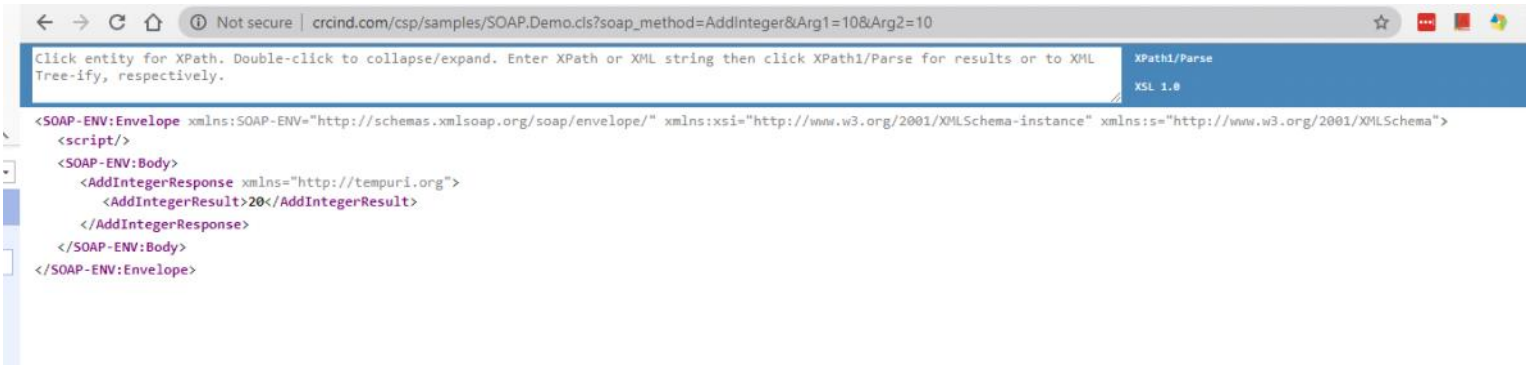
REST VS SOAP

Friday, June 19, 2020 5:53 PM

SOAP

Sample service

http://www.crcind.com/csp/samples/SOAP.Demo.cls?soap_method=AddInteger&Arg1=10&Arg2=10



How to find an API on SAP S/4HANA OP (EN) | SAP Blogs

Sunday, March 7, 2021 11:44 AM

Clipped from: https://blogs.sap.com/2020/06/11/how-to-find-an-api-on-sap-s-4hana-op-en/

Follow

RSS feed

Like

Technical Articles

Makoto Sugishita SAP

June 11, 2020 11 minute read

How to find an API on SAP S/4HANA OP (EN)

<<Japanese Version is here>>

1.Introduction

This blog is the second part of the blog series "How to extend SAP S/4HANA with SAP Cloud Platform". I will explain how to find an API for SAP S/4HANA on-premise.

1. Overview of extended development on SAP Cloud Platform
2. **How to find SAP S/4HANA API <<<< HERE**
3. How to use SAP S/4HANA API
4. when API does not exist
5. Event Integration with SAP S/4HANA

As mentioned in the previous blog , there are two types of S/4HANA Extensions: In-App extensibility and Side-by-Side extensibility. In the case of Side by Side Extensiblity, an application developed with Java, JavaScript (Node.js), Python, etc. runs on SAP Cloud Platform, and connects to S/4HANA via API (Application Programming Interface). Therefore, it is necessary to find out what kind of API exists in SAP S/4HANA and how to use it.

2. The types of SAP S/4HANA API

Currently the most common and latest APIs of SAP S/4HANA are based on OData or SOAP. Let's look at the characteristics of each API type one by one.

OData is a standard REST-based protocol and is officially called Open Data Protocol. Previously promoted mainly by Microsoft, it became the OASIS standard in 2014. Most APIs of SAP S/4HANA as of now are based on OData V2. Since it is a REST protocol, CRUD (Create, Read, Update, Delete) of each OData API supports HTTP POST, GET, PUT/PATCH, DELETE, while some Odata APIs are only for read-only. Most of the latest S/4HANA APIs are OData

Assigned tags

SAP S/4HANA

SAP API Business Hub

#s4hana

Related Blog Posts

SAP S/4HANA, on-premise edition – Transition Paths
By Former Member , Jun 04, 2016

Integrate your SAP S/4HANA with Salesforce via SAP Cloud Platform Integration
By **Mert Turan** , Mar 12, 2020

