilege to user schemas.

```
GRANT SELECT ON SCHEMA "SCHEMA_NAME" TO _SYS_REPO WITH GRANT OPTION
```

This is required when you use objects of a table/view of a schema to build HANA Modeling Views. You need to grant \_SYS\_REPO the SELECT WITH GRANT privilege on this schema.



John SAP

Published on 21-Feb-2018 19:02:29



## Related Questions & Answers

- ④ Use of \_SYS\_REPO in SAP HANA database
- ④ Authoring schema vs Physical schema in SAP HANA
- ④ Using Schema mapping in SAP HANA
- ④ Setting schema mapping in SAP HANA
- ④ Checking SAP HANA Schema owner name
- ④ Taking schema wise backup in SAP HANA
- ④ Taking backup of schema in SAP HANA
- ④ Use of \_SYS\_BIC schema in SAP HANA
- ④ Use of \_SYS\_BI schema in SAP HANA
- ④ Different schema types in SAP HANA database
- ④ Checking schema creation in SAP HANA database
- ④ Checking all tables and schema in SAP HANA
- ④ Checking authoring schema job details in SAP HANA
- ④ Using Package specific default schema in SAP HANA

↳ Checking authoring schema job details in SAP HANA

↳ Using Package specific default schema in SAP HANA

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# SAP HANA Tutorial, Material and Certification Guide

Tuesday, September 21, 2021 3:42 PM

Clipped from: <http://www.hanaexam.com/p/select-privilege-to-sysrepo.html>

The screenshot shows the SAP HANA Central homepage. At the top, there's a search bar and user account links for 'Create Blog' and 'Sign In'. Below the header, a large blue banner displays the text 'SAP HANA Central'. The main navigation menu is located below the banner, featuring links for 'Home', 'SAP HANA Tutorials', 'Database Training', 'Interview - Q&A', 'Job', 'Certifications', and 'Books'. The 'SAP HANA Tutorials' link is currently highlighted.

## SELECT Privilege To \_SYS\_REPO

If objects (tables/views) of a schema (say SCHEMA\_ABC) are used to build modeling views then it's necessary to grant \_SYS\_REPO the SELECT WITH GRANT privilege on this schema.

The following SQL statement must be executed before activating any such modeling views.

### GRANT SELECT ON SCHEMA SCHEMA\_ABC TO \_SYS\_REPO WITH GRANT OPTION

If you miss this step, an error will occur when you activate your views later.  
**Explanation:**

The activation of modeling views are done in the name of user \_SYS\_REPO.

Think of \_SYS\_REPO as "the activation guy". It takes your models and creates the necessary runtime objects from them. Therefore user \_SYS\_REPO needs the allowance to select YOUR tables/views. (If \_SYS\_REPO user cannot select on the tables specified in the from-clause of the view-definition, it cannot define that view)

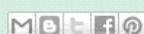
If other users need to select this view (obviously this is always the case, otherwise the views would not make sense), then \_SYS\_REPO needs to have the additional allowance to grant the select further (WITH GRANT OPTION).

Therefore after having activated all your models that access data in your schemas, \_SYS\_REPO wants to give you (and probably other users) read access to the activated models.

If NO object of the schema will be used for modeling views, then you do not need to grant select on that schema to \_SYS\_REPO.

If you replicate data automatically, using SAP LTR Server, this command is executed automatically in the background while creating a new schema.

[Click here to go to Next Chapter. 3.4. Quiz](#)



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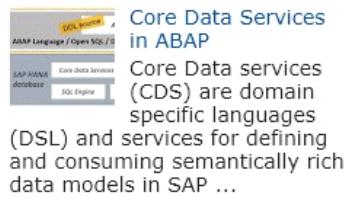
 

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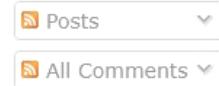
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Friday, September 24, 2021 12:48 PM

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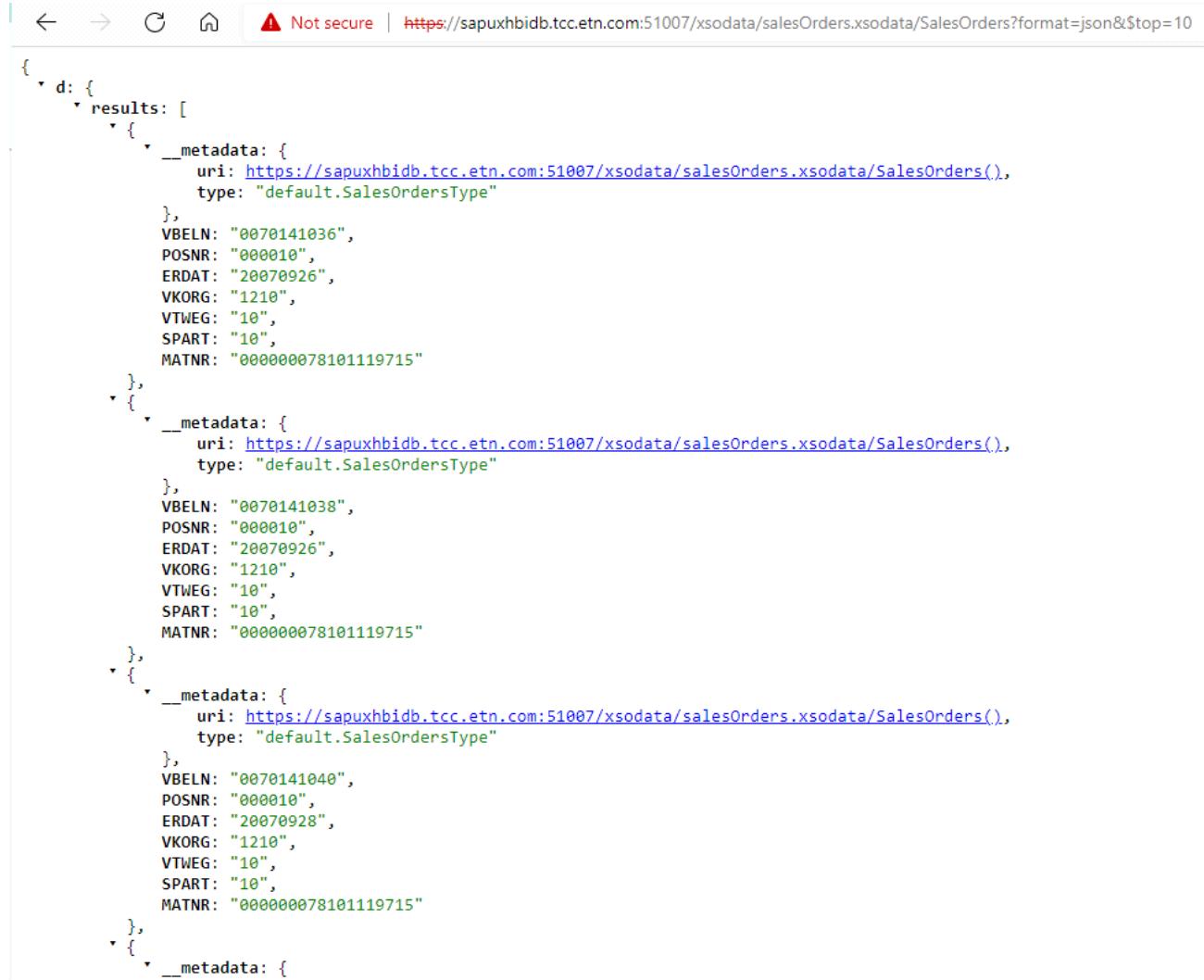


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Friday, September 24, 2021 1:58 PM

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The screenshot shows a browser window with the following details:

- Address bar: https://sapuxhbldb.tcc.etn.com:51007/xsodata/salesOrders.xsodata/SalesOrders?format=json&\$top=10
- Status bar: Not secure
- Content pane: A JSON object representing a list of sales orders. The object has a single key 'd' which contains an array of results. Each result is an object with a '\_metadata' key pointing to the same URI as the main page, a 'type' key ('default.SalesOrdersType'), and several data fields: VBELN, POSNR, ERDAT, VKORG, VTWEG, SPART, and MATNR.

```
{
  "d": {
    "results": [
      {
        "_metadata": {
          "uri": "https://sapuxhbldb.tcc.etn.com:51007/xsodata/salesOrders.xsodata/SalesOrders().",
          "type": "default.SalesOrdersType"
        },
        "VBELN": "0070141036",
        "POSNR": "000010",
        "ERDAT": "20070926",
        "VKORG": "1210",
        "VTWEG": "10",
        "SPART": "10",
        "MATNR": "00000078101119715"
      },
      {
        "_metadata": {
          "uri": "https://sapuxhbldb.tcc.etn.com:51007/xsodata/salesOrders.xsodata/SalesOrders().",
          "type": "default.SalesOrdersType"
        },
        "VBELN": "0070141038",
        "POSNR": "000010",
        "ERDAT": "20070926",
        "VKORG": "1210",
        "VTWEG": "10",
        "SPART": "10",
        "MATNR": "00000078101119715"
      },
      {
        "_metadata": {
          "uri": "https://sapuxhbldb.tcc.etn.com:51007/xsodata/salesOrders.xsodata/SalesOrders().",
          "type": "default.SalesOrdersType"
        },
        "VBELN": "0070141040",
        "POSNR": "000010",
        "ERDAT": "20070928",
        "VKORG": "1210",
        "VTWEG": "10",
        "SPART": "10",
        "MATNR": "00000078101119715"
      },
      {
        "_metadata": {
          "uri": "https://sapuxhbldb.tcc.etn.com:51007/xsodata/salesOrders.xsodata/SalesOrders().",
          "type": "default.SalesOrdersType"
        }
      }
    ]
  }
}
```

# Creating an OData Service with an Entity Relationship | Tutorials for SAP Developers

Tuesday, January 18, 2022 4:29 PM

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Webpage

# Setup FREE HANA DB in cloud

Friday, April 9, 2021 8:11 AM

## Setup FREE HANA DB in cloud | Setup of SAP HANA Database in SAP Hana Cloud Platform

From <<https://www.youtube.com/watch?v=G5tNI8m98II>>

[Setup FREE HANA DB in cloud | Setup of SAP HANA Database in SAP Hana Cloud Platform](#)  
Anubhav Oberoy



## XSA links

Thursday, April 8, 2021 5:00 PM

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|                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="https://help.sap.com/viewer/4505d0bdaf4948449b7f7379d24d0f0d/2.0.05/en-US/83d45af13d8240bd85d0a9eedd685445.html">https://help.sap.com/viewer/4505d0bdaf4948449b7f7379d24d0f0d/2.0.05/en-US/83d45af13d8240bd85d0a9eedd685445.html</a> | Defining OData v4 Services for XS Advanced Java Applications<br><br>From < <a href="https://help.sap.com/viewer/4505d0bdaf4948449b7f7379d24d0f0d/2.0.05/en-US/83d45af13d8240bd85d0a9eedd685445.html">https://help.sap.com/viewer/4505d0bdaf4948449b7f7379d24d0f0d/2.0.05/en-US/83d45af13d8240bd85d0a9eedd685445.html</a> > |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## SAP HANA 2.0 XS Advanced Installation – by the SAP HANA Academy

From <<https://sapbazar.com/articles/item/590-sap-hana-20-xs-advanced-installation-by-the-sap-hana-academy>>

### Tutorial: Create OData v4 Services for XS Advanced Java Applications

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### Defining OData v2 Services for XS Advanced JavaScript Applications

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## Create a Cloud Foundry or XS Advanced App that Queries SAP HANA

From <<https://developers.sap.com/tutorials/hana-clients-cf.html>>

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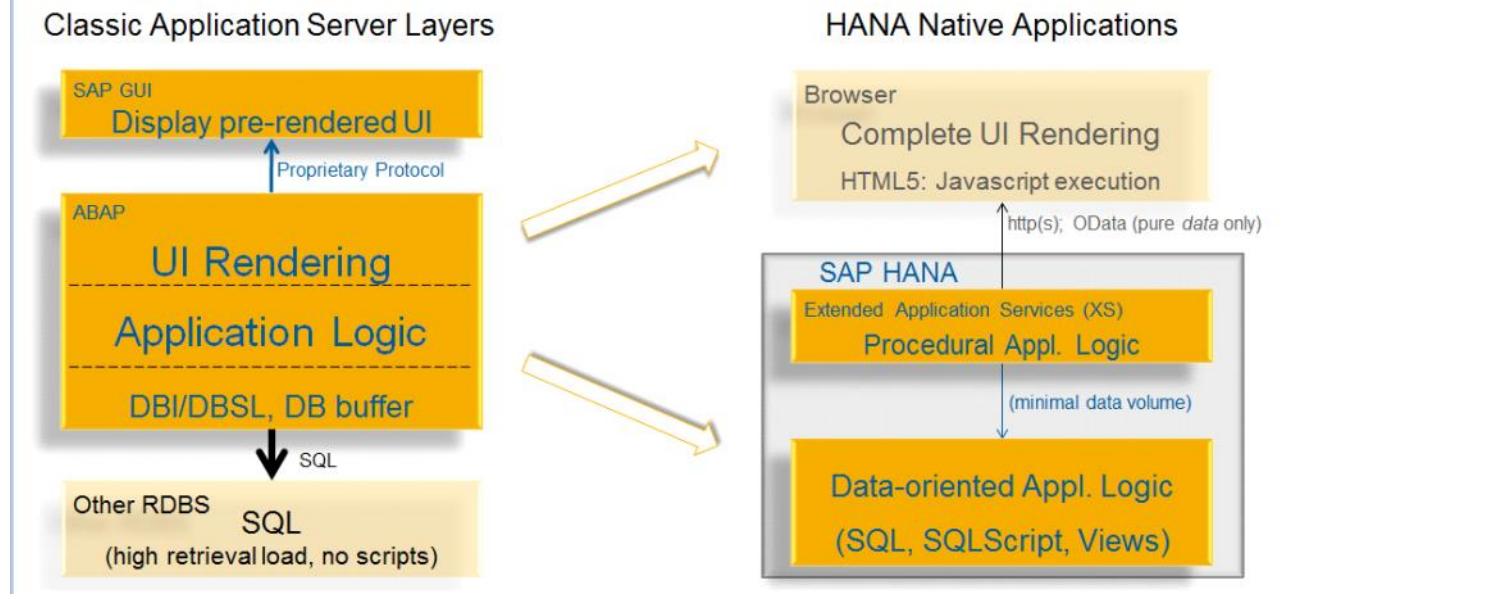
From <<https://blogs.sap.com/2020/11/04/create-your-trial-sap-hana-cloud-instance-in-sap-cloud-foundry/>>  
Set Up the SAP Cloud Platform, SAP HANA Service

From <<https://developers.sap.com/group.hana-service-setup.html>>

[https://help.sap.com/doc/13ff61e61a8f442090e27050dc61f019/2.0.03/en-US/SAP\\_HANA\\_Interactive\\_Education\\_SHINE\\_for\\_SAP\\_HANA\\_XS\\_Advanced\\_en\\_HANA2SPS03.pdf](https://help.sap.com/doc/13ff61e61a8f442090e27050dc61f019/2.0.03/en-US/SAP_HANA_Interactive_Education_SHINE_for_SAP_HANA_XS_Advanced_en_HANA2SPS03.pdf)

SAP HANA Interactive Education (SHINE) for SAP HANA 2.0 SPS03 for SAP HANA XS Advanced Model

## Programming model – paradigm shift: responsibilities in runtime layers



## ABAP and HANA Native Development (on-premise)

### ABAP

- applications follow 3-tier architecture
- ABAP is in general database agnostic, but with release 7.4 optimized for SAP HANA
- Programming language: ABAP / ABAP OO with the option to use SAP HANA features
- IDE: eclipse-based ABAP Development Tools

### HANA Native Development

- applications follow 2-tier architecture
- HANA Native Development is SAP HANA specific and embedded in the database
- Programming language: River; server-side JavaScript, SQL/SQLScript
- IDE: eclipse-based SAP HANA Studio + web IDE

### Guidance

- use ABAP for optimization of existing programs (in context of SAP Business Suite or BW)
- consider HANA Native Development for development of new applications which will solely run on SAP HANA
- combine ABAP and HANA Native Development to enrich existing applications (e.g. SAP HANA Live, Fiori)



sap hana xs  
native de...

## ABAP and HANA Native Development (on-premise)

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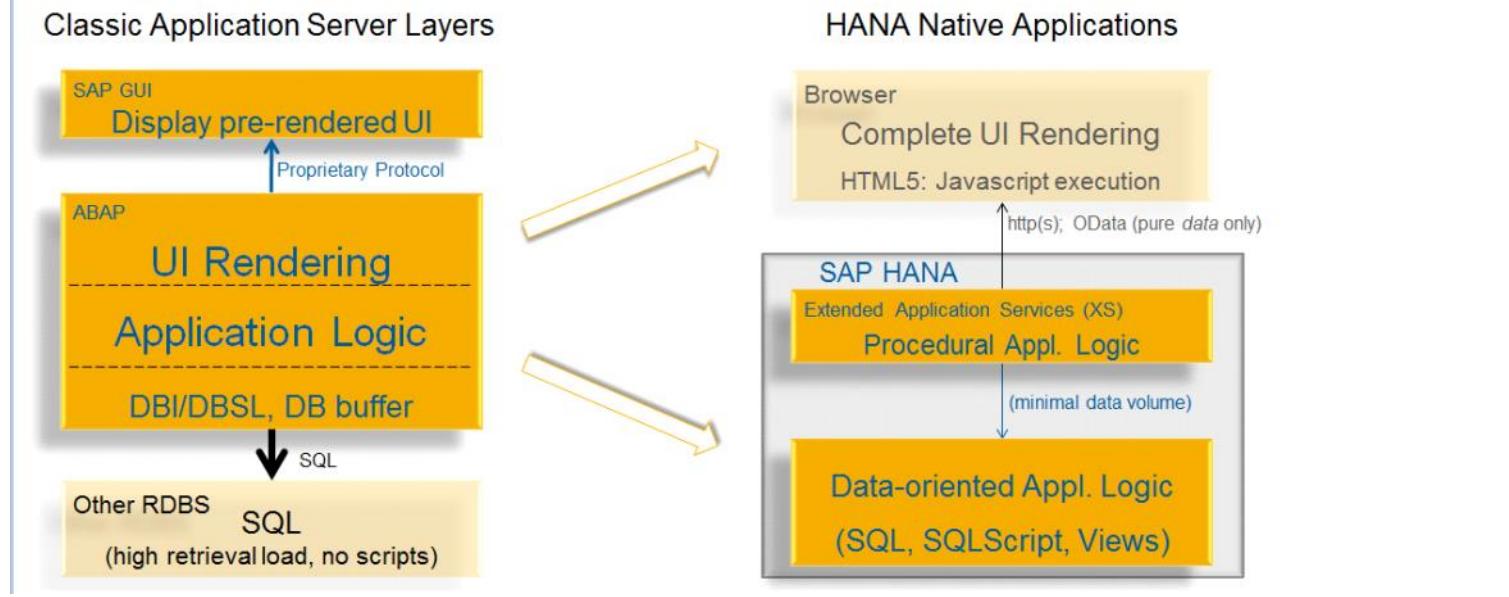
# Sap hana native application development

Wednesday, March 15, 2017 2:13 PM



sap hana xs  
native de...

## Programming model – paradigm shift: responsibilities in runtime layers



## ABAP and HANA Native Development (on-premise)

### ABAP

- applications follow 3-tier architecture
- ABAP is in general database agnostic, but with release 7.4 optimized for SAP HANA
- Programming language: ABAP / ABAP OO with the option to use SAP HANA features
- IDE: eclipse-based ABAP Development Tools

### HANA Native Development

- applications follow 2-tier architecture
- HANA Native Development is SAP HANA specific and embedded in the database
- Programming language: River; server-side JavaScript, SQL/SQLScript
- IDE: eclipse-based SAP HANA Studio + web IDE

### Guidance

- use ABAP for optimization of existing programs (in context of SAP Business Suite or BW)
- consider HANA Native Development for development of new applications which will solely run on SAP HANA
- combine ABAP and HANA Native Development to enrich existing applications (e.g. SAP HANA Live, Fiori)



sap hana xs  
native de...

## ABAP and HANA Native Development (on-premise)

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# Nodejs commands

Saturday, April 10, 2021 4:19 PM

|                  |                                                  |
|------------------|--------------------------------------------------|
| npm install      | Using package.json installs all required modules |
| npm init         | To intialize and create package.json             |
| node <module>.js | To run                                           |
| Nodemon <>.js    |                                                  |

# ADSO - DATA replication transaction

Friday, July 8, 2022 4:11 PM

Transaction : RSPC

[ADSO - DATA Replication-](#)



ADSO -  
DATA Rep...  
1



ADSO -  
DATA Rep...

# How to Find if table is in HANA or not

Wednesday, October 4, 2023 4:51 PM



How to Find  
if table is ...

# HBI XSA

Friday, April 23, 2021 1:28 PM

<https://sapuxhbldb.tcc.etn.com:51040>

<https://sapuxhbldb.tcc.etn.com:53077>

|                    |                            |
|--------------------|----------------------------|
| User id : E9811861 | Password :- Venkatjulu@0@1 |
|--------------------|----------------------------|

ONLY in HBI (XSA and DB passwords are different) :-

XSA layer password : Unity123456!  
DB layer password :- Haripass4HBI\$

|                                                                                                                                     |                 | password       |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|
| <a href="https://sapuxhbldb.tcc.etn.com:53077/watt/index.html">https://sapuxhbldb.tcc.etn.com:53077/watt/index.html</a>             | WEBIDE HBI      | Unity123456!   |
| <a href="https://sapuxhbldb.tcc.etn.com:51040/cockpit#/xsa/overview">https://sapuxhbldb.tcc.etn.com:51040/cockpit#/xsa/overview</a> | HBI XSA cockpit |                |
| DB layer password                                                                                                                   |                 | Haripass4HBI\$ |

|                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <a href="https://sapuxhbldb.tcc.etn.com:51007/xsodata/salesOrders.xsodata/SalesOrders?\$top=10&amp;\$skip=100&amp;\$format=json&amp;\$filter=MATNR%20eq%20%27000000078101119705%27and%20ERDAT%20gt%20%2720200101%27">https://sapuxhbldb.tcc.etn.com:51007/xsodata/salesOrders.xsodata/SalesOrders?\$top=10&amp;\$skip=100&amp;\$format=json&amp;\$filter=MATNR%20eq%20%27000000078101119705%27and%20ERDAT%20gt%20%2720200101%27</a> | TEST URL |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|

# HDB XSA

Friday, April 23, 2021 12:36 PM

ORG:Eaton SPACE : DEV

<https://sapuxhbd.tcc.etn.com:51040> - DEV XSA

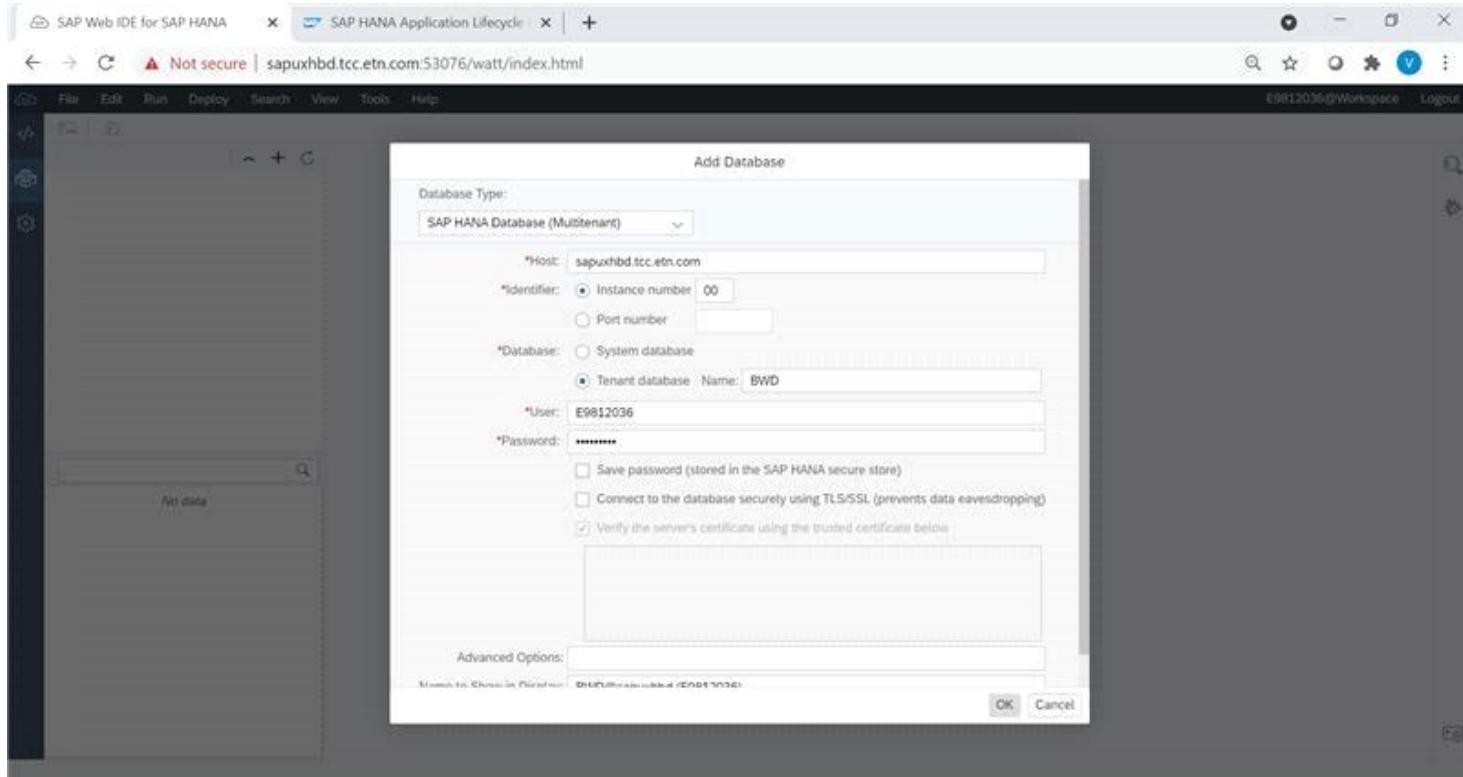
<https://sapuxhbd.tcc.etn.com:53076> - DEV WEBIDE

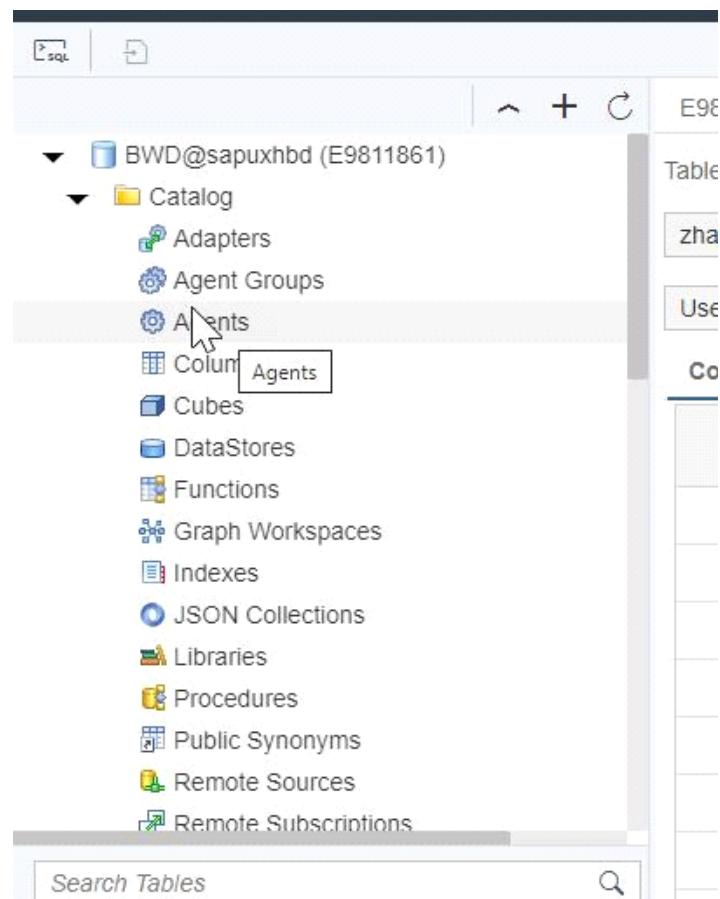
Username : E9811861 and password : Development\_123

NEW Password :- Harivn!981 - HB1 and HB2 /HBD

Venkatjan@0@1

To connect to HDB database





# Passwords

Friday, December 3, 2021 9:20 AM

|               |                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------|
| Venkatdec@0@1 | <a href="https://sapuxhbd.tcc.etn.com:51040">https://sapuxhbd.tcc.etn.com:51040</a> - DEV XSA |
|---------------|-----------------------------------------------------------------------------------------------|

# XSA server links

Thursday, March 24, 2022 3:05 PM

HBD :

|             |         |     |                    |                                                                                     |
|-------------|---------|-----|--------------------|-------------------------------------------------------------------------------------|
| webide      | STARTED | 1/1 | 512 MB <unlimited> | <a href="https://sapuxhbd.tcc.etn.com:53076">https://sapuxhbd.tcc.etn.com:53076</a> |
| xsa-cockpit | STARTED | 1/1 | 512 MB <unlimited> | <a href="https://sapuxhbd.tcc.etn.com:51040">https://sapuxhbd.tcc.etn.com:51040</a> |

HB1:

|             |         |     |                      |                                                                                                             |
|-------------|---------|-----|----------------------|-------------------------------------------------------------------------------------------------------------|
| webide      | STARTED | 1/1 | - 512 MB <unlimited> | <a href="https://webide.sapuxhb1.tcc.etn.com:30533">https://webide.sapuxhb1.tcc.etn.com:30533</a>           |
| xsa-cockpit | STARTED | 1/1 | - 512 MB <unlimited> | <a href="https://xsa-cockpit.sapuxhb1.tcc.etn.com:30533">https://xsa-cockpit.sapuxhb1.tcc.etn.com:30533</a> |

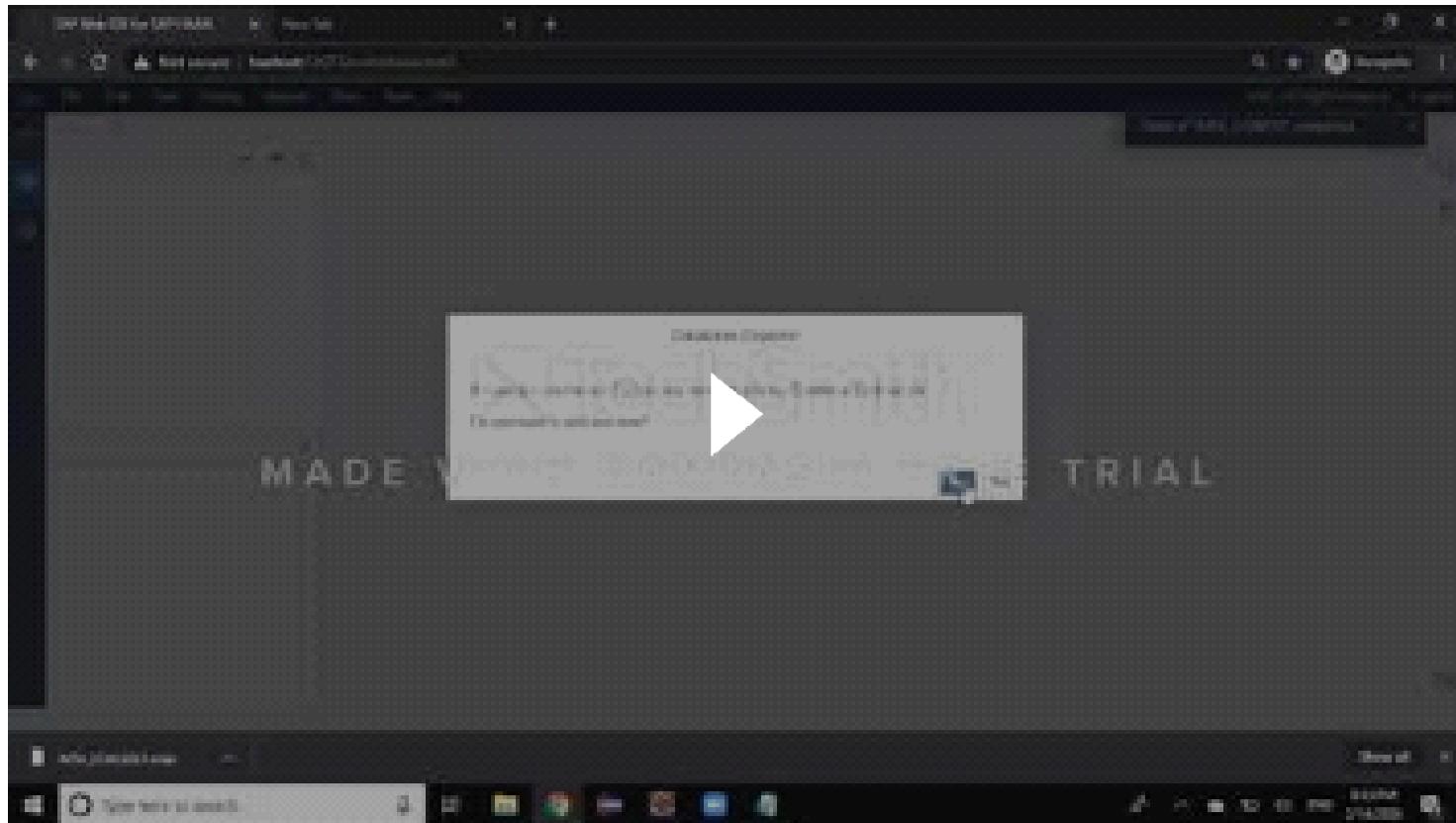
HB2:

|             |         |     |                      |                                                                                                             |
|-------------|---------|-----|----------------------|-------------------------------------------------------------------------------------------------------------|
| webide      | STARTED | 1/1 | - 512 MB <unlimited> | <a href="https://webide.sapuxhb2.tcc.etn.com:31033">https://webide.sapuxhb2.tcc.etn.com:31033</a>           |
| xsa-cockpit | STARTED | 1/1 | - 512 MB <unlimited> | <a href="https://xsa-cockpit.sapuxhb2.tcc.etn.com:31033">https://xsa-cockpit.sapuxhb2.tcc.etn.com:31033</a> |

# HANA Transports

Tuesday, March 29, 2022 7:30 PM

[SAP HANA XSA Web IDE Private build Vs deployment](#)



## How to check logs in XSA cockpit- QA - HB2

Thursday, March 31, 2022 6:37 AM

The screenshot shows the SAP HANA XS Advanced Cockpit interface. The left sidebar has a green 'Logs' button selected. The main area displays a log viewer titled 'Application: DB - Logs'. A search bar at the top right shows the filter 'error'. The log entries are listed below, with the last few entries highlighted in a red box:

```
(922337203685477543)[1648665880656] [APP/2/2/deploy] OUT Warning: com.sap.hana.di.synonym: Database error 591: : connection is poisoned due to transaction errors; statement was rejected (1311) [8201003]
(922337203685477543)[1648665880656] [APP/2/2/deploy] OUT Warning: Worker 1 running the "com.sap.hana.di.synonym" plugin has encountered an error while deploying 1 objects [8212030]
(922337203685477543)[1648665880656] [APP/2/2/deploy] OUT Warning: Worker 24 running the "com.sap.hana.di.synonym" plugin has encountered an error while deploying 1 objects [8212030]
(922337203685477543)[1648665880656] [APP/2/2/deploy] OUT Warning: Worker 9 running the "com.sap.hana.di.synonym" plugin has encountered an error while deploying 1 objects [8212030]
(922337203685477543)[1648665880656] [APP/2/2/deploy] OUT Warning: Worker 2 running the "com.sap.hana.di.synonym" plugin has encountered an error while deploying 1 objects [8212030]
(922337203685477543)[1648665880656] [APP/2/2/deploy] OUT Warning: Worker 23 running the "com.sap.hana.di.synonym" plugin has encountered an error while deploying 1 objects [8212030]
(9223372036854775440)[1648665880656] [APP/2/2/deploy] OUT Warning: Worker 23 running the "com.sap.hana.di.synonym" plugin has encountered an error while deploying 1 objects [8212030]
(9223372036854775441)[1648665880656] [APP/2/2/deploy] OUT Error: com.sap.hana.di.synonym: The "SAPBAPI/BICAZMM_AD232" synonym target does not exist [8250501]
(9223372036854775441)[1648665880656] [APP/2/2/deploy] OUT Error: Worker 1 has encountered an error; all remaining jobs will be canceled [8214600]
(9223372036854775444)[1648665880656] [APP/2/2/deploy] OUT Error: Worker 24 has encountered an error; all remaining jobs will be canceled [8214600]
(9223372036854775444)[1648665880656] [APP/2/2/deploy] OUT Error: Worker 9 has encountered an error; all remaining jobs will be canceled [8214600]
(9223372036854775446)[1648665880656] [APP/2/2/deploy] OUT Warning: Worker 26 running the "com.sap.hana.di.synonym" plugin has encountered an error while deploying 1 objects [8212030]
(9223372036854775447)[1648665880656] [APP/2/2/deploy] OUT Error: Worker 12 stopped due to an unexpected error [8214501]
(9223372036854775448)[1648665880656] [APP/2/2/deploy] OUT Error: Database error 591: : connection is poisoned due to transaction errors; statement was rejected (1311) [8201003]
(9223372036854775451)[1648665880656] [APP/2/2/deploy] OUT Warning: com.sap.hana.di.synonym.config: Database error 591: : connection is poisoned due to transaction errors; statement was rejected (1311) [8201003]
(9223372036854775453)[1648665880656] [APP/2/2/deploy] OUT Error: Worker 23 has encountered an error; all remaining jobs will be canceled [8214600]
```

# SAP Response

Sunday, August 28, 2022 9:06 AM

Hello,

I did some more research on that

how to grant access to the HDI generated containers to limit selection authorization

I read through these documentations that I think will help you:

<https://www.sap.com/documents/2018/04/fe086f0d-fa7c-0010-87a3-c30de2ffd8ff.html>

From chapter 4 on HDI and especially

4.4 Breaking the container isolation

See also carefully - How to share tables across different CAP projects

<https://blogs.sap.com/2021/10/03/how-to-share-tables-across-different-cap-projects/>

The Default Access Role for HDI Containers

[https://help.sap.com/docs/SAP\\_HANA\\_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/9235c9dd8dbf410f915ffe305296a032.html?version=2.0.04](https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/9235c9dd8dbf410f915ffe305296a032.html?version=2.0.04)

Enable Access to Objects in Another HDI Container

[https://help.sap.com/docs/SAP\\_HANA\\_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/4adba34bd86544a880db8f9f1e32efb7.html?version=2.0.03&locale=en-us](https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/4adba34bd86544a880db8f9f1e32efb7.html?version=2.0.03&locale=en-us)

Grant Access to an SAP HDI Container's Schema

[https://help.sap.com/docs/SAP\\_HANA\\_PLATFORM/3823b0f33420468ba5f1cf7f59bd6bd9/14ccad20b2b64190b269a488e0f44cbc.html?version=2.0.04](https://help.sap.com/docs/SAP_HANA_PLATFORM/3823b0f33420468ba5f1cf7f59bd6bd9/14ccad20b2b64190b269a488e0f44cbc.html?version=2.0.04)

Regards

Kingsley

# Missing specification of keys for view

Friday, September 2, 2022 6:53 AM

<https://launchpad.support.sap.com/#/notes/2472427>

[Facing errors while creating a odata service consuming a calculation view. | SAP Community](#)

# 2472427 - Missing specification of keys for view - HANA DB - SAP ONE Support Launchpad

Friday, September 2, 2022 6:54 AM

Clipped from: <https://launchpad.support.sap.com/#/notes/2472427>

The screenshot shows a SAP Knowledge Base Article page. At the top, there are several icons followed by the SAP logo and the text "SAP Knowledge Base Article". To the right of the SAP logo are buttons for "Knowledge..." and "2472427". Further to the right are user-related icons and the name "Narahari Vedula (S0009837495)". Below this header, the title "2472427 - Missing specification of keys for view - HANA DB" is displayed, along with a note indicating "Version 2 from 27.01.2022 in English". On the far right, there are several small square icons and a "Show Changes" button. Below the title, there is a navigation bar with four tabs: "Description" (which is underlined), "Product", "Languages", and "Rate This Document".

## Symptom

When adding a calculation view as a service to the .xsodata file, activating the .xsodata file fails and the following error is logged in the job log:  
'Missing specification of keys for view "repository\_name/cv\_name"!'

## Environment

- HANA DB
- XS Engine

## Reproducing the Issue

1. Create a calculation view
2. Add scenarios (Aggregation, Projection, Union, Join)
3. Click *Semantics*
4. Choose a key by checking the checkbox under *Key* for the property
5. Save the calculation view
6. Right click the calculation view and click *Activate*
7. Open the .xsodata file
8. Add one of the following to the service section:
  - "repository/cv\_name.calculationview" as "Entity";
  - "repository/cv\_name.calculationview" as "Entity" keys "repository/cv\_name.calculationview.ID";
9. Save the .xsodata file
10. Right click the .xsodata file and click *Activate*
11. The error message in the Symptom section above is logged

## Cause

### Hdbgrants file

```
{  
  "ServiceName_1": {  
    "object_owner": {  
      "object_privileges": [  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD182",  
          "privileges": ["SELECT"]  
        },  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD192",  
          "privileges": ["SELECT"]  
        },  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD222",  
          "privileges": ["SELECT"]  
        },  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD202",  
          "privileges": ["SELECT"]  
        },  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD232",  
          "privileges": ["SELECT"]  
        },  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD242",  
          "privileges": ["SELECT"]  
        },  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD262",  
          "privileges": ["SELECT"]  
        }  
      ]  
    },  
    "application_user": {  
      "object_privileges": [  
        {  
          "schema": "SAPABAP1",  
          "name": "/BIC/AZMM_AD182",  
          "privileges": ["SELECT"]  
        }  
      ]  
    }  
  }  
}
```

```
        "privileges":["SELECT"]
    },
    {
        "schema":"SAPABAP1",
        "name": "/BIC/AZMM_AD192",
        "privileges":["SELECT"]
    },
    {
        "schema":"SAPABAP1",
        "name": "/BIC/AZMM_AD222",
        "privileges":["SELECT"]
    },
    {
        "schema":"SAPABAP1",
        "name": "/BIC/AZMM_AD202",
        "privileges":["SELECT"]
    },
    {
        "schema":"SAPABAP1",
        "name": "/BIC/AZMM_AD232",
        "privileges":["SELECT"]
    },
    {
        "schema":"SAPABAP1",
        "name": "/BIC/AZMM_AD242",
        "privileges":["SELECT"]
    },
    {
        "schema":"SAPABAP1",
        "name": "/BIC/AZMM_AD262",
        "privileges":["SELECT"]
    }
}
]
```

# XSA OVERVIEW and TrippLite KT

Monday, September 12, 2022 10:01 PM

[TS\\_SupplierPortal\\_HANA](#)

[SAP HANA XSA development guidelines](#)

[APIGEE - TrippLite SupplierPortal HANA Proxy](#)

# Transport CTS+

Friday, September 16, 2022 8:43 PM

## Change and Transport System (CTS) Transport

When CTS transport is enabled in one system, any transport route with this system defined as source system or target system is no longer available for native SAP HANA transport. We recommend that you switch the entire SAP HANA transport landscape either to CTS export or to native SAP HANA transport, but not to use both modes in one landscape.

CTS upload by default has 100MB size limit for single file. If you need to export a single archive that exceeds 100 MB, you need to change the `icm/HTTP/max_request_size_KB` setting in the ABAP server that hosts the Export Web Service.