Introduction to Extracting Data from SAP S/4HANA with ABAP CDS Views Webcast Recap
By **Tammy Powlas** , May 04, 2020

Related Questions

How do we find out underlying S/4 HANA table for an API?
By **Priya Kulkarni** , Jan 28, 2021

Key user extensibility - add a column in Purchase Orders Items table
By **Sumit Kumar Kundu** , Dec 05, 2019

S/4 HANA - S&OP
By **Flavio Molina** , Oct 31, 2017

V2. Since it is a REST protocol, CRUD (Create, Read, Update, Delete) of each OData API supports HTTP POST, GET, PUT/PATCH, DELETE, while some Odata APIs are only for read-only. Most of the latest S/4HANA APIs are OData based ones, so it's a good idea to look for OData APIs first.

SOAP is a Web Service protocol that was popular in the 2000s and is still used today. Once it was heavily used as a core technology of SOA (Service Oriented Architecture), and there are many SOAP-based APIs in S/4HANA. It is the same as OData in that it is based on HTTPS, but it is necessary to have an XML container called SOAP Envelope in the HTTP Body, and to put the XML (SOAP Body) that is the content in it. In many cases, SOAP Client is generated with a metadata file called as WSDL (Web Service Description Language).

Most of the APIs existing in SAP API Business Hub introduced here are provided in OData or SOAP format.

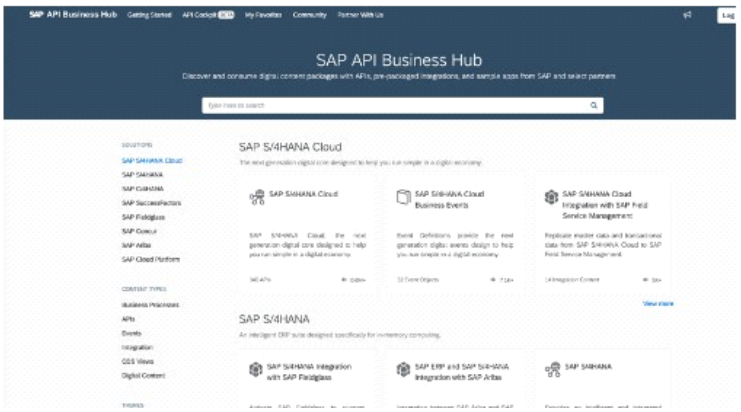
BAPIs and IDocs are the legacy APIs that have long been used since the era of SAP R/3 and SAP ECC. These are not listed in SAP API Business Hub, and it is necessary to check them in the system of each S/4HANA and/or online help.

BAPI (abbreviation of Business Application Programming Interface) is a legacy API implemented in the form of functions called SAP Function Modules. It is possible to be called from outside using SAP's own protocol called RFC (Remote Function Call). If you want to call BAPI from Java, you can use the wrapper library called as JCo (Java Connector, pronounced as Jay-co) and you can use .Net Connector (= NCo) for .Net based apps . BAPI is logically defined as a method of Business Object * (the objects such as sales order good receipts, material masters, etc. that are defined in S/4HANA such as documents and masters). ** This Business Object is not relevant to BI Tools SAP Business Objects*

IDoc is an abbreviation for Intermediate Document.
Originally, IDoc was a technology that defines an intermediate file format to support various EDI formats.Thus we have realized data exchange by converting from IDoc data formats to the ones used by business partners with external middleware or vice versa. Therefore, IDocs are still widely used in B2B scenarios such as ordering even today. IDoc technology has been gradually expanded from the conventional file-based technology, and has evolved to allow direct data export and import using RFC, SOAP, and plain HTTP. In particular, the technology that connects ABAP based SAP systems with RFC was called ALE (Application Link Enabling). Since we originally assumed a fixed-length data format, the data structure has some quirks. Nowadays it is often used in conjunction with SAP Process Integration or SAP Cloud Platform Integration because it basically requires format mapping.

3.Finding an OData API

Let's access to the SAP API Business Hub to find the information.