### Command line tool (hdbalm)

- To make sure that the dependency check works properly for installations and updates, your SAP HANA systems must be installed using hdblcm and not with hdbinst. Otherwise, one of the following error messages may occur during the installation of an SAP HANA add-on (SAP HANA content) using hdbalm:
  - 'Delivery unit <XY> has missing dependencies. Install the required delivery units from content provider.' 'See dependencies error information in the log.'
  - 'The product <X> [instance <Y>], has missing dependencies. Check product installation prerequisites' 'See dependencies error information in the log.'For more information, see SAP Note [2212387](#).
- The command line tool hdbalm does not support the use case where Maintenance Optimizer (MOPZ) generates a stack.xml and downloads all software component versions (SCVs) necessary for installation in one directory. hdbalm cannot install all SCVs of this directory at once.  
As a workaround, you can use hdbalm to install all SCVs that are relevant for the system with one hdbalm call: `hdablm install scv1.zip scv2.zip ....` You can use the stack.xml to find out which SCVs are relevant for the system. The SCVs that contain the entry `<runtime-type>HDB</runtime-type>` can be installed using hdbalm. Afterwards, you have to use the hdbalm register command to register the product information: `Hdbalm register <stack.xml>`. However, there is the following restriction: Stack.xml files that describe more than one support package stack are not supported.
- The warning message "From product version comparison, you have already installed the same product version" displayed during installation of products with caption "SAP HANA PLATFORM EDIT. 1.0" can be ignored.
- The following error may occur when you use hdbalm with Python version 2.7.9:  
`CertificateError: hostname '<hostname>' doesn't match either of '<hostname>', '<hostname>'`The reason is that there is a bug in Python version 2.7.9. We recommend not to use Python version 2.7.9 with SSL.
- The command line client does not support the transport based on transport routes of type *Selected Changelists*. hdbalm always transports all active objects of a DU that are part of released changelists, because hdbalm cannot ask for a selection of changelists to be transported.

From <<http://sapkbs.blogspot.com/2016/02/2233470-release-notes-for-sap-hana.html>>

Where to change :-

<https://answers.sap.com/questions/952539/icmhttpmaxrequestsizemb.html>

TA SMICM, GoTo / Parameters



[Udo Martens](#)

Jul 08, 2005 at 07:06 AM

Hi Sunita,

[TA SMICM, GoTo / Parameters](#)

Regards,

Udo

From <<https://answers.sap.com/questions/952539/icmhttpmaxrequestsizekb.html>>

From <<https://answers.sap.com/questions/952539/icmhttpmaxrequestsizekb.html>>

Tuesday, October 4, 2022 8:33 PM

[https://help.sap.com/doc/79ca8e0d124746d482b77e832205a437/Cloud/en-US/CICD\\_Best\\_Practices.pdf](https://help.sap.com/doc/79ca8e0d124746d482b77e832205a437/Cloud/en-US/CICD_Best_Practices.pdf)

# CICD\_Best\_Practices.pdf

Tuesday, October 4, 2022 8:34 PM

Clipped from:

[https://help.sap.com/doc/79ca8e0d124746d482b77e832205a437/Cloud/en-US/CICD\\_Best\\_Practices.pdf](https://help.sap.com/doc/79ca8e0d124746d482b77e832205a437/Cloud/en-US/CICD_Best_Practices.pdf)



INTERNAL  
2022-01-24

## Continuous Integration and Delivery Best Practices Guide

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THE BEST RUN **SAP**

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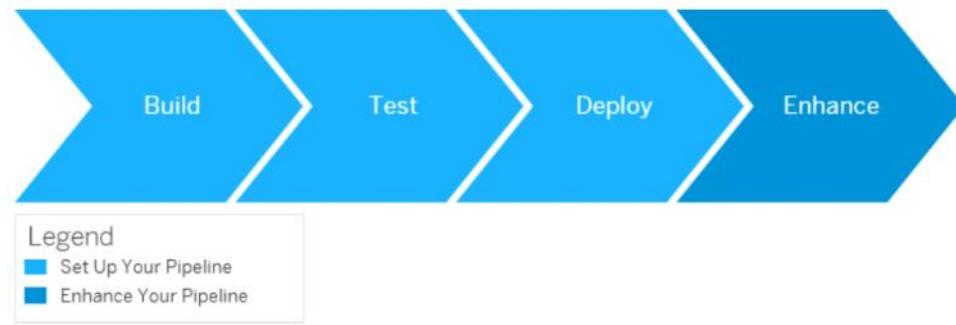
# 1 Continuous Integration and Delivery Best Practices Guide

Implement continuous integration for SAP-specific development projects.

## What Is This Guide About?

The Continuous Integration and Delivery Best Practices Guide provides simple procedures to implement continuous delivery (CD) pipelines on any CI/CD stack. It does not describe fully fledged pipelines, but rather demonstrates how to apply the principles of CI/CD to SAP-specific technologies. For more information about the concepts and principles of CI/CD, have a look at the [Continuous Integration and Delivery Introduction Guide](#).

In this guide, each procedure describes one specific SAP scenario and either focuses on the core stages of a pipeline (build, test, and deploy) or helps you enhance your existing pipeline with SAP BTP services. See [Procedures for CI/CD Pipelines \[page 5\]](#).



As they are supported by most CI tools, the Continuous Integration and Delivery Best Practices Guide proposes implementations using Bash.

## Is This Guide for You?

The Continuous Integration and Delivery Best Practices Guide addresses **customers who want to use their existing CI infrastructure** (except for Jenkins, see the following tip) and **experts in CI/CD who want to have full flexibility when implementing their pipelines**.

### → Tip

If you use Jenkins or plan to use it, consider working with project "Piper" ➔ , instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

## What You Should Consider Before Getting Started

To keep the setup of your CI environment and the installation of tools used in your pipelines as simple as possible, in our procedures, we use Docker<sup>®</sup> containers whenever applicable. However, in our scripting examples, we also provide alternatives without using Docker.

For more information on using Docker and its advantages, see [SAP Solutions for Continuous Integration and Delivery](#).

### ⚠ Caution

Please check with your IT and security departments how to handle Docker images from public sources.

## 2 Procedures for CI/CD Pipelines

Depending on your scenario, choose one of the listed procedures.

→ Tip

If you use Jenkins or plan to use it, have a look at [project "Piper"](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Set Up Your Pipeline

- [Apply CI/CD to SAP Fiori Development on SAP BTP \[page 6\]](#)  
Implement a CI/CD pipeline for the development of SAPUI5/SAP Fiori applications on SAP BTP in the Neo environment.
- [Apply CI/CD to SAP Fiori Development on an SAP Fiori Front-End Server \[page 11\]](#)  
Implement a CI/CD pipeline for the development of SAPUI5/SAP Fiori applications on an SAP Fiori front-end server .
- [Apply CI/CD to SAP HANA Extended Application Services, Advanced Model Development \[page 25\]](#)  
Implement a CI/CD pipeline for the development of SAP HANA extended application services, advanced model applications.

### Enhance Your Pipeline

- [Integrate SAP Cloud Transport Management into Your CI/CD Pipeline \[page 30\]](#)  
Add an enterprise-ready change and release management process to your CI/CD pipeline and enable the transport of cloud-based applications on SAP BTP.
- [Integrate Change Control Management with SAP Solution Manager into Your CI/CD Pipeline \[page 35\]](#)  
Add change control management processes to your CI/CD pipeline and facilitate the synchronization of changes made both on-premise and on SAP BTP.

## 2.1 Apply CI/CD to SAP Fiori Development on SAP BTP

Implement a CI/CD pipeline for the development of SAPUI5/SAP Fiori applications on SAP BTP in the Neo environment.

### → Tip

If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Build and Deploy SAPUI5/SAP Fiori Applications on SAP BTP](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Context

This procedure explains how to wrap your SAPUI5/SAP Fiori application into a multitarget application (MTA) to produce an archive that is deployable on SAP BTP. As of today, many CI tools provide Bash scripting support and you can implement the corresponding Bash commands in a CI tool of your choice.

A multitarget application (MTA) is a package that comprises multiple application and resource modules, which share a common lifecycle even though they might have been created with different technologies and deployed to different runtimes. To create a MTA, you bundle the modules, describe them along with their interdependencies to other modules, services, and interfaces, and package them. MTAs can be deployed to SAP HANA Extended Application Services, Advanced Model, Cloud Foundry, and Neo environments. In this procedure, you deploy the resulting .mtar file to the SAP BTP Neo environment. For more information, see [The Multitarget Application Model](#).

### Prerequisites

- As it prevents clutter on your build system and improves both maintainability and flexibility, we recommend working with [Docker](#). Refer to the documentation of your CI tool to check whether it supports the usage of Docker containers in its pipelines.

### ⚠ Caution

Please check with your IT and security departments how to handle Docker images from public sources.

- You have an SAPUI5/SAP Fiori application as source in a source code management system of your choice. To build it, you can choose between two different tooling options:
  - [UI5 Tooling](#)
  - Grunt

### ℹ Note

If you generate your project in SAP Web IDE, depending on its version, the builder is preconfigured to either Grunt or UI5 tooling.

Depending on your tooling, expand one of the following sections and make sure that you meet the described prerequisites:

### Additional Prerequisites When Using the UI5 Tooling

On the top level of your directory, you have:

- An mta.yaml which contains the following script:

#### ↳ Sample Code

```
ID: openui5-sample-app
version: 1.0.0
_schema-version: '2.1'
modules:
  - name: webapp
    type: html5
    path: .
    parameters:
      disk-quota: 256M
      memory: 256M
    build-parameters:
      builder: npm
```

- A package.json file which contains the following build script:

```
"scripts": {
  "build": "ui5 build --a",
  "test": "uiveri5"
  "linting": "eslint ."
}
```

#### i Note

The build script executes the UI5 command-line tool. In this example, the test script runs UIVeri5. You can, however, substitute uiveri5 with any other automated tests you have implemented.

### Additional Prerequisites When Using Grunt

On the top level of your directory, you have:

- An mta.yaml file which contains the following script:

#### ↳ Sample Code

```
ID: openui5-sample-app
version: 1.0.0
_schema-version: '2.1'
modules:
  - name: webapp
    type: html5
    path: .
    parameters:
      disk-quota: 256M
      memory: 256M
    build-parameters:
      builder: npm
```

- A package.json file which contains the following build script:

```
"scripts": {
```

```
        "build": "ui5 build --a",
        "test": "uiveri5"
        "linting": "eslint ."
    }
```

#### i Note

The build script executes the UI5 command-line tool. In this example, the test script runs UIVeri5. You can, however, substitute uiveri5 with any other automated tests you have implemented.

- A local `.npmrc` file that contains the following entry to download the `@sap/grunt-sapui5-bestpractice-build`:

```
registry=https://registry.npmjs.org/
@sap:registry=https://npm.sap.com/
```

#### i Note

If you use our recommended Docker image, this reference already exists.

- A Grunt file which contains the following:

```
module.exports = function (grunt) {
    "use strict";
    grunt.loadNpmTasks("@sap/grunt-sapui5-bestpractice-build");
    grunt.config.merge({ compatVersion: "1.38" });
    grunt.registerTask("default", [
        "clean",
        "lint",
        "build"
    ]);
    grunt.loadNpmTasks("@sap/grunt-sapui5-bestpractice-test");
    grunt.registerTask("unit_and_integration_tests", ["test"]);
    grunt.config.merge({
        coverage_threshold: {
            statements: 0,
            branches: 100,
            functions: 0,
            lines: 0
        }
    });
};
```

For more information on how to set up your Grunt build in SAP Web IDE Full-Stack, see [Grunt Build in SAP Web IDE Full-Stack](#).

## Procedure

In this procedure, we focus on the core stages of a pipeline: build, test, and deploy.

#### → Tip

You can combine and enhance these simple build, test, and deploy steps to implement more complex pipelines.

### 1. Build



The build optimizes and packages your project sources. Use the Cloud MTA Build Tool to orchestrate the technical build steps using Node Package Manager (npm), which are defined in the package.json. See [Cloud MTA Build Tool](#). Depending on your configuration, you can also add linting and unit tests. The build produces an out.mtar file, which is used in the following deployment stage. See step 3: **Deploy**. For more information on how to download, set up, and run the Cloud MTA Build Tool, see [Setting Up and Using the Multitarget Application Archive Builder](#).

To run the build, choose one of the following options:

- **With Docker:**

Execute the following command in the directory that contains your project sources:

```
docker run -v "${PWD}":/project devxci/mbtci:latest mbt --mtar out.mtar --platform CF build
```

**i Note**

As many CI tools automatically mount your workspace that contains the project sources into your Docker container, you may omit the `-v` command, which mounts your current working directory.

**→ Tip**

If you change the build target to `CF` or `XSA`, you can reuse this call for other scenarios.

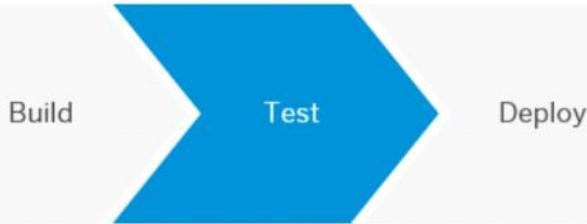
- **Without Docker:**

If you provide all dependencies on the build server, you can build your project without Docker by placing the multitarget application archive builder directly on your build system. See <https://tools.hana.ondemand.com/#cloud>.

Execute the following command in the directory that contains your project sources:

```
java -jar /path/to/mta.jar --mtar out.mtar --build-target NEO build
```

2. **Test**



Depending on your requirements and the setup of your project, consider adding automated tests to it. In your package.json, you have already configured them with the following lines:

```
"test": "uiveri5"
```

```
"linting": "eslint ."
```

For SAPUI5/ SAP Fiori, we recommend implementing UIVeri5 and OPA5 tests. See, for example [Add Automated System Tests with the SAPUI5 Test Recorder to Your CI/CD Pipeline](#) and [Testing](#).

To add automated tests, choose one of the following options:

- **With Docker:**

From the Docker community, use a standard image using Node.js in a version that fits your requirements and execute the following commands:

```
docker run -v "${PWD}":/project node:latest npm run-script test
```

```
docker run -v "${PWD}":/project node:latest npm run-script linting
```

**i Note**

As many CI tools automatically mount your workspace that contains the project sources into your Docker container, you may omit the `-v` command, which mounts your current working directory.

- **Without Docker:**

In your shell, execute the following commands:

```
npm run-script test
```

```
npm run-script linting
```

### 3. Deploy

Build

Test

Deploy

Depending on whether you work or do not work with Docker, use one of the following commands to deploy your application to the Neo environment. In a shell environment, provide the required variables: SAP BTP host, account, and user credentials. Please refer to the documentation of your specific CI tool for how to store variables.

To upload the resulting `out.mtar` file from the build step to SAP BTP, use the `deploy-mta` command of the Console Client for the Neo environment, which you can download from <https://tools.hana.ondemand.com/#cloud> and which is part of any SAP BTP SDK for the Neo environment. For more information, see [Console Client for the Neo Environment](#).

**⚠ Caution**

Don't put credentials in the call but use the credential mechanism of your CI tool, instead.

- **With Docker:**

Adapt the following command by replacing the placeholders in brackets with your actual values and execute it.

```
docker run -v "${PWD}":/project piper/neo-cli:latest neo.sh deploy-mta --host ${HOST} --account ${ACCOUNT} --source out.mtar --synchronous --user ${USER} --password ${PASS}
```

**i Note**

As many CI tools automatically mount your workspace that contains the project sources into your Docker container, you may omit the `-v` command, which mounts your current working directory.

- **Without Docker:**

Place the SDK for the Neo environment of your choice on the build machine and call it.

```
/path/to/cloud-platform-sdk/tools/neo.sh deploy-mta --host ${HOST} --account ${ACCOUNT} --source out.mtar --synchronous --user ${USER} --password ${PASS}
```

For more options, see [Console Client Commands](#).

## Result

You have built a basic CI/CD pipeline, which you can enhance according to your needs, for example, by adding additional tests and manual release steps.

**i Note**

This guide also provides other procedures to enhance your finished CI/CD pipelines. See [Procedures for CI/CD Pipelines \[page 5\]](#).

## 2.2 Apply CI/CD to SAP Fiori Development on an SAP Fiori Front-End Server

Implement a CI/CD pipeline for the development of SAPUI5/SAP Fiori applications on an SAP Fiori front-end server.

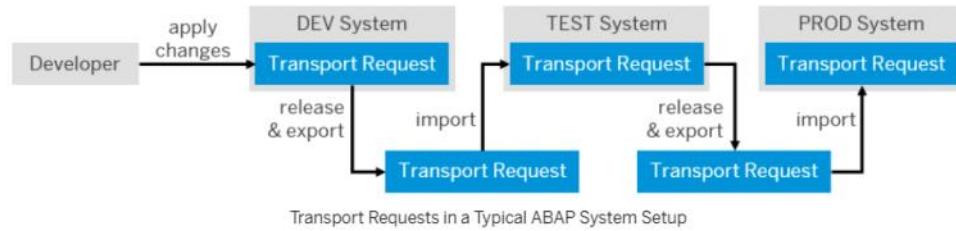
**→ Tip**

If you use Jenkins or plan to use it, have a look at [project "Piper"](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

## Context

The most common ABAP system setup is a staging landscape that consists of three different systems: One for development (DEV), one for acceptance testing (TEST), and a productive one (PROD). In this order, they are linked to each other through transport routes. Following these routes, transport requests are exported from one system and imported into the next. The following graphic illustrates this procedure:



Your staging landscape must at least consist of two different systems: DEV and PROD. Depending on your needs, however, you can combine as many systems as you like.

### i Note

The following procedure describes the transport from one system to another. Depending on how many systems you use, repeat parts of it as often as necessary. For more information, see section [The Transport Management System](#).

When combining continuous integration with the ABAP life-cycle management, the CI process ensures the quality of the code implemented outside the ABAP system. Through minification and the generation of a preload, it converts the sources into the correct format, runs automated tests and code checks, and produces an artifact that is ready to be uploaded to the ABAP development system. From there, the ABAP system takes over and transports the changes to the test system, and finally to the productive one.

Therefore, the described workflow consists of two distinct parts:

### → Tip

Expand the following sections for more detailed information.

## The Continuous Integration Process

The CI process outside the ABAP system contains the following steps:



In detail, this process works as follows:

1. In a source code management tool of your choice, apply changes to your SAPUI5/SAP Fiori project.
2. Merge your changes with the master branch. Thereby, the CI process is triggered.

- The CI process runs. It includes the following tasks:
  - Static code checks for JavaScript
  - Automated tests
  - Minification, which means that all comments and white spaces are removed from the JavaScript sources to reduce the load on the network
  - Generating a preload, which means that all JavaScript files are merged into a single file to reduce the number of requests from the browser to the server
  - Packaging the application into a ZIP file

The last three tasks of the CI process constitute the **Build** step.

### **The Transport Management System**

The mainly automated delivery process with the Transport Management System contains the following steps:



In detail, this process works as follows:

- Immediately after a successful CI build, the build scheduler is triggered. It performs the following tasks:
  - Creating a new, individual transport request in the ABAP development system
  - Uploading the application to the ABAP development system
  - Releasing the transport request
- Manually import the transport request into the following ABAP system.

#### i Note

If in your ABAP system setup, you use more than two different systems, repeat the **Release and Export** and **Import** steps as often as necessary.

### **OData vs. RFC**

To orchestrate the Transport Management System, your CI/CD pipeline directly communicates with the ABAP development system. Depending on which version of SAP NetWeaver you use, choose between the following protocols:

- Open Data Protocol (OData)**  
OData is a REST-based web protocol for querying and updating data as well as for applying and building on web technologies. It is used by SAP Gateway and recommended for SAP NetWeaver systems **>= 7.5 SPS12**. For more information, see [SAP Gateway, REST and OData](#).
- Remote Function Call (RFC)**  
RFC calls a function to be executed in a remote system and is the standard SAP interface for communication between SAP NetWeaver systems. For more information, see [RFC](#).

#### i Note

Although you can use RFC for all SAP NetWeaver systems, we recommend OData for newer ones (>= 7.5 SPS12).

Depending on which protocol you use, choose one of the following procedures:

- [Apply CI/CD to SAP Fiori Development on an SAP Fiori Front-End Server with OData \[page 14\]](#)
- [Apply CI/CD to SAP Fiori Development on an SAP Fiori Front-End Server with RFC \[page 18\]](#)

For an overview of all procedures in this guide, see [Procedures for CI/CD Pipelines \[page 5\]](#).

### 2.2.1 Apply CI/CD to SAP Fiori Development on an SAP Fiori Front-End Server with OData

Implement a CI/CD pipeline for the development of SAPUI5/SAP Fiori applications on an SAP Fiori front-end server with OData.

#### → Tip

If you use Jenkins or plan to use it, have a look at [Project "Piper"](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Context

This procedure allows you to implement a CI/CD pipeline to develop a SAPUI5/SAP Fiori application locally and to run it on an SAP Fiori front-end server using an OData service.

The **SAP Fiori front-end server** is an add-on product for SAP NetWeaver Application Server for ABAP (AS ABAP). See [SAP Fiori front-end server](#).

The **OData service** is an interface of the Change and Transport System (CTS) with which you can manage transport requests and upload your SAPUI5/SAP Fiori application.

### Prerequisites

- You have an SAPUI5/SAP Fiori application as source in a source code management system of your choice.
- You have installed the **SAP component SAP\_UI 753** or higher on your ABAP system.
- You have enabled the OData service to load data to the [SAPUI5 ABAP repository](#).
- You have the [S\\_DEVELOP authorization](#) to perform operations in your SAPUI5 ABAP repository.

## Procedure

Use the following procedure to create a pipeline in a CI/CD tool of your choice. The pipeline consists of two distinct parts: a **continuous integration** process and an **ABAP life-cycle management** process.

It uses **npm** as a

- package manager to set up the required environment on your build system,
- task runner to run and automate the pipeline steps.

For more information, see [npm](#).

### → Recommendation

Use the containerization platform **Docker** to avoid scrambling your build system. See [Docker](#).

### Continuous Integration



The continuous integration process comprises the following steps:

- The **Build** step, which builds your SAPUI5/SAP Fiori application.
- The **Test** step, which runs tests on your SAPUI5/SAP Fiori application.

### Preparing Your Build System

To prepare your build system, proceed as follows:

1. If you don't want to use Docker, install the following dependencies on your build machine:
  - [Node.js](#)
  - [CM Client](#)
2. Create a `package.json` file in the top-level directory of your project, if it doesn't exist yet. See [package.json](#).  
Add the following lines:

```
{  
  ...  
  "scripts": {  
    "lint": "eslint webapp",  
    "uiveri5": "uiveri5",  
    "test": "npm run lint && npm run uiveri5",  
    "build": "ui5 build --clean-dest",  
    "build-self-contained": "ui5 build self-contained -a --clean-dest",  
    "start": "ws --compress -d dist"  
  },  
  ...  
  "devDependencies": {  
    "@ui5/cli": "^2.11.2",  
    "eslint": "^7.29.0",  
    "local-web-server": "^4.2.1",  
  }  
  ...  
}
```

```
}
```

## Build

To build your SAPUI5/SAP Fiori application, proceed as follows:

- In your shell, execute the following command:

```
docker run -v "$(PWD)":/project --workdir "/project" node:latest bash -c "npm run-script build"
```

- If you don't use Docker, run the npm script in your shell:

```
npm run-script build
```

## Test

To run tests on your SAPUI5/SAP Fiori application, proceed as follows:

- In your shell, execute the following command:

```
docker run -v "$(PWD)":/project --workdir "/project" node:latest bash -c "npm run-script test"
```

- If you don't use Docker, run the npm script in your shell:

```
npm run-script test
```

The test script executes **lint** and **uiVeri5** tests.