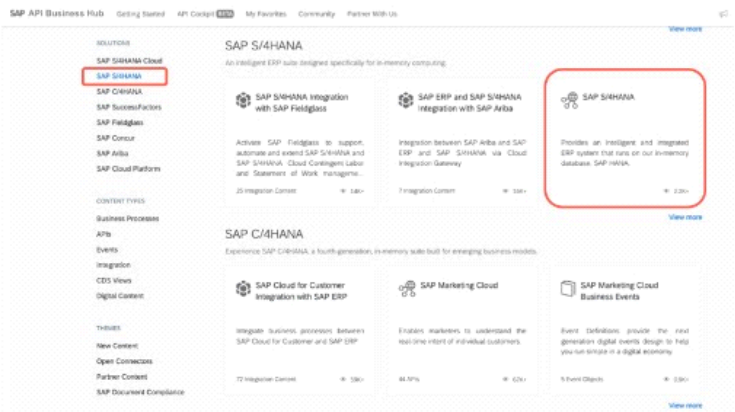
In the SAP API Business Hub, there is API information for various applications including Cloud LoB solutions such as SAP Concur and SAP SuccessFactors as well as SAP S/4HANA.

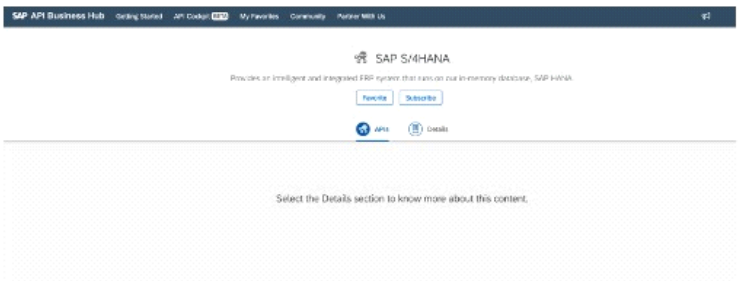
You can search API, check information, test, etc. on this site. However, SAP API Business Hub is basically developed for Cloud Solution, we only offer a limited information or functionalities for the On-Premise systems.

As an example, suppose you want to find an API that registers an order entry for SAP S/4HANA On-Premise.

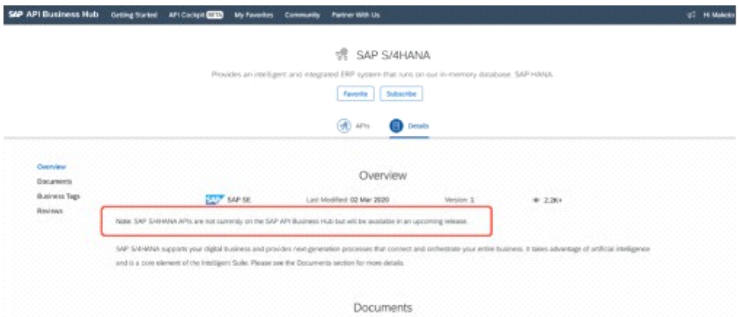
First, there is S/4HANA Cloud and S/4HANA in SOLUTIONS on the left.

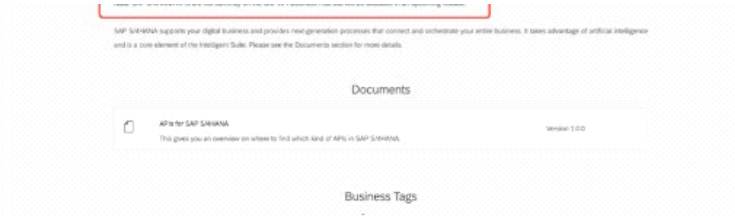
Since it is an On-Premise, I will select SAP S/4HANA for the time being.





Click the Details tab to display the screen below.





As you can see the note like below as of April 2020, the API group of SAP S/4HANA (On-Premise) is not listed in API Business Hub unfortunately.

Note: *SAP S/4HANA APIs are not currently on the SAP API Business Hub but will be available in an upcoming release.*

As of now, the PDF file called API for SAP S/4HANA is only a summary of where the API can be found on the S/4HANA On-Premise system. In addition, SAP Labs Japan is working to put the information for SAP S/4HANA On-Premise on API Business Hub along with the information of S/4HANA version.

Let's go back to the first page and check with S/4HANA Cloud.

S/4HANA Cloud here means S/4HANA Cloud ES (Essentials Edition = formerly Multi-Tenant Edition).

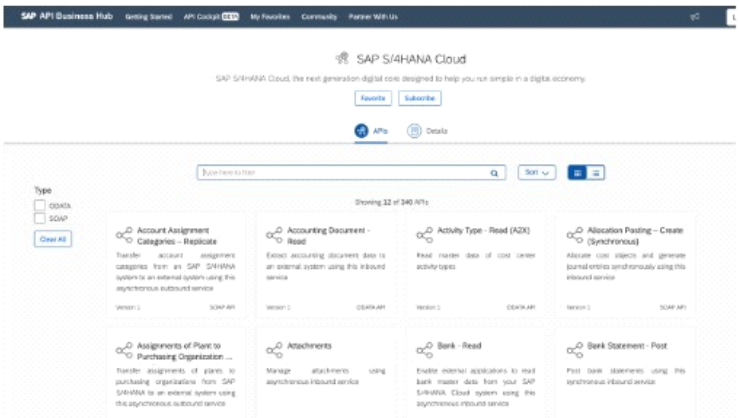
https://blogs.sap.com/2019/08/22/sap-s4hana-cloud-and-on-premise-deployment-options/

As a release cycle, SAP S/4HANA Cloud ES is updated quarterly with a new version. On the other hand, solutions based on S/4HANA On-Premise software (including SAP S/4HANA Cloud EX * and HEC) will be updated once a year.

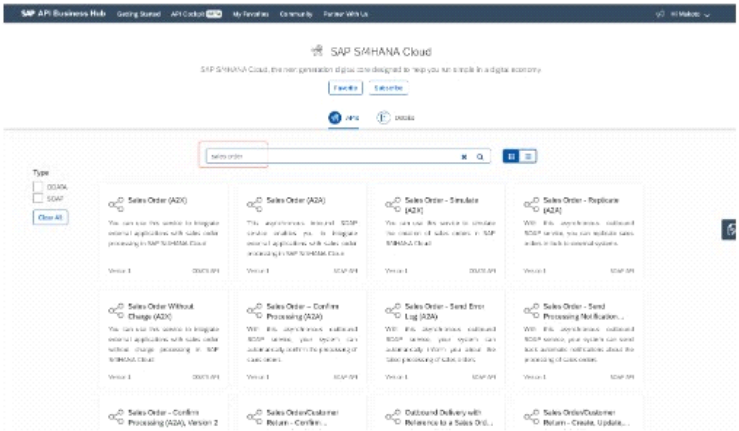
Various new features, including new APIs, are first updated on the S/4HANA Cloud ES side, and S/4HANA On-Premise will usually incorporates those features in the newer release later. This is also true to the new APIs.

In general, S/4HANA On-Premise has a new version once a year, there will be a situation that an API is available in 1809 but not in 1709.

** S/4HANA Cloud EX: S/4HANA Cloud Extended Edition – formerly known as S/4HANA Cloud Single Tenant Edition (STE)*



I want to register a sales order, so enter Sales Order and search.



You can see that many APIs end with service categories such as (A2A), (B2B), (A2X).

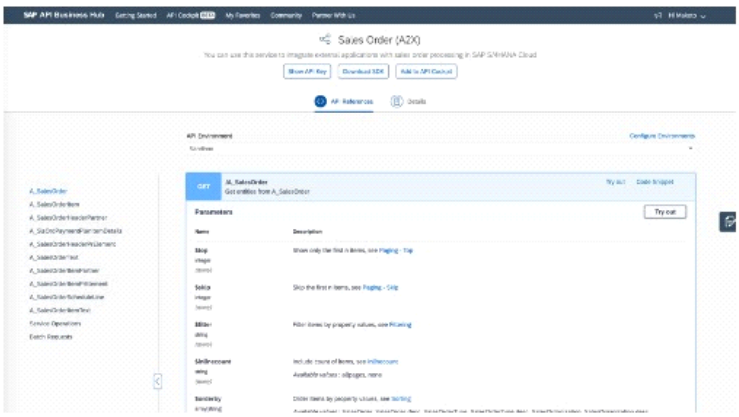
- A2A (Application to Application): Exchange data from system to system within a company
- B2B (Business to Business): Exchange data from one system to another
- A2X (Application to X user or Application to Cross Application): API to get the application to be used via UI etc.

https://wiki.scn.sap.com/wiki/display/HOME/Abbreviations+in+SOA

https://help.sap.com/viewer/229e86fa75e842a8b4134353eb9ba99c/750%20SP17/en-US/9141bb5d52dd420a99ffe5fc88e3da4a.html

Although it is technically possible to use the OData API for data exchange between systems, it is often the A2X category because it is easier to use directly from the UI compared to SOAP. There are many APIs that do not have any category.