### i Note

For more information about how to create a uiVeri5 test, see [UIVeri5](#). You can, however, substitute UIVeri5 tests with any other automated tests you have implemented.

## The ABAP Life-Cycle Management

Run the following steps to deliver and release your SAPUI5/SAP Fiori application:

- The **Upload** step, which uploads your SAPUI5/SAP Fiori application into a transport request of your developer system.
- The **Release & Export** step, which releases and exports your transport request to be imported into the next system of the transport route.
- The **Import** step, which imports your exported transport request into the next system of the transport route.

For more information, see [Transport Requests in a Typical ABAP System Setup](#)

### Upload



To upload a file into your transport request, proceed as follows:

1. Create a transport request, if it is not already existing:
  - o Use the **CM Client** if you want to automate the creation. See [CM Client](#).
  - o In your shell, execute the following command:

```
docker run ppipler/cm-client:latest cmclient --endpoint "<ENDPOINT>" --user "<USER>" --password "<PASSWORD>" --backend-type CTS create-transport --target-system "<TARGET SYSTEM>" --transport-type "<TRANSPORT TYPE>" --owner "<OWNER>" --description "<DESCRIPTION>"
```

- o Without Docker, run the CM Client in your shell:

```
cmclient --endpoint "<ENDPOINT>" --user "<USER>" --password "<PASSWORD>" --backend-type CTS create-transport --target-system "<TARGET SYSTEM>" --transport-type "<TRANSPORT TYPE>" --owner "<OWNER>" --description "<DESCRIPTION>"
```

- o Use the [Transport Organizer Web UI](#) of the **SAP Transport Management System** if you want to manually create the transport request.
2. Use **SAP Fiori Tools** to upload your SAPUI5/SAP Fiori application. See [SAP Fiori Tools](#).

- o In your shell, execute the following command:

```
docker run --env ABAP_USER=<USER> --env ABAP_PASSWORD=<PASS> -v "$PWD":/project --workdir "/project" node:latest bash -c "npm run-script upload -- --noConfig -f -y --username ABAP_USER --password ABAP_PASSWORD --url <URL_ENDPOINT> --client <CLIENT> --transport <TRANSPORT_ID> --package <PACKAGE> --name <APP_NAME> --description \"<DESCRIPTION>\""
```

- o Without Docker, run the npm script in your shell:

```
export ABAP_USER=<USER>
export ABAP_PASSWORD=<PASS>
npm run-script upload -- --noConfig -f -y --username ABAP_USER --password ABAP_PASSWORD --url <URL_ENDPOINT> --client <CLIENT> --transport <TRANSPORT_ID> --package <PACKAGE> --name <APP_NAME> --description "<DESCRIPTION>"
```

For more information about the command and its parameters, see [fiory deploy](#).



## Release & Export

To deliver and release your SAPUI5/SAP Fiori application, use SAP Logon and proceed as follows:

1. In SAP Logon, open the transaction `stms`.
2. Choose [Transport Organizer Web UI](#).
3. Select your transport request and choose *Release*.

## Import

To import your transport request into the following system, use SAP Logon and proceed as follows:

1. In SAP Logon, open the transaction `stms`.

2. Choose *Import Overview*.
3. Choose your target system and choose *Display Import Queue*.
4. To import the waiting request, select it and choose *OK*.

## Result

You have combined the ABAP life-cycle management with a basic CI pipeline, which you can enhance according to your needs.

### i Note

This guide also provides procedures to enhance your finished CI/CD pipelines. See [Procedures for CI/CD Pipelines \[page 5\]](#).

## 2.2.2 Apply CI/CD to SAP Fiori Development on an SAP Fiori Front-End Server with RFC

Implement a CI/CD pipeline for the development of SAPUI5/SAP Fiori applications on an SAP Fiori front-end server with RFC.

### → Tip

If you use Jenkins or plan to use it, have a look at [project "Piper"](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

## Prerequisites

- You have an SAPUI5/SAP Fiori application as source in a source code management system of your choice.
- In the top level directory of your project, you have a file called `Gruntfile.js`, which contains the following entries:

```
module.exports = function (grunt) {
    "use strict";
    grunt.loadNpmTasks("@sap/grunt-sapui5-bestpractice-build");
    grunt.config.merge({ compatVersion: "1.38" });
    grunt.registerTask("default", [
        "clean",
        "lint",
        "build"
    ]);
    grunt.loadNpmTasks("@sap/grunt-sapui5-bestpractice-test");
    grunt.registerTask("unit_and_integration_tests", ["test"]);
    grunt.config.merge({
        coverage_threshold: {

```

```

        statements: 0,
        branches: 100,
        functions: 0,
        lines: 0
    }
);
}

```

For more information on how to set up your Grunt build in SAP Web IDE Full-Stack, see [Grunt Build in SAP Web IDE Full-Stack](#).

- In the top level directory of your project, you have a file called `package.json`, which contains the following lines:

```

"devDependencies": {
    "@sap/grunt-sapui5-bestpractice-build": "1.4.1",
    "@sap/grunt-sapui5-bestpractice-test": "2.0.1"
},
"scripts": {
    "build": "ui5 build --a",
    "test": "uiveri5"
    "linting": "eslint ."
}

```

#### Note

The build script executes the UI5 command line tool. In this example, the test script runs UIVeri5. You can, however, substitute `uiveri5` with any other automated tests you have implemented.

- As it prevents clutter on your build system and improves both maintainability and flexibility, we recommend working with Docker. Refer to the documentation of your CI tool to check whether it supports the usage of Docker containers in its pipelines.

#### Caution

Please check with your IT and security departments how to handle Docker images from public sources.

Depending on whether you want or don't want to work with Docker, make sure that you meet the following additional prerequisites:

- **With Docker:**  
You have built the [RFC CTS+ Dockerfile](#).
- **Without Docker:**
  - You have installed NodeJS on your build machine.
  - You have downloaded and installed the [SAP NetWeaver RFC Library](#).

## Procedure

Use the following procedure to create a pipeline in a CI/CD tool of your choice. It consists of two distinct parts: The continuous integration process and the ABAP life-cycle management. For more information, see [Apply CI/CD to SAP Fiori Development on an SAP Fiori Front-End Server \[page 11\]](#).

## The Continuous Integration Process



1. To install all needed dependencies for your application, call Grunt, and execute the tasks in your `gruntfile.js`, choose one of the following options:

- o **With Docker:**

In your shell, execute the following commands:

```
docker run -v "${PWD}":/project node:latest npm install
```

```
docker run -v "${PWD}":/project node:latest node_modules/grunt-cli/bin/grunt default createZip
```

### i Note

The `-v` command mounts your current working directory. As many CI tools automatically mount the workspace, which contains the project sources into your Docker container, you may omit it.

- o **Without Docker:**

In your shell, execute the following commands:

```
npm install
```

```
node_modules/grunt-cli/bin/grunt default createZip
```

2. To add automated tests to your pipeline, choose one of the following options:

- o **With Docker:**

Use a standard node image that fits your requirements from the Docker Hub. In your shell, execute the following commands:

```
docker run -v "${PWD}":/project node:latest npm run-script test
```

```
docker run -v "${PWD}":/project node:latest npm run-script linting
```

- o **Without Docker:**

In your shell, execute the following commands:

```
npm run-script test
```

```
npm run-script linting
```

### → Tip

For SAPUI5/ SAP Fiori, we recommend implementing UIVeri5 and OPA5 tests. See, for example [Add Automated System Tests to Your CI/CD Pipeline](#).

3. Trigger your pipeline to test the CI build.

## The ABAP Life-Cycle Management



1. To define the logic for RFC connections, create a Gruntfile with the name `run-rfc-task.js` on the top level of your directory, and copy the following code into it:

```
"use strict";
var rfc = require("node-rfc");
var fs = require("fs");
module.exports = function(grunt) {
    // Project specific variables
    var abapDevelopmentUser = process.env.ABAP_DEVELOPMENT_USER;
    var abapDevelopmentPassword = process.env.ABAP_DEVELOPMENT_PASSWORD;
    var abapDevelopmentServer = process.env.ABAP_DEVELOPMENT_SERVER;
    var abapDevelopmentInstance = process.env.ABAP_DEVELOPMENT_INSTANCE;
    var abapDevelopmentClient = process.env.ABAP_DEVELOPMENT_CLIENT;
    var abapApplicationName = process.env.ABAP_APPLICATION_NAME;
    var abapApplicationDesc = process.env.ABAP_APPLICATION_DESC;
    var abapPackage = process.env.ABAP_PACKAGE;
    var zipFileURL = process.env.ZIP_FILE_URL;
    var codePage = process.env.CODE_PAGE;
    var acceptUnixStyleLineEndings = process.env.ABAP_ACCEPT_UNIX_STYLE_EOL;
    var transportDescription = process.env.TRANSPORT_DESCRIPTION;
    var targetDir = process.env.SAPDATAADIR;
    var verbose = process.env.VERBOSE;
    var failUploadOnWarning = process.env.FAIL_UPLOAD_ON_WARNING;
    // Global Variables
    var ctsDataFile = targetDir + "/CTS_Data.txt";
    // Project configuration.
    var abapConn = {
        user: abapDevelopmentUser,
        passwd: abapDevelopmentPassword,
        ashost: abapDevelopmentServer,
        sysnr: abapDevelopmentInstance,
        client: abapDevelopmentClient
    };
    grunt.initConfig({
        pkg: grunt.file.readJSON("package.json"),
        createTransportRequest: {
            options: {
                conn: abapConn,
                author: abapDevelopmentUser,
                description: transportDescription,
                verbose: verbose
            }
        },
        uploadToABAP: {
            options: {
                conn: abapConn,
                zipFileURL: zipFileURL,
                codePage: codePage,
                acceptUnixStyleLineEndings: acceptUnixStyleLineEndings,
                verbose: verbose,
                failUploadOnWarning: failUploadOnWarning
            }
        },
        releaseTransport: {
            options: {

```

```

        conn: abapConn,
        verbose: verbose
    }
}
});
var rfcConnect = function(functionModule, importParameters, gruntContext)
{
    return new Promise(function(resolve, reject) {
        var verbose = gruntContext.options().verbose
        var conn = gruntContext.options().conn;
        var client = new rfc.Client(conn);
        grunt.log.writeln("RFC client lib version:", client.version);
        client.connect(function(err) {
            if (err) { // check for login/connection errors
                grunt.log.errorln("could not connect to server", err);
                return reject();
            }
            // invoke remote enabled ABAP function module
            grunt.log.writeln("Invoking function module", functionModule);
            client.invoke(functionModule,
                importParameters,
                function(err, res) {
                    if (err) { // check for errors (e.g. wrong parameters)
                        grunt.log.errorln("Error invoking",
                            functionModule, err);
                        return reject();
                    }
                    client.close();
                    if(verbose == 'true') {
                        grunt.log.writeln("Result:", res);
                    }
                    return resolve(res);
                });
        });
    });
};
grunt.registerTask("createTransportRequest", "Creates an ABAP Transport Request", function() {
    grunt.log.writeln("Creating Transport Request");
    var importParameters = {
        AUTHOR: this.options().author,
        TEXT: this.options().description
    };
    var done = this.async();
    rfcConnect("BAPI_CTRREQUEST_CREATE", importParameters, this)
        .then(
            function(returnValue) {
                if (returnValue.RETURN.TYPE == "E" ||
                    returnValue.RETURN.TYPE == "W") {
                    grunt.log.errorln("Error invoking
                        BAPI_CTRREQUEST_CREATE.");
                    grunt.log.writeln("Return:", returnValue);
                    done(false);
                    return;
                }
                if (returnValue.REQUESTID == "") {
                    grunt.log.errorln("Error invoking
                        BAPI_CTRREQUEST_CREATE.");
                    grunt.log.writeln("Transport request could not be
                        created.");
                    grunt.log.errorln(returnValue.RETURN.MESSAGE);
                    done(false);
                    return;
                }
                grunt.log.writeln("Transport request", returnValue.REQUESTID,
                    "created.");
                if (fs.existsSync(targetDir) === false) {

```

```

        fs.mkdirSync(targetDir);
    }
    fs.writeFile(ctsDataFile,
      JSON.stringify(
        { REQUESTID: returnValue.REQUESTID }
      ),
      function(err) {
        if (err) {
          grunt.log.errorln("Error Creating file:", err);
          done(false);
          return;
        }
        grunt.log.writeln("Created file:", ctsDataFile);
        done();
      }
    ),
    function() {
      done(false);
    });
  });
  grunt.registerTask("uploadToABAP", "Uploads the application to the ABAP System", function(transportRequest) {
    grunt.log.writeln("Uploading to ABAP");
    if (!transportRequest) {
      grunt.log.errorln("No Transport request specified.");
      return (false);
    }
    grunt.log.writeln("Transport request:", transportRequest);
    var url = this.options().zipfileURL;
    var verbose = this.options().verbose;
    var failUploadOnWarning = this.options().failUploadOnWarning;
    var importParameters = {
      IV_URL: url,
      IV_SAPUI5_APPLICATION_NAME: abapApplicationName,
      IV_SAPUI5_APPLICATION_DESC: abapApplicationDesc,
      IV_PACKAGE: abapPackage,
      IV_WORKBENCH_REQUEST: transportRequest,
      IV_TEST_MODE: "-",
      IV_EXTERNAL_CODE_PAGE: this.options().codePage,
      IV_ACCEPT_UNIX_STYLE_EOL:
      this.options().acceptUnixStyleLineEndings
    };
    var done = this.async();
    grunt.log.writeln("Uploading application from", url);
    rfcConnect("/UI5/REPO_LOAD_FROM_ZIP_URL", importParameters, this)
      .then(
        function(returnValue) {
          if (returnValue.EV_SUCCESS == "E" || (failUploadOnWarning != "false" && returnValue.EV_SUCCESS == "W")) {
            grunt.log.errorln("Error invoking", "/UI5/REPO_LOAD_FROM_ZIP_URL");
            grunt.log.writeln("Return:", returnValue);
            done(false);
            return;
          } else if (returnValue.EV_SUCCESS == 'S') {
            grunt.log.writeln("Application uploaded.");
            done();
          } else {
            grunt.log.writeln("Invalid return status (EV_SUCCESS): " +
              returnValue.EV_SUCCESS);
            done(false);
            return;
          }
          if(verbose == 'true' ) {
            grunt.log.writeln("Return:", returnValue);
          }
        }
      );
  });

```

```

        grunt.log.writeln("Application uploaded.");
        done();
    },
    function() {
        done(false);
    });
});
grunt.registerTask("releaseTransport", "Releases an ABAP Transport Request", function(transportRequest) {
    grunt.log.writeln("Releasing Transport Request");
    if (!transportRequest) {
        grunt.log.errorln("No Transport request specified.");
        return (false);
    }
    grunt.log.writeln("Transport request:", transportRequest);
    var importParameters = {
        REQUESTID: transportRequest,
        COMPLETE: "X",
        BATCH_MODE: "X"
    }
    var done = this.async();
    rfcConnect("BAPI_CTRREQUEST_RELEASE", importParameters, this)
        .then(
            function(returnValue) {
                if (returnValue.RETURN.TYPE == "E" || returnValue.RETURN.TYPE ==
                    "W") {
                    grunt.log.errorln("Error invoking",
                        "BAPI_CTRREQUEST_RELEASE");
                    grunt.log.writeln("Return:", returnValue);
                    done(false);
                    return;
                }
                grunt.log.writeln("Transport request released.");
                done();
            },
            function() {
                done(false);
            });
    });
});

```

This Gruntfile implements the following tasks, which are passed as parameters to the `grunt` command in the next step:

Tasks in the `run-rfc-task.js`

| Task                                | Function                                                    |
|-------------------------------------|-------------------------------------------------------------|
| <code>createTransportRequest</code> | Create a transport request in the ABAP system.              |
| <code>uploadToABAP</code>           | Upload the application as ZIP file to the ABAP system.      |
| <code>releaseTransport</code>       | Release the transport request with all its transport tasks. |

2. To execute the tasks from the `run-rfc-task.js`, choose one of the following options:

- **With Docker:**

In your shell, execute the following commands:

```
docker run -v "${PWD}":/project node:latest npm install
```

```
docker run -v "${PWD}":/project node:latest node_modules/grunt-cli/bin/grunt --gruntfile run-rfc-task.js createTransportRequest uploadToABAP releaseTransport
```

- **Without Docker:**

In your shell, execute the following commands:

```
npm install
```

```
node_modules/grunt-cli/bin/grunt --gruntfile run-rfc-task.js createTransportRequest uploadToABAP releaseTransport
```

Build

Test

Upload

Release  
and Export

Import

Use SAP Logon to manually import your transport request into the following system:

1. In SAP Logon, open the transaction `STMS`.
2. Choose *Import Overview*.
3. Select your target system and choose *Display Import Queue*.
4. To import the waiting request, select it and choose *OK*.

## Result

You have combined the ABAP life-cycle management with a basic CI pipeline, which you can enhance according to your needs.

**i Note**

This guide also provides procedures to enhance your finished CI/CD pipelines. See [Procedures for CI/CD Pipelines \[page 5\]](#).

## 2.3 Apply CI/CD to SAP HANA Extended Application Services, Advanced Model Development

Implement a CI/CD pipeline for the development of SAP HANA extended application services, advanced model applications.

**→ Tip**

If you use Jenkins or plan to use it, have a look at [project "Piper"](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

## Context

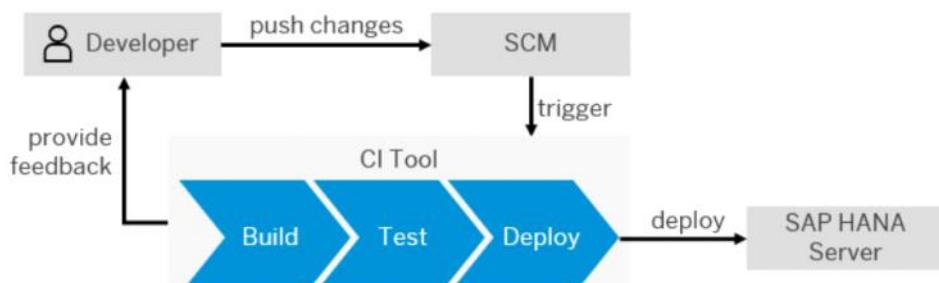
This procedure implements a CI/CD process for a multitarget application that runs on an SAP HANA extended application services, advanced model server.

An SAP HANA extended application services, advanced model application can consist of a couple of modules (for both UI and backend). To bundle and deploy these modules, the multitarget application archive format is used. A multitarget application (MTA) is a package that comprises multiple application and resource modules, which share a common lifecycle even though they might have been created with different technologies and deployed to different runtimes. To create an MTA, you bundle the modules, describe them along with their interdependencies to other modules, services, and interfaces, and package them. For more information, see [The Multitarget Application Model](#).

A CI/CD pipeline for SAP HANA extended application services, advanced model comprises the following steps:

1. Push your code changes to a source code management (SCM) tool of your choice. The push event to the SCM system triggers the CI process.
2. In the CI build, the Cloud MTA Build Tool (MBT) triggers the technology-specific compilers for the respective modules contained in the MTA. For more information, see [Cloud MTA Build Tool](#).
3. The Cloud MTA Build Tool packages the artifacts from each module into one archive file with the extension `.mtar`.
4. The build result is automatically deployed into an environment for automated testing during the CI build. The CI build may contain different tests, such as static code checks for the JavaScript sources (ESLint) and automated user interface tests (for example, [Add Automated System Tests with the SAPUI5 Test Recorder to Your CI/CD Pipeline](#)).
5. The MTA archive is deployed to the production environment.

The following graphic illustrates this procedure:



CI/CD in SAP HANA Extended Application Services, Advanced Model Development

## Prerequisites

- As it prevents clutter on your build system and improves both maintainability and flexibility, we recommend working with Docker. Refer to the documentation of your CI tool to check whether it supports the usage of Docker containers in its pipelines.

### ⚠ Caution

Please check with your IT and security departments how to handle Docker images from public sources.

- If you don't want to work with Docker, make sure that you have installed the [XS Advanced Command-Line Client](#).

In your MTA, you can have various modules. Depending on which module type you intend to use in them, choose from the following sets of additional prerequisites:

### → Tip

Expand the section that fits your scenario.

## SAP Fiori

- You have an SAPUI5/SAP Fiori application as module in the sources of your MTA application. For building it, use the [UI5 Tooling](#).
- On the top level of your directory, you have a file named `mta.yaml`, which contains the following entry in the modules section:

```
modules:
  - name: webapp
    type: html5
    path: .
    parameters:
      disk-quota: 256M
      memory: 256M
    build-parameters:
      builder: npm
```

- On the top level of your directory, you have a file named `package.json`, which contains the following build script:

```
"scripts": {
  "build": "ui5 build --a",
  "test": "uiveri5"
  "linting": "eslint ."
}
```

### ℹ Note

The build script executes the UI5 command-line tool. In this example, the test script runs UIVeri5. You can, however, substitute `uiveri5` with any other automated tests you have implemented.

## Java

- You have a Java application as module in the sources of your MTA application.
- On the top level of your directory, you have a file named `mta.yaml` which contains the following:

#### Sample Code

```
modules:
  - name: webapp
    type: java
    path: .
    parameters:
      disk-quota: 256M
      memory: 1024M
    build-parameters:
      build-result: 'target/*.jar'
      builder: mvn
```

- On the top level of your Java project, you have a pom.xml, which controls the Maven build.

## Procedure

In this procedure, we focus on the core stages of a CI/CD pipeline: build, test, and deploy.

### → Tip

You can combine and extend these simple build, test, and deploy steps to implement more complex pipelines.