Click **Sales Order (A2X)** on the tile on the above screen, and the screen below is displayed.

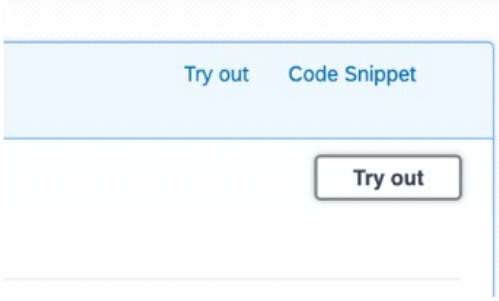


This API References tab allows you to view and test the API specifications.

Here, you can connect to your company's system and test it by pressing **Configure Environments**, but since API Business Hub basically assumes a cloud solution to be connected, the system would need to accessible via HTTP from the public Internet.

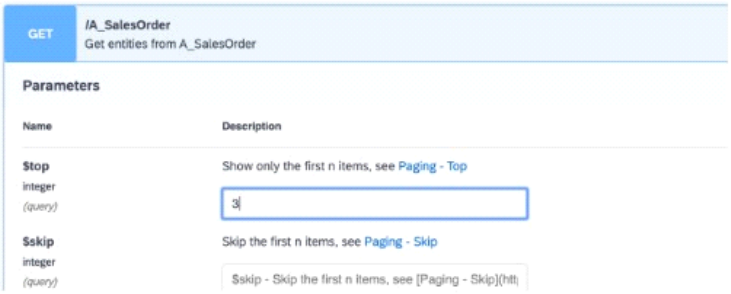
Usually On-Premise system is only accessible from the corporate network and we cannot use this feature in that case.

Here let's try to use the public sandbox system.
Press the Try out button.



Let's put 3 in $ top and get only 3 from the sandbox system.

Select to_Item and to_partner for $ expand and press Execute in



order to display details of line items and business partners at the same time.

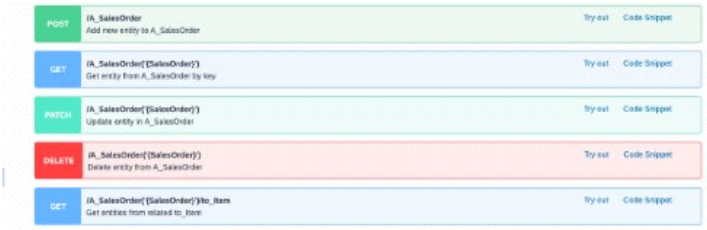
Certainly, the HTTP return code 200 (success) returned 3 results of the Sales Order.

Sales Order Items information is also included in to_item.

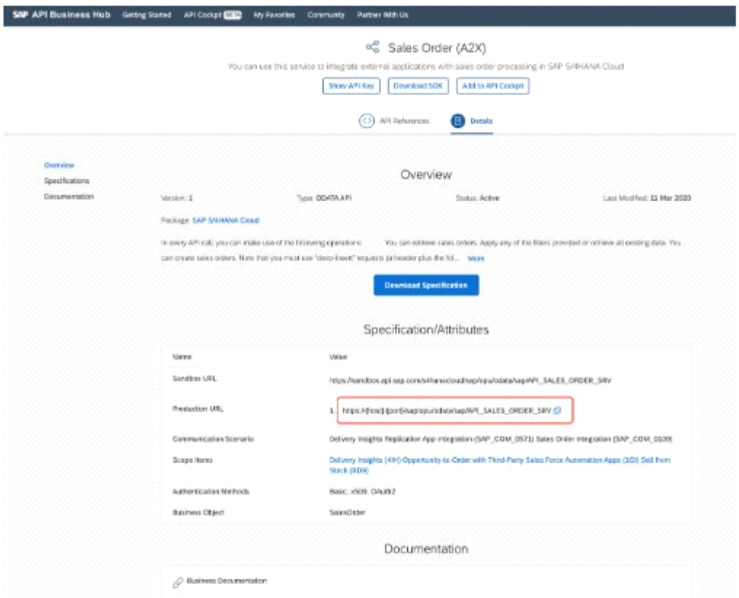
Sales Order Items information is also included in to_item.

I was able to confirm that the data was the data for the order receipt I expected.

Also, since there is a POST, you can see that you can register data.