#### 1. Build



The build optimizes and packages your project sources. Use the Cloud MTA Build Tool (MBT) to orchestrate the technical build steps using either npm or Maven. Depending on your configuration, you can also add linting and unit tests. The build produces an out.mtar file, which is used in the following deployment stage. See step 3: **Deploy**.

For more information on how to download, set up, and run the Cloud MTA Build Tool, see [Cloud MTA Build Tool](#).

To run the build, choose one of the following options:

- With Docker:

Execute the following command in the directory that contains your project sources:

```
docker run -v "${PWD}":/project devxci/mbtc:latest mbt build -p xsa
```

### i Note

As many CI tools automatically mount your workspace that contains the project sources into your Docker container, you may omit the `-v` command, which mounts your current working directory.

- **Without Docker:**

If you provide all dependencies on the build server, you can build your project without Docker by placing the Cloud MTA Build Tool directly on your build system. See [Cloud MTA Build Tool](#).

Execute the following command in the directory that contains your project sources:

```
mbt build -p xsa
```

## 2. Test

Build

Test

Deploy

Depending on your requirements and the setup of your project, consider adding automated tests to it. For SAPUI5/ SAP Fiori, we recommend implementing UIVeri5 and OPA5 tests. See, for example, [Add Automated System Tests with the SAPUI5 Test Recorder to Your CI/CD Pipeline](#).

To add automated tests, choose one of the following options:

- **With Docker:**

Use a Docker image that fits your requirements, for example, `node` for NodeJS.

```
docker run -v "${PWD}":/project node:latest <execute your build script>
```

**i Note**

As many CI tools automatically mount your workspace that contains the project sources into your Docker container, you may omit the `-v` command, which mounts your current working directory.

- **Without Docker:**

In your shell, execute your test script.

## 3. Deploy

Build

Test

Deploy

Depending on whether you work or do not work with Docker, use one of the following commands to deploy your application to SAP HANA.

**⚠ Caution**

Don't write credentials into a file but use the credential mechanism of your CI tool, instead.

- **With Docker:**

If you want to use our XS command-line Dockerfile, you have to build it locally, first. See [XS Command-Line Client Dockerfile](#).

Adapt the following command with your actual values and execute it:

```
docker run -v "${PWD}":/home piper/xs-cli:latest xs api <YOUR SAP HANA  
ENDPOINT> && xs login -u <USERNAME> -p <PASSWORD> && xs push
```

- **Without Docker:**

Adapt the following commands and in this order, execute them:

- `xs api <YOUR SAP HANA ENDPOINT>`
- `xs login -u <USERNAME> -p <PASSWORD>`
- `xs bg-deploy`

## Result

You have created a basic CI/CD pipeline, which you can extend according to your needs, for example, by adding additional tests and manual release steps.

### i Note

This guide also provides procedures to enhance your finished CI/CD pipelines. See [Procedures for CI/CD Pipelines \[page 5\]](#).

## 2.4 Integrate SAP Cloud Transport Management into Your CI/CD Pipeline

Add an enterprise-ready change and release management process to your CI/CD pipeline and enable the transport of cloud-based applications on SAP BTP between several stages.

### → Tip

If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Integrate SAP Cloud Transport Management Into Your CI/CD Pipeline](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

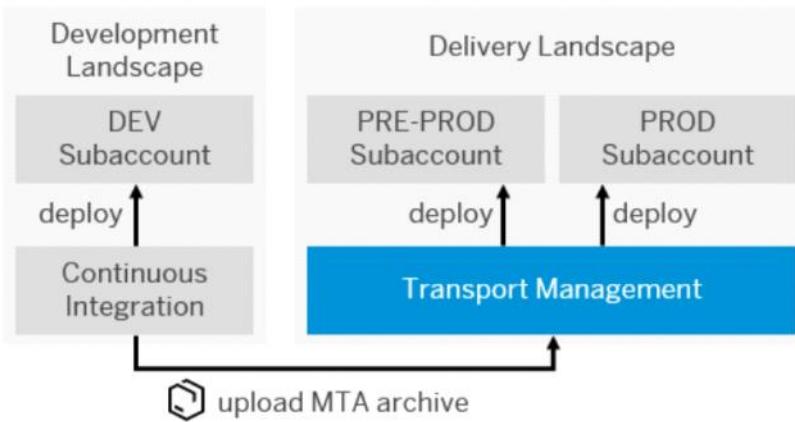
## Context

This procedure explains how to upload a [multitarget application](#) out of a CI/CD pipeline to SAP Cloud Transport Management and then import it into its target environment.

SAP Cloud Transport Management allows you to manage the transport of development artifacts and application-specific content between different SAP BTP accounts. It adds transparency to the audit trail of

changes so that you get information about who performed which changes in your production accounts and when they did it. At the same time, the Transport Management service enables a separation of concerns: For example, a developer of an application or SAP BTP content artifacts can trigger the propagation of changes, while the resulting transport is handled by a central operations team. For more information, see [SAP Cloud Transport Management](#).

The following graphic provides an overview about the interplay between continuous integration and SAP Cloud Transport Management:



Interplay of Continuous Integration and SAP Cloud Transport Management

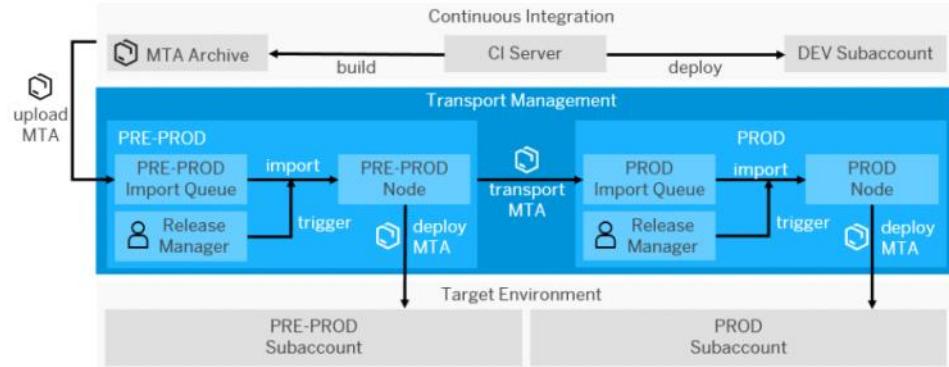
## Prerequisites

- You have an existing CI pipeline, which you want to enhance with SAP Cloud Transport Management.
- You have an MTA project and the folder structure of its sources corresponds to the standard MTA structure. For more information, see [The Multitarget Application Model](#).
- You have access to SAP Cloud Transport Management. See [Provide Access to SAP Cloud Transport Management](#).
- You have set up SAP Cloud Transport Management and created a service key. See [Set Up the Environment to Transport Content Archives directly in an Application](#).
- You have configured your Transport Management landscape. See [Configuring the Landscape](#).

## Procedure

This procedure belongs to the **Enhance Your Pipeline** category, which means that you can use it to enhance any CI process that meets the prerequisites, for example, the one described in [Apply CI/CD to SAP Fiori Development on SAP BTP \[page 6\]](#).

The following graphic shows an example of the detailed procedure when combining continuous integration and SAP Cloud Transport Management:



Detailed Procedure When Combining CI and SAP Cloud Transport Management

The process flow contains the following steps:

1. The CI server builds a multitarget application (MTA) archive.
2. The MTA is uploaded into the import queue of the target node, which is specified in the CI pipeline (in this example, PRE-PROD).
3. The release manager manually triggers or schedules the import, which results in the physical deployment of the MTA archive into the corresponding subaccount (in this example, PRE-PROD).
4. As soon as the import is executed, a transport is triggered along the defined transport route so that the MTA archive reaches the import queue of the next node (in this example, PROD).
5. There, the physical import into the corresponding subaccount can be either triggered manually by the release manager or automatically by using the scheduling mechanisms of SAP Cloud Transport Management.

To enhance your existing CI/CD pipeline with SAP Cloud Transport Management, execute the following tasks:

1. **Upload**



1. Copy the SAP Cloud Transport Management service key and store it in the secret store of your CI server.

2. To authenticate yourself against Transport Management, adapt and use this API call:

API Call for Authenticating against Transport Management

| HTTP Method | POST                                                                                                                                                                                                                                                                                                                                              |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| URL         | <code>https://&lt;serviceKey.aaa.url&gt;/oauth/token/?grant_type=client_credentials&amp;response_type=token</code>                                                                                                                                                                                                                                |
| Headers     | <ul style="list-style-type: none"> <li>○ <b>Key:</b> Username<br/><b>Value:</b> &lt;serviceKey.aaa.clientid&gt;</li> <li>○ <b>Key:</b> Password<br/><b>Value:</b> &lt;serviceKey.aaa.clientsecret&gt;</li> </ul> <p>Use a JSON parser to extract the values <code>aaa.clientid</code> and <code>aaa.clientsecret</code> from the service key.</p> |
| Response    | You get an <b>access token</b> , which is needed for following Transport Management API calls.                                                                                                                                                                                                                                                    |

3. To upload your MTA to SAP Cloud Transport Management, adapt and use this API call:

API Call for Uploading an MTA to Transport Management

| HTTP Method | POST                                                                                                                                                                                                                          |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| URL         | <code>https://&lt;serviceKey.uri&gt;/v2/files/upload</code>                                                                                                                                                                   |
| Header      | <b>Key:</b> Authorization<br><b>Value:</b> bearer <access_token>                                                                                                                                                              |
| Body        | <ul style="list-style-type: none"> <li>○ <b>Key:</b> File<br/><b>Value:</b> &lt;file with application content&gt;</li> <li>○ <b>Key:</b> namedUser<br/><b>Value:</b> &lt;id of the user performing the request&gt;</li> </ul> |
| Response    | You get a <b>file ID</b> , which is needed for further Transport Management API calls.                                                                                                                                        |

- To upload the MTA archive to a transport node, adapt and use this API call:

API Call for Uploading an MTA Archive to a Transport Node

**HTTP Method**

POST

**URL**

`https://<serviceKey.uri>/v2/nodes/upload`

**Header**

**Key:** Authorization

**Value:** bearer <access\_token>

**Body**

«, Sample Code

```
{
  "nodeName": "PRE-PROD",
  "contentType": "MTA",
  "description": "<your
description>",
  "storageType": "FILE",
  "namedUser": "<id of the user
performing the request>",
  "entries": [
    {
      "uri": "<fileId>"
    }
  ]
}
```

## 2. Import

Your CI/CD Pipeline

Upload

Import

After successfully uploading your MTA archive to SAP Cloud Transport Management, you can use the import mechanism of Transport Management to distribute it within your transport landscape. See [Using the Import Queue](#).

Choose between the following options:

- To manually import your artifacts, see [Import Transport Requests](#).
- To schedule automated imports, see [Schedule Imports](#).

## Result

You have enhanced your CI/CD pipeline with SAP Cloud Transport Management.

### i Note

Now, you can also add change request management with SAP Solution Manager to your pipeline. See [Integrate Change Request Management with SAP Solution Manager into Your CI/CD Pipeline \[page 38\]](#).

For an overview of all procedures in this guide, see [Procedures for CI/CD Pipelines \[page 5\]](#).

## 2.5 Integrate Change Control Management with SAP Solution Manager into Your CI/CD Pipeline

Add change control management processes to your CI/CD pipeline and facilitate the synchronization of changes made both on-premise and on SAP BTP.

### → Tip

If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Build and Deploy Hybrid Applications with Jenkins and SAP Solution Manager](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Context

Change control management features help you create change requests, edit them, if necessary, and implement changes. You can choose between two different options, which you can integrate into your CI/CD pipeline:

- **Quality Gate Management**

Quality Gate Management is an out-of-the-box solution that helps you monitor all software change processes, distribute software across systems and technology stacks, and get an overview of the implementation of changes to your SAP software solution. For more information, see [Quality Gate Management](#).

- **Change Request Management**

Change Request Management allows you to manage your projects in SAP Solution Manager from end to end: Plan your change management and project, manage your resources, and physically transport changes from the development environment into the productive one. Change Request Management with SAP Solution Manager is highly customizable. For more information, see [Change Request Management](#).

Depending on which option you want to use, choose one of the following scenarios:

- [Integrate Quality Gate Management with SAP Solution Manager into Your CI/CD Pipeline \[page 36\]](#)
- [Integrate Change Request Management with SAP Solution Manager into Your CI/CD Pipeline \[page 38\]](#)

## 2.5.1 Integrate Quality Gate Management with SAP Solution Manager into Your CI/CD Pipeline

Add change management processes that are compliant with the Information Technology Infrastructure Library (ITIL) to your CI/CD pipeline and facilitate the synchronization of changes made both on-premise and on SAP BTP.

### → Tip

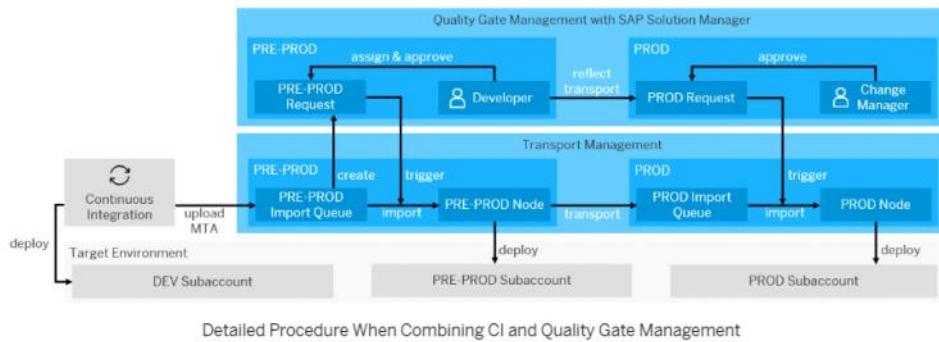
If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Build and Deploy Hybrid Applications with Jenkins and SAP Solution Manager](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Context

This scenario explains how to add Quality Gate Management to your CI/CD pipeline with an SAP Cloud Transport Management integration. For more information about Quality Gate Management with SAP Solution Manager, see [Quality Gate Management](#).

The following graphic provides an overview about the interplay between continuous integration, SAP Cloud Transport Management, and Quality Gate Management:



The interplay comprises the following steps:

- As a result of the continuous integration build, a [multitarget application \(MTA\)](#) is created, uploaded to SAP Cloud Transport Management, and attached to a new transport request in the import queue of the PRE-PROD node.
- The Transport Management transport requests are visible in SAP Solution Manager.
- The developer assigns the request to a change document.
- The developer approves the change document, which in the transport management service, triggers the import of the MTA into the PRE-PROD node.
- Through the import, the deployment of the MTA to the PRE-PROD subaccount is triggered.

6. At the same time, the import forwards the transport request with the MTA to the PROD import queue in SAP Cloud Transport Management.
7. This transport is also reflected in SAP Solution Manager, where the change document is transported to the PROD requests.
8. The change manager approves the change document for production, which in the transport management service, triggers the import of the MTA into the PROD node.
9. The import triggers the deployment of the MTA to the PROD subaccount.

## Prerequisites

- You have enhanced your CI/CD pipeline with SAP Cloud Transport Management, as described in [Integrate SAP Cloud Transport Management into Your CI/CD Pipeline \[page 30\]](#).
- You have access to an SAP Solution Manager system in version 7.2 SP10 or higher.

## Procedure

1. From Setting up [SAP BTP TMS for Change Control Management](#), execute the tasks in the following sections:
  - Set-up Steps in the Change Control Management
  - Set-up Steps in the Landscape Management Database (LMDB)
  - Set-up Steps in the Solution Administration (SLAN)
2. To prevent manual imports into the nodes that you want to be controlled by Quality Gate Management, set the flag [Controlled by SAP Solution Manager](#) in their configurations in SAP Cloud Transport Management.

## Result

SAP Cloud Transport Management is now visible in the landscape view of SAP Solution Manager. If you use your continuous delivery pipeline to upload an MTA (or another content archive) to the transport management service, the content is now attached to the import queue of the first node that is controlled by SAP Cloud Transport Management.

In SAP Solution Manager, you can now search for transport requests that are waiting in the import queue and assign them to the correct change request in the change control management. Whenever in a change request, the change reaches an appropriate state (for example, [To be tested](#)), you can trigger its import into the node.

## 2.5.2 Integrate Change Request Management with SAP Solution Manager into Your CI/CD Pipeline

Add change management processes that are compliant with the Information Technology Infrastructure Library (ITIL) to your CI/CD pipeline and facilitate the synchronization of changes made both on-premise and on SAP BTP.

### → Tip

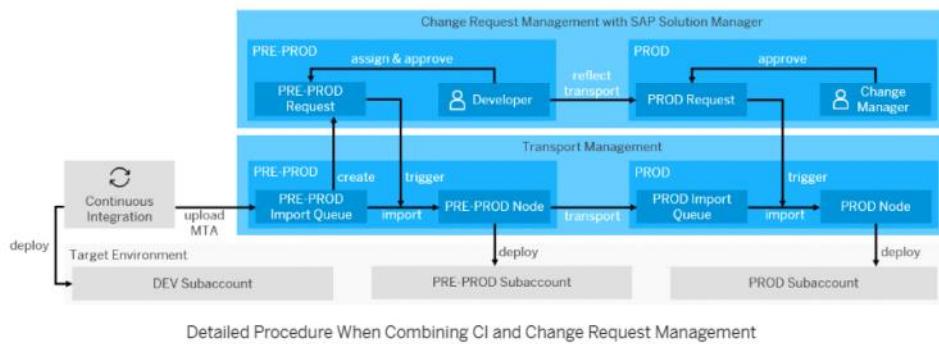
If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Build and Deploy Hybrid Applications with Jenkins and SAP Solution Manager](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Context

This scenario explains how to add Change Request Management to your CI/CD pipeline with an SAP Cloud Transport Management integration. For more information about Change Request Management with SAP Solution Manager, see [Change Request Management](#).

The following graphic provides an overview about the interplay between continuous integration, SAP Cloud Transport Management, and Change Request Management:



The interplay comprises the following steps:

- As a result of the continuous integration build, a [multitarget application \(MTA\)](#) is created, uploaded to SAP Cloud Transport Management, and attached to a new transport request in the import queue of the PRE-PROD node.
- The Transport Management transport requests are visible in SAP Solution Manager.
- The developer assigns the request to a change document.
- The developer approves the change document, which in the transport management service, triggers the import of the MTA into the PRE-PROD node.
- Through the import, the deployment of the MTA to the PRE-PROD subaccount is triggered.

6. At the same time, the import forwards the transport request with the MTA to the PROD import queue in SAP Cloud Transport Management.
7. This transport is also reflected in SAP Solution Manager, where the change document is transported to the PROD requests.
8. The change manager approves the change document for production, which in the transport management service, triggers the import of the MTA into the PROD node.
9. The import triggers the deployment of the MTA to the PROD subaccount.

## Prerequisites

- You have enhanced your CI/CD pipeline with SAP Cloud Transport Management, as described in [Integrate SAP Cloud Transport Management into Your CI/CD Pipeline \[page 30\]](#).
- You have access to an SAP Solution Manager system in version 7.2 SP10 or higher.
- You have configured Change Request Management with SAP Solution Manager, as described in [Configuring Change Request Management](#).

## Procedure

1. From Setting up [SAP BTP TMS for Change Control Management](#), execute the tasks in the following sections:
  - Set-up Steps in the Change Control Management
  - Set-up Steps in the Landscape Management Database (LMDB)
  - Set-up Steps in the Solution Administration (SLAN)
2. To prevent manual imports into the nodes that you want to be controlled by Change Request Management, set the flag [Controlled by SAP Solution Manager](#) in their configurations in SAP Cloud Transport Management.

## Result

SAP Cloud Transport Management is now visible in the landscape view of SAP Solution Manager. If you use your continuous delivery pipeline to upload an MTA (or another content archive) to the transport management service, the content is now attached to the import queue of the first node that is controlled by SAP Cloud Transport Management.

In SAP Solution Manager, you can now search for transport requests that are waiting in the import queue and assign them to the correct change request in the change control management. Whenever in a change request, the change reaches an appropriate state (for example, [To be tested](#)), you can trigger its import into the node.

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- **Without Docker:**

If you provide all dependencies on the build server, you can build your project without Docker by placing the Cloud MTA Build Tool directly on your build system. See [Cloud MTA Build Tool](#).

Execute the following command in the directory that contains your project sources:

```
mbt build -p xsa
```

## 2. Test

Build

Test

Deploy

Depending on your requirements and the setup of your project, consider adding automated tests to it. For SAPUI5/ SAP Fiori, we recommend implementing UIVeri5 and OPA5 tests. See, for example, [Add Automated System Tests with the SAPUI5 Test Recorder to Your CI/CD Pipeline](#).

To add automated tests, choose one of the following options:

- **With Docker:**

Use a Docker image that fits your requirements, for example, `node` for NodeJS.

```
docker run -v "${PWD}":/project node:latest <execute your build script>
```

**i Note**

As many CI tools automatically mount your workspace that contains the project sources into your Docker container, you may omit the `-v` command, which mounts your current working directory.

- **Without Docker:**

In your shell, execute your test script.

## 3. Deploy

Build

Test

Deploy

Depending on whether you work or do not work with Docker, use one of the following commands to deploy your application to SAP HANA.

**⚠ Caution**

Don't write credentials into a file but use the credential mechanism of your CI tool, instead.

- **With Docker:**

If you want to use our XS command-line Dockerfile, you have to build it locally, first. See [XS Command-Line Client Dockerfile](#).

Adapt the following command with your actual values and execute it:

```
docker run -v "${PWD}":/home piper/xs-cli:latest xs api <YOUR SAP HANA  
ENDPOINT> && xs login -u <USERNAME> -p <PASSWORD> && xs push
```

- **Without Docker:**

Adapt the following commands and in this order, execute them:

- `xs api <YOUR SAP HANA ENDPOINT>`
- `xs login -u <USERNAME> -p <PASSWORD>`
- `xs bg-deploy`

## Result

You have created a basic CI/CD pipeline, which you can extend according to your needs, for example, by adding additional tests and manual release steps.

### i Note

This guide also provides procedures to enhance your finished CI/CD pipelines. See [Procedures for CI/CD Pipelines \[page 5\]](#).

## 2.4 Integrate SAP Cloud Transport Management into Your CI/CD Pipeline

Add an enterprise-ready change and release management process to your CI/CD pipeline and enable the transport of cloud-based applications on SAP BTP between several stages.

### → Tip

If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Integrate SAP Cloud Transport Management Into Your CI/CD Pipeline](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

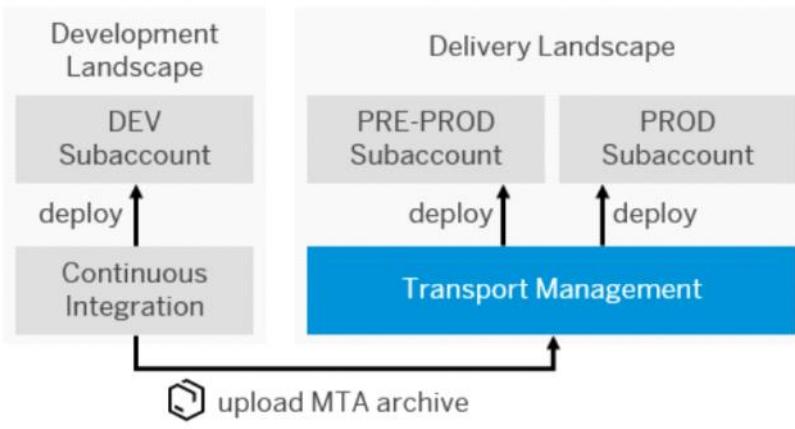
## Context

This procedure explains how to upload a [multitarget application](#) out of a CI/CD pipeline to SAP Cloud Transport Management and then import it into its target environment.

SAP Cloud Transport Management allows you to manage the transport of development artifacts and application-specific content between different SAP BTP accounts. It adds transparency to the audit trail of

changes so that you get information about who performed which changes in your production accounts and when they did it. At the same time, the Transport Management service enables a separation of concerns: For example, a developer of an application or SAP BTP content artifacts can trigger the propagation of changes, while the resulting transport is handled by a central operations team. For more information, see [SAP Cloud Transport Management](#).

The following graphic provides an overview about the interplay between continuous integration and SAP Cloud Transport Management:



Interplay of Continuous Integration and SAP Cloud Transport Management

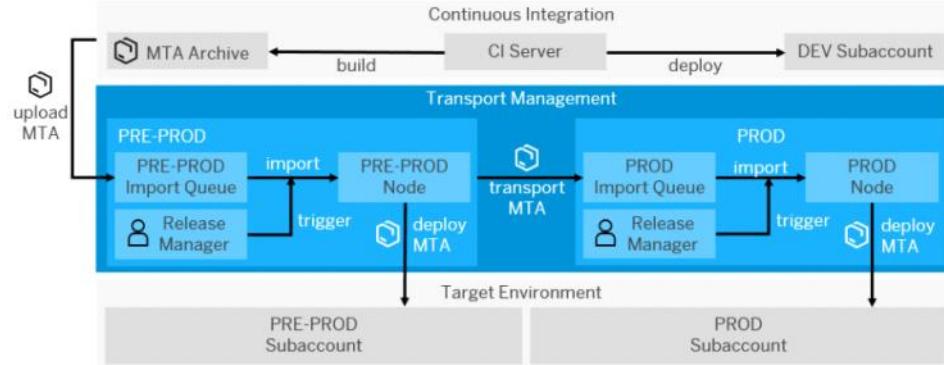
## Prerequisites

- You have an existing CI pipeline, which you want to enhance with SAP Cloud Transport Management.
- You have an MTA project and the folder structure of its sources corresponds to the standard MTA structure. For more information, see [The Multitarget Application Model](#).
- You have access to SAP Cloud Transport Management. See [Provide Access to SAP Cloud Transport Management](#).
- You have set up SAP Cloud Transport Management and created a service key. See [Set Up the Environment to Transport Content Archives directly in an Application](#).
- You have configured your Transport Management landscape. See [Configuring the Landscape](#).

## Procedure

This procedure belongs to the **Enhance Your Pipeline** category, which means that you can use it to enhance any CI process that meets the prerequisites, for example, the one described in [Apply CI/CD to SAP Fiori Development on SAP BTP \[page 6\]](#).

The following graphic shows an example of the detailed procedure when combining continuous integration and SAP Cloud Transport Management:



Detailed Procedure When Combining CI and SAP Cloud Transport Management

The process flow contains the following steps:

1. The CI server builds a multitarget application (MTA) archive.
2. The MTA is uploaded into the import queue of the target node, which is specified in the CI pipeline (in this example, PRE-PROD).
3. The release manager manually triggers or schedules the import, which results in the physical deployment of the MTA archive into the corresponding subaccount (in this example, PRE-PROD).
4. As soon as the import is executed, a transport is triggered along the defined transport route so that the MTA archive reaches the import queue of the next node (in this example, PROD).
5. There, the physical import into the corresponding subaccount can be either triggered manually by the release manager or automatically by using the scheduling mechanisms of SAP Cloud Transport Management.

To enhance your existing CI/CD pipeline with SAP Cloud Transport Management, execute the following tasks:

1. **Upload**



1. Copy the SAP Cloud Transport Management service key and store it in the secret store of your CI server.

2. To authenticate yourself against Transport Management, adapt and use this API call:

API Call for Authenticating against Transport Management

| HTTP Method | POST                                                                                                                                                                                                                                                                                                                                              |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| URL         | <code>https://&lt;serviceKey.aaa.url&gt;/oauth/token/?grant_type=client_credentials&amp;response_type=token</code>                                                                                                                                                                                                                                |
| Headers     | <ul style="list-style-type: none"> <li>○ <b>Key:</b> Username<br/><b>Value:</b> &lt;serviceKey.aaa.clientid&gt;</li> <li>○ <b>Key:</b> Password<br/><b>Value:</b> &lt;serviceKey.aaa.clientsecret&gt;</li> </ul> <p>Use a JSON parser to extract the values <code>aaa.clientid</code> and <code>aaa.clientsecret</code> from the service key.</p> |
| Response    | You get an <b>access token</b> , which is needed for following Transport Management API calls.                                                                                                                                                                                                                                                    |

3. To upload your MTA to SAP Cloud Transport Management, adapt and use this API call:

API Call for Uploading an MTA to Transport Management

| HTTP Method | POST                                                                                                                                                                                                                          |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| URL         | <code>https://&lt;serviceKey.uri&gt;/v2/files/upload</code>                                                                                                                                                                   |
| Header      | <b>Key:</b> Authorization<br><b>Value:</b> bearer <access_token>                                                                                                                                                              |
| Body        | <ul style="list-style-type: none"> <li>○ <b>Key:</b> File<br/><b>Value:</b> &lt;file with application content&gt;</li> <li>○ <b>Key:</b> namedUser<br/><b>Value:</b> &lt;id of the user performing the request&gt;</li> </ul> |
| Response    | You get a <b>file ID</b> , which is needed for further Transport Management API calls.                                                                                                                                        |

- To upload the MTA archive to a transport node, adapt and use this API call:

API Call for Uploading an MTA Archive to a Transport Node

**HTTP Method**

POST

**URL**

`https://<serviceKey.uri>/v2/nodes/upload`

**Header**

**Key:** Authorization

**Value:** bearer <access\_token>

**Body**

«, Sample Code

```
{
  "nodeName": "PRE-PROD",
  "contentType": "MTA",
  "description": "<your
description>",
  "storageType": "FILE",
  "namedUser": "<id of the user
performing the request>",
  "entries": [
    {
      "uri": "<fileId>"
    }
  ]
}
```

## 2. Import

Your CI/CD Pipeline

Upload

Import

After successfully uploading your MTA archive to SAP Cloud Transport Management, you can use the import mechanism of Transport Management to distribute it within your transport landscape. See [Using the Import Queue](#).

Choose between the following options:

- To manually import your artifacts, see [Import Transport Requests](#).
- To schedule automated imports, see [Schedule Imports](#).

## Result

You have enhanced your CI/CD pipeline with SAP Cloud Transport Management.

### i Note

Now, you can also add change request management with SAP Solution Manager to your pipeline. See [Integrate Change Request Management with SAP Solution Manager into Your CI/CD Pipeline \[page 38\]](#).

For an overview of all procedures in this guide, see [Procedures for CI/CD Pipelines \[page 5\]](#).

## 2.5 Integrate Change Control Management with SAP Solution Manager into Your CI/CD Pipeline

Add change control management processes to your CI/CD pipeline and facilitate the synchronization of changes made both on-premise and on SAP BTP.

### → Tip

If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Build and Deploy Hybrid Applications with Jenkins and SAP Solution Manager](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Context

Change control management features help you create change requests, edit them, if necessary, and implement changes. You can choose between two different options, which you can integrate into your CI/CD pipeline:

- **Quality Gate Management**

Quality Gate Management is an out-of-the-box solution that helps you monitor all software change processes, distribute software across systems and technology stacks, and get an overview of the implementation of changes to your SAP software solution. For more information, see [Quality Gate Management](#).

- **Change Request Management**

Change Request Management allows you to manage your projects in SAP Solution Manager from end to end: Plan your change management and project, manage your resources, and physically transport changes from the development environment into the productive one. Change Request Management with SAP Solution Manager is highly customizable. For more information, see [Change Request Management](#).

Depending on which option you want to use, choose one of the following scenarios:

- [Integrate Quality Gate Management with SAP Solution Manager into Your CI/CD Pipeline \[page 36\]](#)
- [Integrate Change Request Management with SAP Solution Manager into Your CI/CD Pipeline \[page 38\]](#)

## 2.5.1 Integrate Quality Gate Management with SAP Solution Manager into Your CI/CD Pipeline

Add change management processes that are compliant with the Information Technology Infrastructure Library (ITIL) to your CI/CD pipeline and facilitate the synchronization of changes made both on-premise and on SAP BTP.

### → Tip

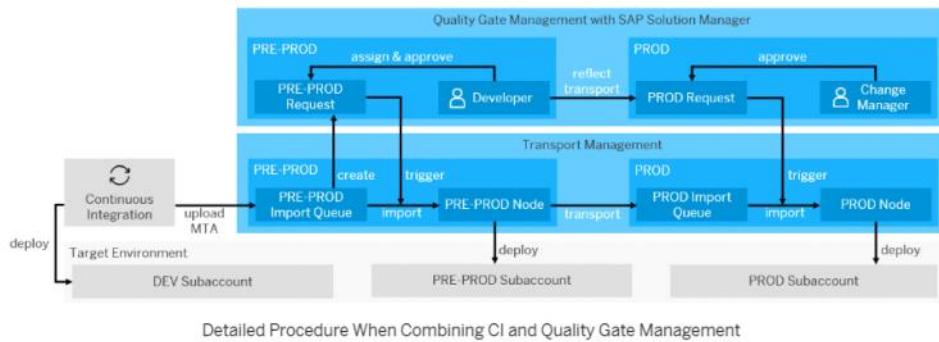
If you use Jenkins or plan to use it, have a look at the [project "Piper"](#) scenario [Build and Deploy Hybrid Applications with Jenkins and SAP Solution Manager](#), instead.

For a full overview of the different solutions SAP provides for CI/CD, see [SAP Solutions for Continuous Integration and Delivery](#).

### Context

This scenario explains how to add Quality Gate Management to your CI/CD pipeline with an SAP Cloud Transport Management integration. For more information about Quality Gate Management with SAP Solution Manager, see [Quality Gate Management](#).

The following graphic provides an overview about the interplay between continuous integration, SAP Cloud Transport Management, and Quality Gate Management:



The interplay comprises the following steps:

- As a result of the continuous integration build, a [multitarget application \(MTA\)](#) is created, uploaded to SAP Cloud Transport Management, and attached to a new transport request in the import queue of the PRE-PROD node.
- The Transport Management transport requests are visible in SAP Solution Manager.
- The developer assigns the request to a change document.
- The developer approves the change document, which in the transport management service, triggers the import of the MTA into the PRE-PROD node.
- Through the import, the deployment of the MTA to the PRE-PROD subaccount is triggered.

6. At the same time, the import forwards the transport request with the MTA to the PROD import queue in SAP Cloud Transport Management.
7. This transport is also reflected in SAP Solution Manager, where the change document is transported to the PROD requests.
8. The change manager approves the change document for production, which in the transport management service, triggers the import of the MTA into the PROD node.
9. The import triggers the deployment of the MTA to the PROD subaccount.

## Prerequisites

- You have enhanced your CI/CD pipeline with SAP Cloud Transport Management, as described in [Integrate SAP Cloud Transport Management into Your CI/CD Pipeline \[page 30\]](#).
- You have access to an SAP Solution Manager system in version 7.2 SP10 or higher.

## Procedure

1. From Setting up [SAP BTP TMS for Change Control Management](#), execute the tasks in the following sections:
  - Set-up Steps in the Change Control Management
  - Set-up Steps in the Landscape Management Database (LMDB)
  - Set-up Steps in the Solution Administration (SLAN)
2. To prevent manual imports into the nodes that you want to be controlled by Quality Gate Management, set the flag [Controlled by SAP Solution Manager](#) in their configurations in SAP Cloud Transport Management.

## Result

SAP Cloud Transport Management is now visible in the landscape view of SAP Solution Manager. If you use your continuous delivery pipeline to upload an MTA (or another content archive) to the transport management service, the content is now attached to the import queue of the first node that is controlled by SAP Cloud Transport Management.

In SAP Solution Manager, you can now search for transport requests that are waiting in the import queue and assign them to the correct change request in the change control management. Whenever in a change request, the change reaches an appropriate state (for example, [To be tested](#)), you can trigger its import into the node.

## 2.5.2 Integrate Change Request Management with SAP Solution Manager into Your CI/CD Pipeline

Add change management processes that are compliant with the Information Technology Infrastructure Library (ITIL) to your CI/CD pipeline and facilitate the synchronization of changes made both on-premise and on SAP BTP.

### → Tip

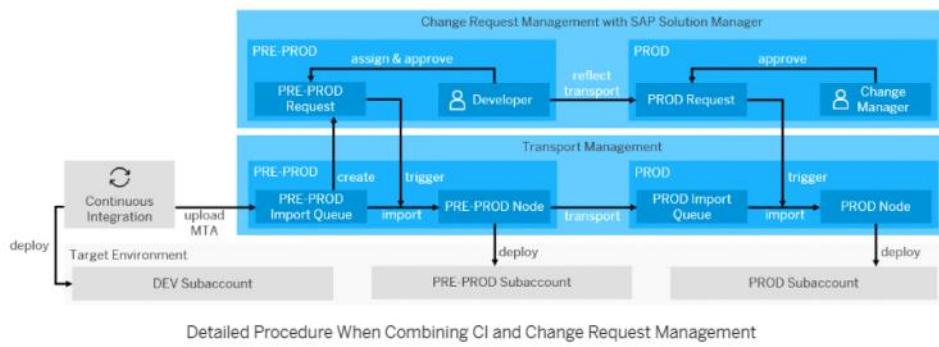
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This scenario explains how to add Change Request Management to your CI/CD pipeline with an SAP Cloud Transport Management integration. For more information about Change Request Management with SAP Solution Manager, see [Change Request Management](#).

The following graphic provides an overview about the interplay between continuous integration, SAP Cloud Transport Management, and Change Request Management:



The interplay comprises the following steps:

- As a result of the continuous integration build, a **multitarget application (MTA)** is created, uploaded to SAP Cloud Transport Management, and attached to a new transport request in the import queue of the PRE-PROD node.
- The Transport Management transport requests are visible in SAP Solution Manager.
- The developer assigns the request to a change document.
- The developer approves the change document, which in the transport management service, triggers the import of the MTA into the PRE-PROD node.
- Through the import, the deployment of the MTA to the PRE-PROD subaccount is triggered.

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- You have configured Change Request Management with SAP Solution Manager, as described in [Configuring Change Request Management](#).

## Procedure

1. From Setting up [SAP BTP TMS for Change Control Management](#), execute the tasks in the following sections:
  - Set-up Steps in the Change Control Management
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## Result

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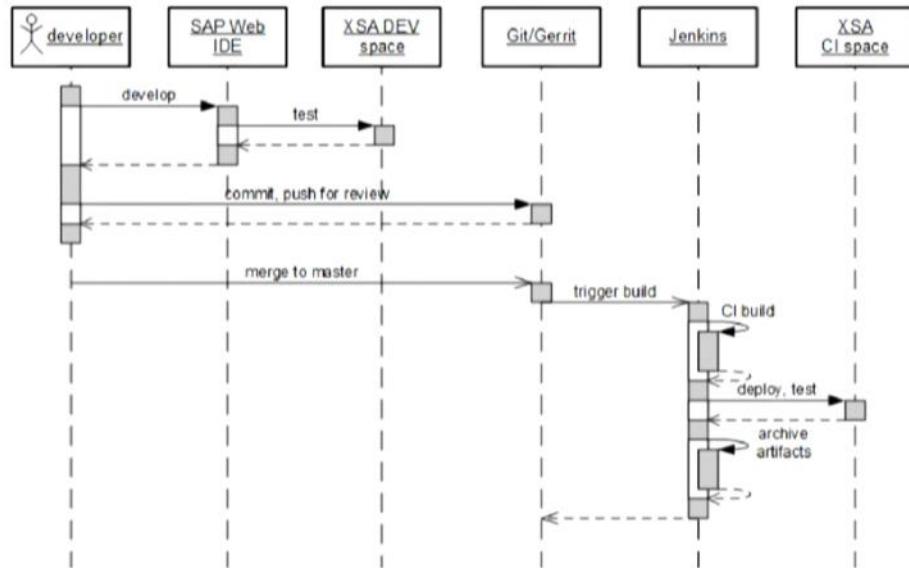
# dat 300 continuous integration for sap hana database deployment

Tuesday, October 4, 2022 8:35 PM

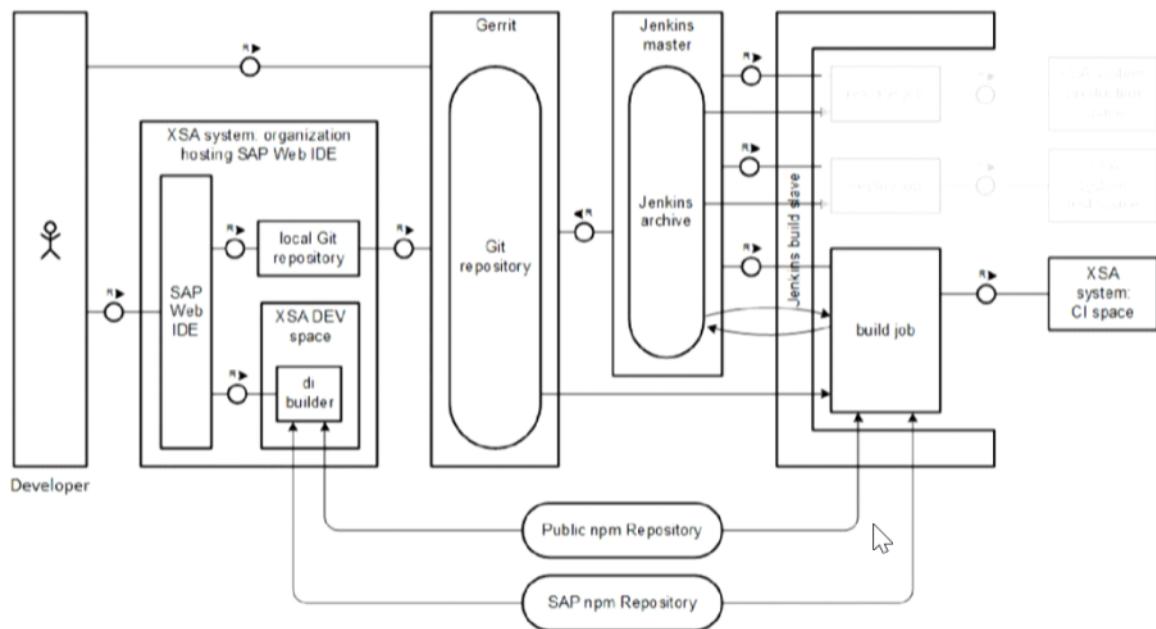
<https://events.sap.com/teched/en/embed.aspx?sid=41182>