You can access information and documentation for this API on the Details tab.



Here, you can check the URL, authentication information, and associated Business Object information.

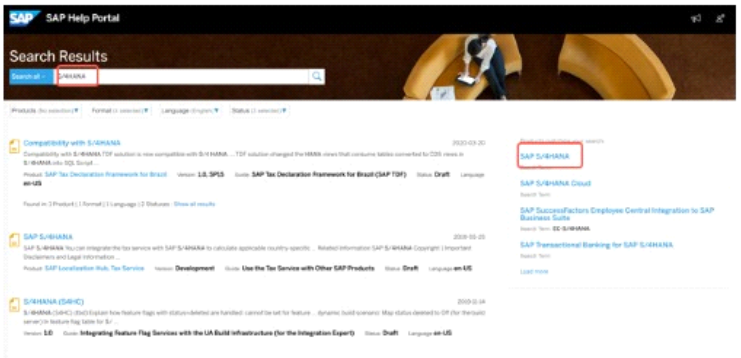
Click Business Documentation to display S/4HANA Cloud (ES) information.

Currently there is no direct link to the S/4HANA On-Premise documentation,

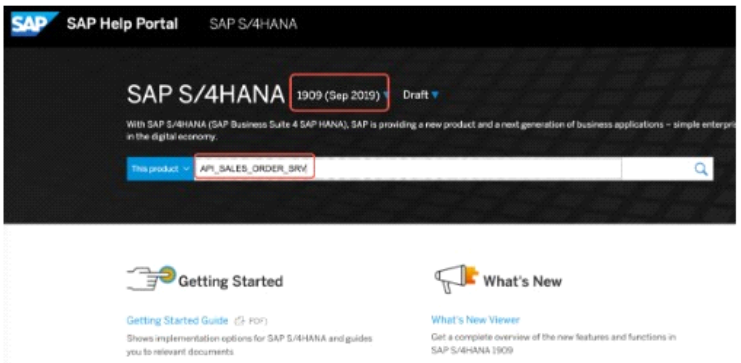
Currently there is no direct link to the S/4HANA On-Premise documentation, so

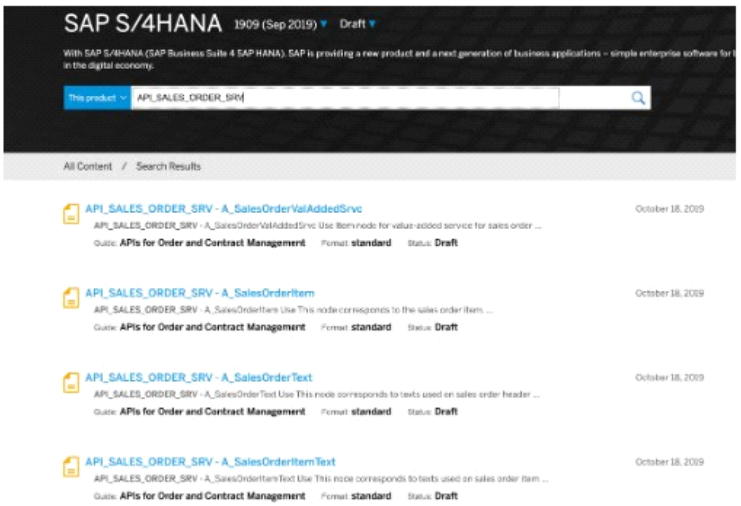
Let's search for help.sap.com using the technical information API_SALES_ORDER_SRV .

First, search for On-Premise S/4HANA with the keyword S/4HANA.



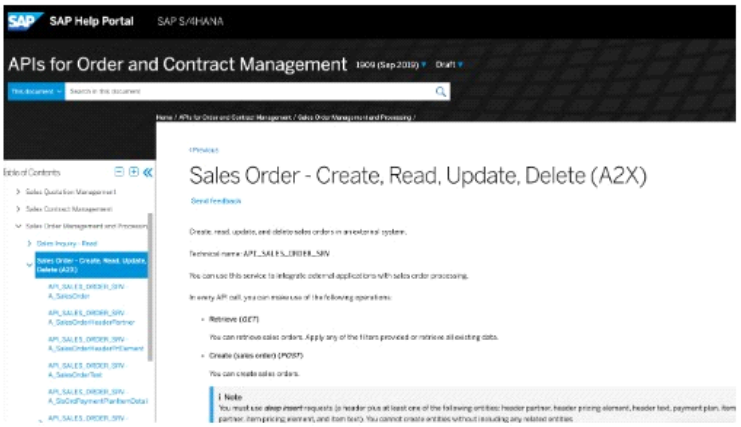
On the next page, select the version you want to check (1909 in the figure below) and enter the keyword of the technical name (API_SALES_ORDER_SRV in the figure below).