dat 300 continuous integration for sap hana database deployment

## CI Process for XSA

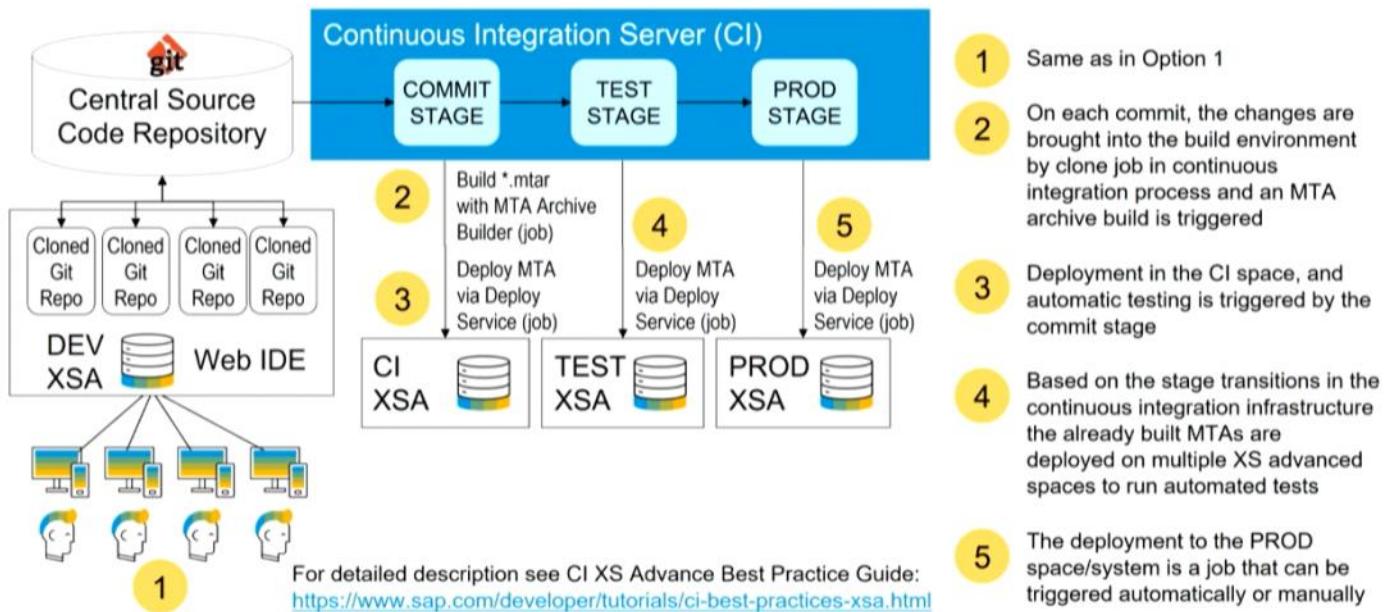


## CI Process Landscape for XSA



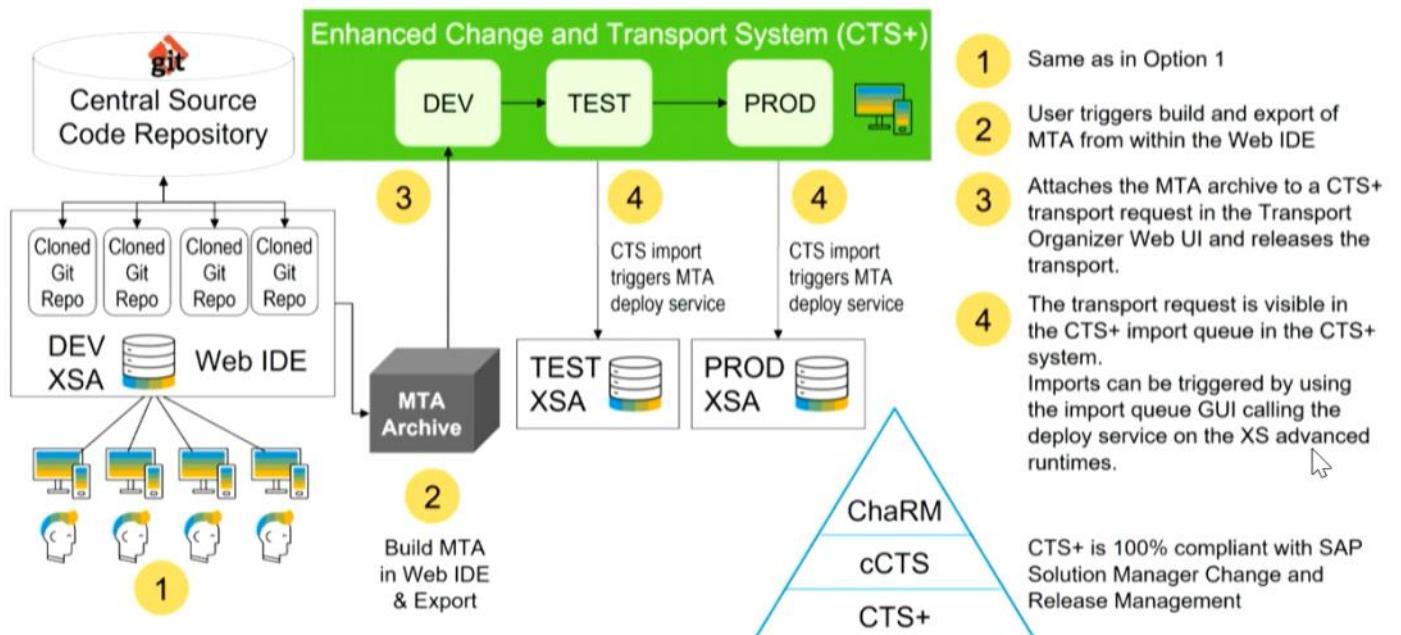
## Application Lifecycle Management

Option 2: continuous integration process



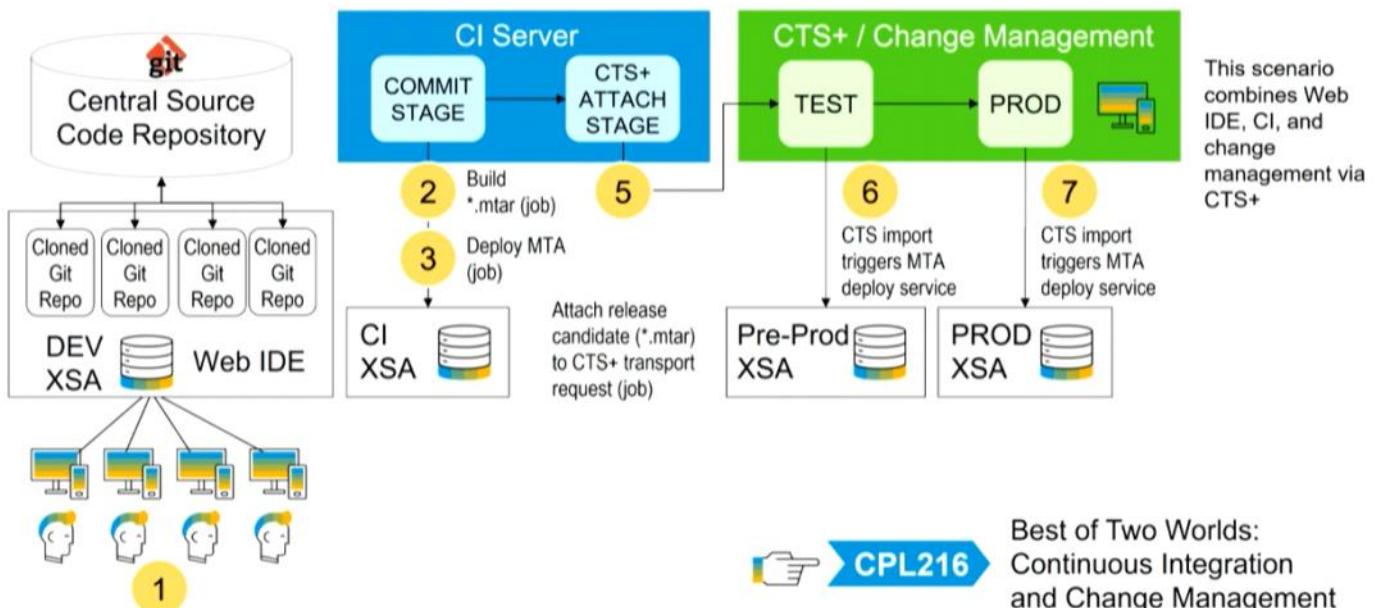
## Application Lifecycle Management

Option 3: CTS+ integration



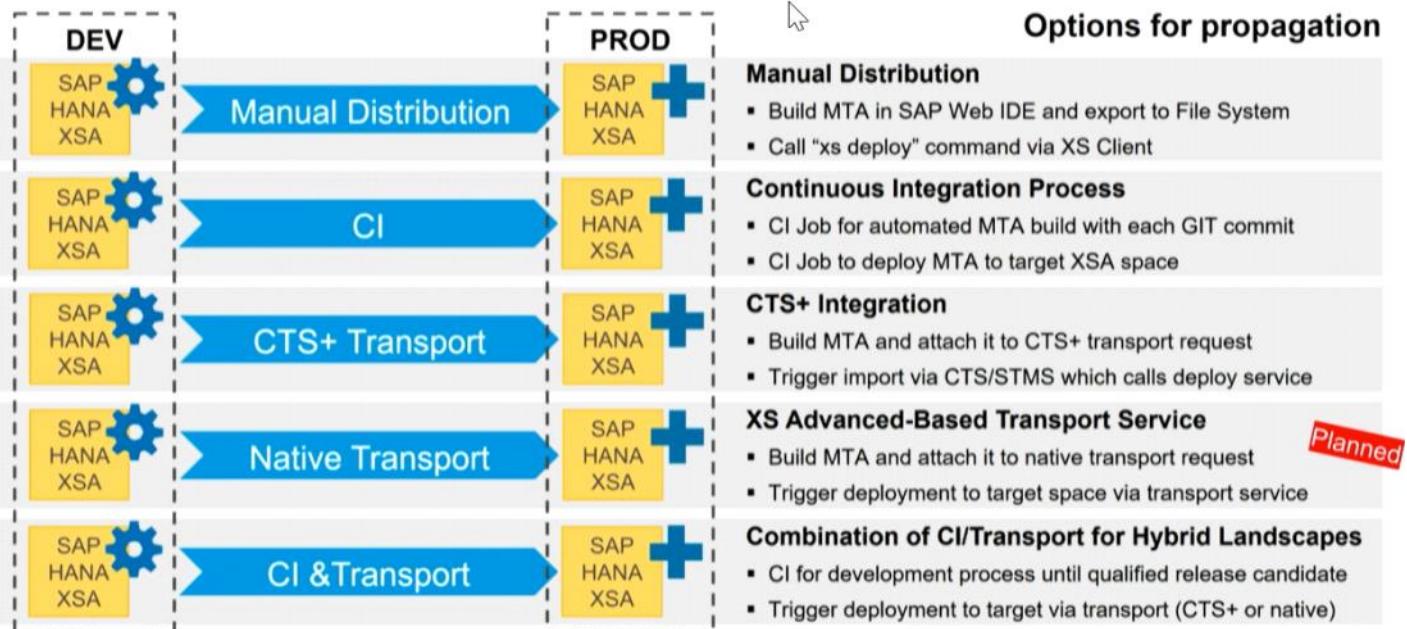
# Application Lifecycle Management

Option 4: CI and change management



## Application Lifecycle Management

Development to production processes for SAP HANA XS advanced content



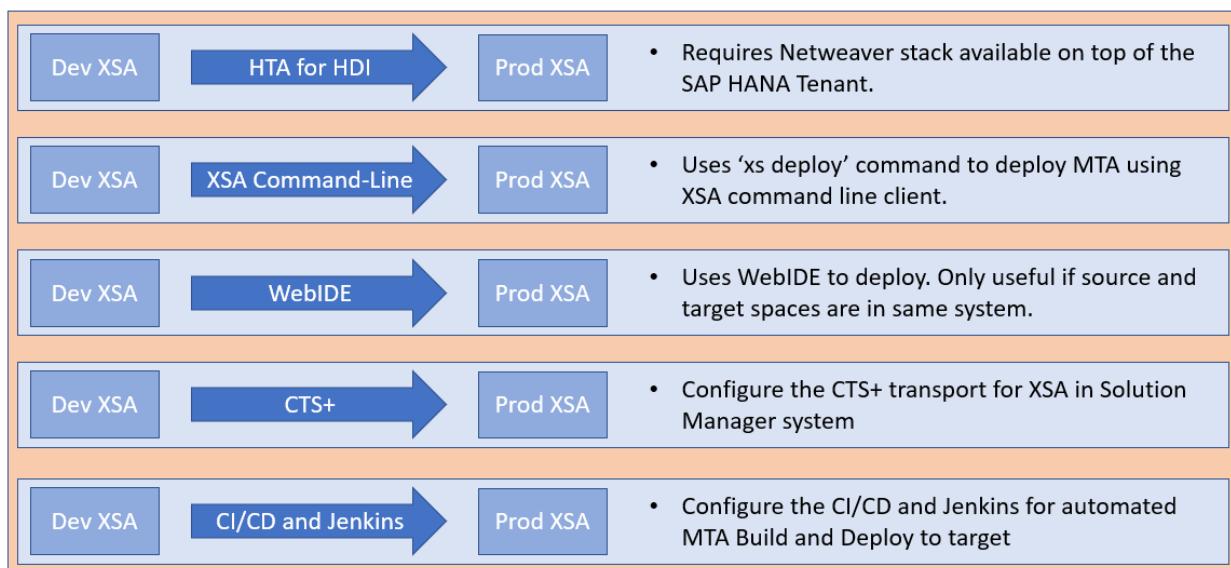
# HANA XSA Simplified 5: Deployment options for XSA MTA projects | SAP Blogs

Tuesday, October 4, 2022 8:55 PM

Clipped from: <https://blogs.sap.com/2020/08/23/hana-xsa-simplified-5-deployment-options-for-xsa-mta-projects/>

In this blog post; I will explain the different options available for the deployment process in HANA XSA. In my earlier blog post [HANA XSA Simplified 3: Using GIT as a central repository in WebIDE and Deploy Process](#); I have already explained in detail how Git can be used as a central repository and how we can align the deployment process with it. In this blog post we will see what options are available to perform the Deployment of XSA project from Development to Quality and Production environment.

To deploy the XSA MTA projects to target spaces mainly below 5 options are available. SAP is also working on the 6<sup>th</sup> option for XS Advanced Based Transport Service. It will support to attach MTA to native transport request and deploy it to target space via transport service. But we do not have any clarity when this option will be available.



## Deploy options in HANA XSA

To perform the deployment, user need to have the 'Space Developer' authorization on target space.

1. **ABAP Transport (HTA for HDI):** If there is a Netweaver stack available on top of the SAP HANA XSA tenant and if both ABAP and Native development are done, then you can use "HTA for HDI" to transport both HDI and ABAP development artefacts together using ABAP transports from Netweaver layer. The transaction `SCTS_HTA_TOOLS` provide links to many programs and documentation that you might find helpful when using HTA for HDI. Please use the SAP Note [2569651](#) – Configure your ABAP Development System for

Development of HDI Objects. It explains how to configure SAP HANA Transport for ABAP for SAP HANA Deployment Infrastructure (HTA for HDI) and provides a detailed guide.

2. **XS Advanced Command-Line Client:** In this method; developer can perform the deployment if he has XS Advanced Command-Line Client available on his desktop and he has authorizations to use it. To know more about how to access and use the XS Advanced Command-Line Client; use the below link.

<https://help.sap.com/viewer/400066065a1b46cf91df0ab436404ddc/2.0.05/en-US/1307bc5dbb844146b0cf4594b39fc3db.html>

Once .mtar file is ready to deploy in webide then download it to your local desktop in the bin folder of XS Advanced Command-Line Client. Let us consider the .mtar file name is 'proj\_deploy.mtar'.

Open the XS Advanced Command-Line Client and login to the Target system using XSA user ID and password. Navigate to target organization and space using command 'xs t -o 'organization' -s 'prod\_space'. Then use the command 'xs deploy proj\_deploy.mtar' to deploy the .mtar file to target space.

3. **Using WebIDE:** This option is useful only if source and target space is available in the same system. Once .mtar file is ready to deploy in webide right click on the .mtar file, in context menu there is an option 'Deploy'. Click on that choose the target Organization and space and click on Deploy.
4. **Using CTS+:** In this option CTS+ functionality of solution manager system is used for the transports of .mtar files. Please refer the below document which describes end to end method on how to configure the CTS+ for HANA XSA and how to transport the .mtar file using the CTS+ transport request.

<https://www.sap.com/documents/2016/12/98ccd65a-9c7c-0010-82c7-eda71af511fa.html>

If you are using multiple spaces in your project, then to differentiate between the different spaces create individual Application type for each Space. Once the CTS+ configuration for XSA is completed then MTA can be attached to CTS+ transport request in the Transport Organizer Web UI and releases the transport. Imports can be triggered by using the import queue GUI calling the deploy service on the XS advanced.

5. **Using CI/CD in Git or Jenkins:** This method uses the CI/CD pipelines available in Git. It uses the commits performed on the branch of Git to build environment by clone job in continuous integration process and MTA build is triggered. Test stage automatically triggers the deployment of MTA on the Test environment spaces to run automated tests. Finally, the deployment to the Production space is a job that can be triggered automatically or manually. Please find below the detail guide on how to configure the CI/CD for XSA MTA automated transports.

<https://help.sap.com/viewer/3324745951b44b578bd65221d2ff8f9a/CLOUD/en-US/55242ddaa08d4f3190fd06171b5f85f5.html>

<https://sap.github.io/jenkins-library/scenarios/changeManagement/>

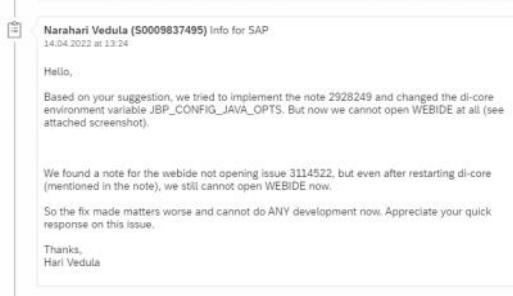
Hope, this blog post will help you to take right decisions to choose which deployment method to use for your HANA XSA project.

# HANA XSA reinstall

Friday, October 7, 2022 7:01 AM

- Proxy Settings for GIT  
Jesus has the related information
- Recreate User provided services
- Code Backup to GIT
- User and Roles backup
  - User and corresponding roles
  - Roles
    - Standard
    - Basis created custom roles
    - Application custom roles
- WebIDE set up ( if any additional set up is required)
- QA2 workspace set up
- Rebuild and deploy all apps again

GITHub set up:-



The screenshot shows the SAP HANA XS Advanced Cockpit interface. On the left, there's a sidebar with navigation links: Overview, Service Bindings, Security, Roles, Scopes, Attributes, Role Templates, **User-Provided Variables** (which is highlighted with a red box), and Environment Variables. The main content area shows the 'Application: di-core - User-Provided Variables' page. At the top, there are navigation tabs for Home, SAP, and di-core. Below that, there's a table with two columns: Key and Value. The table contains the following data:

| Key                         | Value                                                                                                                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| apps_npm_registry_url       | https://sapuxhbd.tcc.etn.com:51024                                                                                                                                                                   |
| auditlog_service_name       | devx-auditlog                                                                                                                                                                                        |
| BUILDER_MAX_EXECUTION_TIME  | 300                                                                                                                                                                                                  |
| hdi_service_name            | di-core-hdi                                                                                                                                                                                          |
| <b>JBP_CONFIG_JAVA_OPTS</b> | [java_opts: "-Dhttp.proxyHost=proxy.etn.com -Dhttp.proxyPort=8080 -Dhttps.proxyHost=proxy.etn.com -Dhttps.proxyPort=8080 -Dhttp.nonProxyHosts=\"localhost 127.0.0.1 tcc.etn.com etn.com .ci.root\""] |

# Workspaces

Friday, October 14, 2022 2:36 PM

## 1) Project Center

SalesOrderAPI  
TinyWorld\_4

- 2) Test Workspace
- 3) Supplier Portal
- 4) BOM
- 5) ChatBot
- 6)

# Users

Sunday, October 16, 2022 6:25 AM

|          |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E0380374 | Sanjay Motwani | <a href="#">Z_WEBIDE_DEVELOPMENT</a> ,<br><a href="#">ZDEVWEBIDE</a> ,<br><a href="#">ZADMINWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_USER_ADMIN</a> ,<br><a href="#">XS_TENANT_DISPLAY</a> ,<br><a href="#">XS_TENANT_ADMIN</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> ,<br><a href="#">XS_SUBSCRIPTION_ADMIN</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> ,<br><a href="#">XS_CONTROLLER_USER</a> ,<br><a href="#">XS_CONTROLLER_GLOBAL_AUDITOR</a> ,<br><a href="#">XS_CONTROLLER_CREDENTIALS_VIEWER</a> ,<br><a href="#">XS_CONTROLLER_AUDITOR</a> ,<br><a href="#">XS_CONTROLLER_ADMIN_READ_ONLY</a> ,<br><a href="#">XS_CONTROLLER_ADMIN</a> ,<br><a href="#">XS_AUTHORIZATION_DISPLAY</a> ,<br><a href="#">XS_AUTHORIZATION_ADMIN</a> ,<br><a href="#">COCKPIT_USER_ADMIN</a> ,<br><a href="#">COCKPIT_USER</a> ,<br><a href="#">COCKPIT_TROUBLESHOOTING</a> ,<br><a href="#">COCKPIT_RESOURCE_ADMIN</a> ,<br><a href="#">COCKPIT_POWER_USER</a> ,<br><a href="#">COCKPIT_CONFIG_TEMPLATE_ADMIN</a> ,<br><a href="#">COCKPIT_ADMIN</a> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|          |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E0509527 | Akshay Nalange | <a href="#">Test_ODATAV4</a> ,<br><a href="#">XS_TENANT_ADMIN</a> ,<br><a href="#">Z_WEBIDE_DEVELOPMENT</a> ,<br><a href="#">ZDEVWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> ,<br><a href="#">XS_CONTROLLER_USER</a> ,<br><a href="#">XS_CONTROLLER_ADMIN_READ_ONLY</a> ,<br><a href="#">XS_CONTROLLER_ADMIN</a> ,<br><a href="#">XS_AUTHORIZATION_DISPLAY</a> ,<br><a href="#">TrippLiteSupplierPortal</a> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|          |            |                                                                                                                                                                                                                                                                          |
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| E0524995 | Chris Lore | <a href="#">Z_WEBIDE_DEVELOPMENT</a> ,<br><a href="#">ZDEVWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_TENANT_DISPLAY</a> ,<br><a href="#">XS_TENANT_ADMIN</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> , |
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|  |  | <a href="#">XS_SUBSCRIPTION_ADMIN</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> ,<br><a href="#">XS_CONTROLLER_USER</a> ,<br><a href="#">XS_CONTROLLER_ADMIN_READ_ONLY</a> ,<br><a href="#">XS_CONTROLLER_ADMIN</a> ,<br><a href="#">XS_AUTHORIZATION_DISPLAY</a> ,<br><a href="#">COCKPIT_USER</a> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

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| E0647383 | Rohit Bisht | <a href="#">Z_WEBIDE_DEVELOPMENT</a> ,<br><a href="#">ZDEVWEBIDE</a> ,<br><a href="#">ZADMINWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_USER_ADMIN</a> ,<br><a href="#">XS_TENANT_DISPLAY</a> ,<br><a href="#">XS_TENANT_ADMIN</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> ,<br><a href="#">XS_SUBSCRIPTION_ADMIN</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> ,<br><a href="#">XS_CONTROLLER_USER</a> ,<br><a href="#">XS_CONTROLLER_GLOBAL_AUDITOR</a> ,<br><a href="#">XS_CONTROLLER_CREDENTIALS_VIEWER</a> ,<br><a href="#">XS_CONTROLLER_AUDITOR</a> ,<br><a href="#">XS_CONTROLLER_ADMIN_READ_ONLY</a> ,<br><a href="#">XS_CONTROLLER_ADMIN</a> ,<br><a href="#">XS_AUTHORIZATION_DISPLAY</a> ,<br><a href="#">XS_AUTHORIZATION_ADMIN</a> ,<br><a href="#">TrippLiteSupplierPortal</a> ,<br><a href="#">Test_ODATAV4</a> ,<br><a href="#">COCKPIT_USER_ADMIN</a> ,<br><a href="#">COCKPIT_USER</a> ,<br><a href="#">COCKPIT_TROUBLESHOOTING</a> ,<br><a href="#">COCKPIT_RESOURCE_ADMIN</a> ,<br><a href="#">COCKPIT_POWER_USER</a> ,<br><a href="#">COCKPIT_CONFIG_TEMPLATE_ADMIN</a> ,<br><a href="#">COCKPIT_ADMIN</a> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|          |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E9811861 | Hari Veduala | <a href="#">Z_WEBIDE_DEVELOPMENT</a> ,<br><a href="#">ZSALES_ORDER_API</a> ,<br><a href="#">ZDEVWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_TENANT_DISPLAY</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> ,<br><a href="#">XS_CONTROLLER_USER</a> ,<br><a href="#">XS_CONTROLLER_ADMIN_READ_ONLY</a> ,<br><a href="#">XS_CONTROLLER_ADMIN</a> ,<br><a href="#">XS_AUTHORIZATION_DISPLAY</a> ,<br><a href="#">TrippLiteSupplierPortal</a> ,<br><a href="#">Test_ODATAV4</a> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

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| E9812036 | Venkatesh Krishnan | <a href="#">ZDEVWEBIDE</a> ,<br><a href="#">ZADMINWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_USER_ADMIN</a> ,<br><a href="#">XS_TENANT_DISPLAY</a> ,<br><a href="#">XS_TENANT_ADMIN</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> ,<br><a href="#">XS_SUBSCRIPTION_ADMIN</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> ,<br><a href="#">XS_CONTROLLER_USER</a> ,<br><a href="#">XS_CONTROLLER_GLOBAL_AUDITOR</a> ,<br><a href="#">XS_CONTROLLER_CREDENTIALS_VIEWER</a> ,<br><a href="#">XS_CONTROLLER_AUDITOR</a> ,<br><a href="#">XS_CONTROLLER_ADMIN_READ_ONLY</a> ,<br><a href="#">XS_CONTROLLER_ADMIN</a> ,<br><a href="#">XS_AUTHORIZATION_DISPLAY</a> ,<br><a href="#">XS_AUTHORIZATION_ADMIN</a> ,<br><a href="#">COCKPIT_USER_ADMIN</a> ,<br><a href="#">COCKPIT_USER</a> ,<br><a href="#">COCKPIT_TROUBLESHOOTING</a> ,<br><a href="#">COCKPIT_RESOURCE_ADMIN</a> ,<br><a href="#">COCKPIT_POWER_USER</a> ,<br><a href="#">COCKPIT_CONFIG_TEMPLATE_ADMIN</a> ,<br><a href="#">COCKPIT_ADMIN</a> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

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| E9815840 | Nilesh Kumar | <a href="#">COCKPIT_ADMIN</a> ,<br><a href="#">XS_CONTROLLER_ADMIN_READ_ONLY</a> ,<br><a href="#">Z_WEBIDE_DEVELOPMENT</a> ,<br><a href="#">ZDEVWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_TENANT_DISPLAY</a> ,<br><a href="#">XS_TENANT_ADMIN</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> ,<br><a href="#">XS_AUTHORIZATION_DISPLAY</a> ,<br><a href="#">COCKPIT_USER</a> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

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| E9817762 | Jesus Torres Lara | <a href="#">Z_WEBIDE_DEVELOPMENT</a> ,<br><a href="#">ZDEVWEBIDE</a> ,<br><a href="#">ZADMINWEBIDE</a> ,<br><a href="#">XS_USER_PUBLIC</a> ,<br><a href="#">XS_USER_DISPLAY</a> ,<br><a href="#">XS_USER_ADMIN</a> ,<br><a href="#">XS_TENANT_DISPLAY</a> ,<br><a href="#">XS_TENANT_ADMIN</a> ,<br><a href="#">XS_SUBSCRIPTION_DISPLAY</a> ,<br><a href="#">XS_SUBSCRIPTION_ADMIN</a> ,<br><a href="#">XS_MONITOR_DISPLAY</a> ,<br><a href="#">XS_MONITOR_ADMIN</a> |
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|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <u>XS_CONTROLLER_USER</u> ,<br><u>XS_CONTROLLER_GLOBAL_AUDITOR</u> ,<br><u>XS_CONTROLLER_CREDENTIALS_VIEWER</u> ,<br><u>XS_CONTROLLER_AUDITOR</u> ,<br><u>XS_CONTROLLER_ADMIN_READ_ONLY</u> ,<br><u>XS_CONTROLLER_ADMIN</u> ,<br><u>XS_AUTHORIZATION_DISPLAY</u> ,<br><u>XS_AUTHORIZATION_ADMIN</u> ,<br><u>COCKPIT_USER_ADMIN</u> ,<br><u>COCKPIT_USER</u> ,<br><u>COCKPIT_TROUBLESHOOTING</u> ,<br><u>COCKPIT_RESOURCE_ADMIN</u> ,<br><u>COCKPIT_POWER_USER</u> ,<br><u>COCKPIT_CONFIG_TEMPLATE_ADMIN</u> ,<br><u>COCKPIT_ADMIN</u> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|          |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| E9929790 | Wasim Shaikh | <u>Z_WEBIDE_DEVELOPMENT</u> ,<br><u>ZDEVWEBIDE</u> ,<br><u>XS_USER_PUBLIC</u> ,<br><u>XS_USER_DISPLAY</u> ,<br><u>XS_TENANT_ADMIN</u> ,<br><u>XS_SUBSCRIPTION_ADMIN</u> ,<br><u>XS_MONITOR_DISPLAY</u> ,<br><u>XS_MONITOR_ADMIN</u> ,<br><u>XS_CONTROLLER_USER</u> ,<br><u>XS_CONTROLLER_ADMIN_READ_ONLY</u> ,<br><u>XS_CONTROLLER_ADMIN</u> ,<br><u>XS_AUTHORIZATION_DISPLAY</u> ,<br><u>TrippLiteSupplierPortal</u> ,<br><u>Test_ODATAV4</u> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|                |                                                    |
|----------------|----------------------------------------------------|
| PROJECT_CENTER | <u>ZSALES_ORDER_API</u> ,<br><u>XS_USER_PUBLIC</u> |
|----------------|----------------------------------------------------|

From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|                 |                                                           |
|-----------------|-----------------------------------------------------------|
| TRIP_SUP_PORTAL | <u>XS_USER_PUBLIC</u> ,<br><u>TrippLiteSupplierPortal</u> |
|-----------------|-----------------------------------------------------------|

From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|           |                                                                                                                                                                                                                                                                                                                              |
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| XSA_ADMIN | <u>COCKPIT_ADMIN</u> ,<br><u>ZADMINWEBIDE</u> ,<br><u>XS_USER_PUBLIC</u> ,<br><u>XS_USER_DISPLAY</u> ,<br><u>XS_USER_ADMIN</u> ,<br><u>XS_MONITOR_ADMIN</u> ,<br><u>XS_CONTROLLER_ADMIN</u> ,<br><u>XS_AUTHORIZATION_ADMIN</u> ,<br><u>COCKPIT_USER_ADMIN</u> ,<br><u>COCKPIT_USER</u> ,<br><u>COCKPIT_TROUBLESHOOTING</u> , |
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|  |                                                                         |
|--|-------------------------------------------------------------------------|
|  | <u>COCKPIT_RESOURCE_ADMIN</u> ,<br><u>COCKPIT_CONFIG_TEMPLATE_ADMIN</u> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|               |                                                                                                                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XX_SUP_PC_API | <u>ZSALES_ORDER_API</u> ,<br><u>XS_USER_PUBLIC</u> ,<br><u>XS_USER_DISPLAY</u> ,<br><u>XS_TENANT_DISPLAY</u> ,<br><u>XS_SUBSCRIPTION_DISPLAY</u> ,<br><u>XS_MONITOR_DISPLAY</u> ,<br><u>XS_CONTROLLER_ADMIN_READ_ONLY</u> ,<br><u>XS_AUTHORIZATION_DISPLAY</u> ,<br><u>COCKPIT_TROUBLESHOOTING</u> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

|                |                                                                                                                                                                                                                                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XX_SUP_SLT_API | <u>XS_USER_PUBLIC</u> ,<br><u>XS_USER_DISPLAY</u> ,<br><u>XS_TENANT_DISPLAY</u> ,<br><u>XS_MONITOR_DISPLAY</u> ,<br><u>XS_CONTROLLER_ADMIN_READ_ONLY</u> ,<br><u>XS_AUTHORIZATION_DISPLAY</u> ,<br><u>TrippLiteSupplierPortal</u> |
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From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/membermanagement>>

## Custom roles

Sunday, October 16, 2022 6:28 AM

### TrippLiteSupplierPortal

|  |                    |                |                |
|--|--------------------|----------------|----------------|
|  | Supplier_portal!i3 | Token_Exchange | Token_Exchange |
|  | Supplier_portal!i3 | Viewer         | Viewer         |
|  | Supplier_portal!i4 | Token_Exchange | Token_Exchange |
|  | Supplier_portal!i4 | Viewer         | Viewer         |

### ZSALES\_ORDER\_API

| Application Identifier | Role Name                                              | Role Template          | Actions                |
|------------------------|--------------------------------------------------------|------------------------|------------------------|
|                        | salesOrderAPI!i3                                       | GenericODataAccessRole | GenericODataAccessRole |
|                        | salesOrderAPI!i4                                       | GenericODataAccessRole | GenericODataAccessRole |
|                        | salesOrderAPI!i4                                       | Token_Exchange         | Token_Exchange         |
|                        | salesOrderAPI!i4                                       | Viewer                 | Viewer                 |
|                        | salesOrderAPI!d65c5889-8a7f-4031-aa65-dcd783875a6cl!i3 | Token_Exchange         | Token_Exchange         |
|                        | salesOrderAPI!d65c5889-8a7f-4031-aa65-dcd783875a6cl!i3 | Viewer                 | Viewer                 |

From <[https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/ZSALES\\_ORDER\\_API/rolecollectionOverview](https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/ZSALES_ORDER_API/rolecollectionOverview)>

|                    |     |  |
|--------------------|-----|--|
| salesOrderAPI!i2   | Dev |  |
| Supplier_portal!i2 | Dev |  |

[Home](#) /  
[Test\\_ODATAV4](#)

Role Collection: Test\_ODATAV4 - Roles

All: 1  
[Add Role](#)

| Application Identifier | Role Name              | Role Template          | Actions |
|------------------------|------------------------|------------------------|---------|
| ODATAV4Example1!i3     | GenericODataAccessRole | GenericODataAccessRole |         |

From <[https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/Test\\_ODATAV4/rolecollectionOverview](https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/Test_ODATAV4/rolecollectionOverview)>

[Home](#) /  
[Z\\_WEBIDE\\_DEVELOPMENT](#)

Role Collection: Z\_WEBIDE\_DEVELOPMENT - Roles

All: 1

[Add Role](#)

| Application Identifier | Role Name        | Role Template    | Actions |
|------------------------|------------------|------------------|---------|
| webide!1               | WebIDE_Developer | WebIDE_Developer |         |

From <[https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/Z\\_WEBIDE\\_DEVELOPMENT/rolecollectionOverview](https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/Z_WEBIDE_DEVELOPMENT/rolecollectionOverview)>

[Home](#) /  
[ZDEVWEBIDE](#)

Role Collection: ZDEVWEBIDE - Roles

All: 1

[Add Role](#)

| Application Identifier | Role Name        | Role Template    | Actions |
|------------------------|------------------|------------------|---------|
| webide!1               | WebIDE_Developer | WebIDE_Developer |         |

From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/ZDEVWEBIDE/rolecollectionOverview>>

[Home](#) /  
[ZADMINWEBIDE](#)

Role Collection: ZADMINWEBIDE - Roles

All: 1

[Add Role](#)

| Application Identifier | Role Name            | Role Template        | Actions |
|------------------------|----------------------|----------------------|---------|
| webide!1               | WebIDE_Administrator | WebIDE_Administrator |         |

From <<https://sapuxhbd.tcc.etn.com:51047/cockpit#/xsa/rolecollection/ZADMINWEBIDE/rolecollectionOverview>>

[9:47 AM] Vedula, Hari

E9811861 [XS\\_USER\\_DISPLAY](#),  
[Z\\_WEBIDE\\_DEVELOPMENT](#),  
[ZSALES\\_ORDER\\_API](#),  
[ZDEVWEBIDE](#),  
[XS\\_USER\\_PUBLIC](#),  
[XS\\_TENANT\\_DISPLAY](#),  
[XS\\_SUBSCRIPTION\\_DISPLAY](#),  
[XS\\_MONITOR\\_DISPLAY](#),  
[XS\\_MONITOR\\_ADMIN](#),  
[XS\\_CONTROLLER\\_ADMIN\\_READ\\_ONLY](#),  
[XS\\_CONTROLLER\\_ADMIN](#),  
[XS\\_AUTHORIZATION\\_DISPLAY](#),  
[WEBIDE DEVELOPER ROLE](#),  
[TrippLiteSupplierPortal](#),  
[Test\\_ODATAV4](#)

[9:47 AM] Vedula, Hari

C3062045 [Z\\_WEBIDE\\_DEVELOPMENT](#),  
[ZSALES\\_ORDER\\_API](#),  
[ZDEVWEBIDE](#),  
[XS\\_USER\\_PUBLIC](#),  
[XS\\_USER\\_DISPLAY](#),  
[XS\\_TENANT\\_DISPLAY](#),  
[XS\\_SUBSCRIPTION\\_DISPLAY](#),  
[XS\\_MONITOR\\_DISPLAY](#),  
[XS\\_MONITOR\\_ADMIN](#),  
[XS\\_CONTROLLER\\_ADMIN\\_READ\\_ONLY](#),  
[XS\\_CONTROLLER\\_ADMIN](#),  
[XS\\_AUTHORIZATION\\_DISPLAY](#),  
[WEBIDE DEVELOPER ROLE](#),  
[TrippLiteSupplierPortal](#),  
[Test\\_ODATAV4](#)

## chatbot

Thursday, August 25, 2022 8:41 AM

Try It Out

GET https://eaton-nonprod-lal/invoices/[invoiceNumber]

| Query                                  | Headers | Body  | Path [1] | Code Generation | Mocking |
|----------------------------------------|---------|-------|----------|-----------------|---------|
| <input type="checkbox"/> invoiceAmount |         | Value |          |                 |         |
| <input type="checkbox"/> invoiceDate   |         | Value |          |                 |         |
| <input type="checkbox"/> poNumber      |         | Value |          |                 |         |
| <input type="checkbox"/> vendorName    |         | Value |          |                 |         |
| <input type="checkbox"/> locationSite  |         | Value |          |                 |         |
| Key                                    |         | Value |          |                 |         |

Send

[https://stoplight-prod.apps.prod.openshift.tcc.etn.com/docs/invoices/reference/Invoices.yaml\(paths/~1invoices~1%7BinvoiceNumber%7D/get](https://stoplight-prod.apps.prod.openshift.tcc.etn.com/docs/invoices/reference/Invoices.yaml(paths/~1invoices~1%7BinvoiceNumber%7D/get)

|      |                 |
|------|-----------------|
| VBAK | /BIC/AZSD_AD012 |
| VBKD | /BIC/AZSD_AD142 |
| LFA1 | /BIC/AZMD_AD012 |
| VBRK |                 |
| VBRP |                 |

BKPF  
BSID  
BSAD

**BKPF-BELNR input**

|            |                |
|------------|----------------|
| BKPF-XSNET | Invoice amount |
| BKPF-BLDAT | Invoice date   |
| Ponumber?  | ?              |
| BSIK-LIFNR | Vendor number  |
| Location?  |                |

| RBKP-RMWWR | Invoice amount |
|------------|----------------|
| RKKP-LIFNR | Vendor number  |
| LFA1-NAME1 | Vendor name    |
| RBKP-BLDAT | Invoice Date   |
| RBKP-BUKRS | Company code   |
|            |                |

invie -> delivery->order

input : **VBAK-VBELN**

invoiceAmount :- **VBRP-NETPR** / NETWR  
 invoiceDate :- **VBRK-FKDAT**  
 poNumber :- **VBKD-BSTKD**  
 VendorName :- **LFA1-LIFNR** (link from LKP)  
 locationSite :- **VBRP-WERKS**

# Dolphin transaction and table

Wednesday, August 31, 2022 3:49 PM

Dolphin transaction :  
/DOL/AP2N  
Dolphin table /DOL/AP\_T01

|                           |                             |
|---------------------------|-----------------------------|
| /DOL/AP_T01-XBLNR         | Invoice number (input)      |
| /DOL/AP_T01-BSLDT         | Invoice Date                |
| /DOL/AP_T01-BUKRS         | Company Code(Location site) |
| /DOL/AP_T01-LIFNR (NAME1) | Vendor Name                 |
| /DOL/AP_T01-EBELN         | Po Number                   |
| /DOL/AP_T01-WAERS         | Currency Key                |
| /DOL/AP_T01-WRBTR         | Amount in Document Currency |

Mapping table to go from Company code to Oracle Ledger (**ZFM\_ZFI\_ORA\_CCPC\_LGR**)

| Display View "SAP Profit Center to Oracle Ledger cross reference": Ove |            |                              |                                      |            |                                          |  |
|------------------------------------------------------------------------|------------|------------------------------|--------------------------------------|------------|------------------------------------------|--|
| SAP Code                                                               | SAP Prf Ct | SAP Company Code Description | SAP Profit Center Desc               | Ora Ledger | Oracle Ledger Description                |  |
| 1001                                                                   |            | Cooper Crouse-Hinds LLC      | 7072 C-H Amarillo Plant              | 7000       | Cooper Crouse-Hinds, LLC                 |  |
| 1001                                                                   | 1000       | Cooper Crouse-Hinds LLC      | C-H Meadow Lands Plant               | 7072       | C-H AMARILLO PLANT [1000]                |  |
| 1001                                                                   | 1001       | Cooper Crouse-Hinds LLC      | C-H Syracuse Plant                   | 7074       | C-H MEADOW LANDS PLANT [1001]            |  |
| 1001                                                                   | 1002       | Cooper Crouse-Hinds LLC      | C-H Roanoke Plant                    | 7000       | Cooper Crouse-Hinds, LLC                 |  |
| 1001                                                                   | 1003       | Cooper Crouse-Hinds LLC      | C-H Roanoke Plant                    | 7073       | C-H ROANOKE PLANT [1003]                 |  |
| 1001                                                                   | 1004       | Cooper Crouse-Hinds LLC      | C-H LaGrange Plant                   | 7533       | C-H LAGRANGE PLANT [1004]                |  |
| 1001                                                                   | 1005       | Cooper Crouse-Hinds LLC      | C-H Windsor Plant                    | 7075       | C-H WINDSOR PLANT [1005]                 |  |
| 1001                                                                   | 1006       | Cooper Crouse-Hinds LLC      | C-H Houston ICI                      | 7070       | C-H HOUSTON ICI [1006]                   |  |
| 1001                                                                   | 1007       | Cooper Crouse-Hinds LLC      | C-H West Coast Distribution Center   | 7087       | C-H WEST COAST DISTRIBUTION CENTER [100  |  |
| 1001                                                                   | 1009       | Cooper Crouse-Hinds LLC      | CCH MEDC Houston                     | 7071       | MENIVIER MEDC HOUSTON [1009]             |  |
| 1001                                                                   | 1011       | Cooper Crouse-Hinds LLC      | C-H Salem NJ                         | 7545       | C-H SALEM NJ [1011]                      |  |
| 1001                                                                   | 1013       | Cooper Crouse-Hinds LLC      | C-H Chelsea WPI                      | 7536       | C-H CHELSEA WPI [1013]                   |  |
| 1001                                                                   | 1014       | Cooper Crouse-Hinds LLC      | C-H Gardena, Ca                      | 7537       | C-H GARDENA, CA [1014]                   |  |
| 1001                                                                   | 1015       | Cooper Crouse-Hinds LLC      | C-H Moorpark, Ca                     | 7538       | C-H MOORPARK, CA [1015]                  |  |
| 1001                                                                   | 1016       | Cooper Crouse-Hinds LLC      | C-H Nogales WPI, US Plant            | 7539       | C-H NOGALES WPI, US PLANT [1016]         |  |
| 1001                                                                   | 1021       | Cooper Crouse-Hinds LLC      | C-H Norwalk ICI                      | 7088       | C-H NORWALK ICI [1021]                   |  |
| 1001                                                                   | 1027       | Cooper Crouse-Hinds LLC      | C-H Pearland, TX                     | 7089       | C-H PEARLAND, TX [1027]                  |  |
| 1001                                                                   | 1090       | Cooper Crouse-Hinds LLC      | Crouse Hinds C/O Metra               | 7573       | CROUSE HINDS C/O METRA [1090]            |  |
| 1001                                                                   | 1091       | Cooper Crouse-Hinds LLC      | Crouse Hinds C/O David Role          | 7574       | CROUSE HINDS C/O DAVID ROLE [1091]       |  |
| 1001                                                                   | 1092       | Cooper Crouse-Hinds LLC      | Crouse Hinds C/O E-Tel               | 7575       | CROUSE HINDS C/O E-TEL [1092]            |  |
| 1001                                                                   | 1093       | Cooper Crouse-Hinds LLC      | Crouse Hinds C/O Pro-Line            | 7576       | CROUSE HINDS C/O PRO-LINE [1093]         |  |
| 1001                                                                   | 1094       | Cooper Crouse-Hinds LLC      | Crouse Hinds C/O Pollart Electrical  | 7577       | CROUSE HINDS C/O POLLART ELECTRICAL [109 |  |
| 1001                                                                   | 1095       | Cooper Crouse-Hinds LLC      | Crouse Hinds C/o Callas/Kingsley     | 7578       | CROUSE HINDS C/O CALLAS/KINGSLEY [1095]  |  |
| 1001                                                                   | 1096       | Cooper Crouse-Hinds LLC      | Crouse Hinds C/O John Moore          | 7579       | CROUSE HINDS C/O JOHN MOORE [1096]       |  |
| 1001                                                                   | 1097       | Cooper Crouse-Hinds LLC      | 7378 - CCH - Youngsville, NC         | 7378       | CCH - Youngsville, NC [1097]             |  |
| 1001                                                                   | 1098       | Cooper Crouse-Hinds LLC      | 7383 - CCH - Dallas, TX              | 7383       | CCH - Dallas, TX [1098]                  |  |
| 1001                                                                   | 1099       | Cooper Crouse-Hinds LLC      | 7607 C-H AIRPORT LGT - Project Laser | 7607       | C-H AIRPORT LGT - Project Laser [1099]   |  |