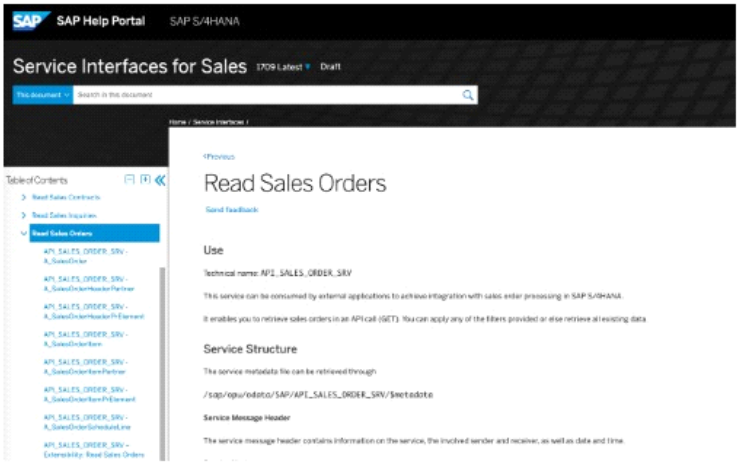


After selecting the search contents and climbing up the tree, I came to the information of the Sales Order API in the 1909 version.

information of the Sales Order API in the 1909 version.



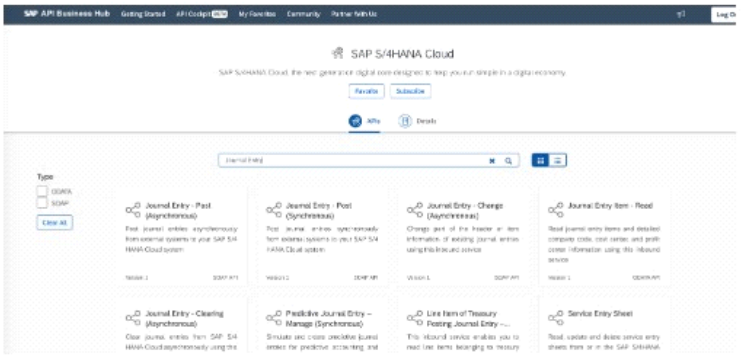
If you do the same thing for SAP S/4HANA 1709, you can find "Read Sale Order" because only read-API is available for 1709.



4. Finding a SOAP API

Let's try to looking for the API for creating accounting documents.

Search on S/4HANA Cloud in API Business Hub using the keyword Journal Entry.



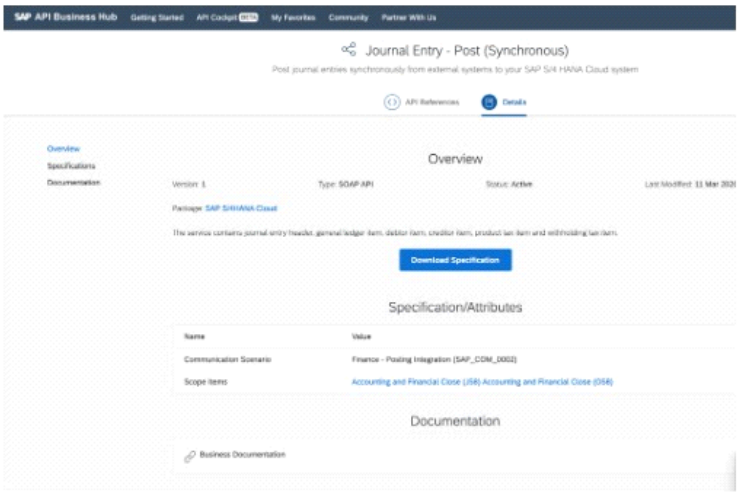
There is currently no OData API for registering accounting slips, it seems that it is only the SOAP API.

There are two types, Synchronous and Asynchronous, so this time click the

There is currently no OData API for registering accounting slips, it seems that it is only the SOAP API.

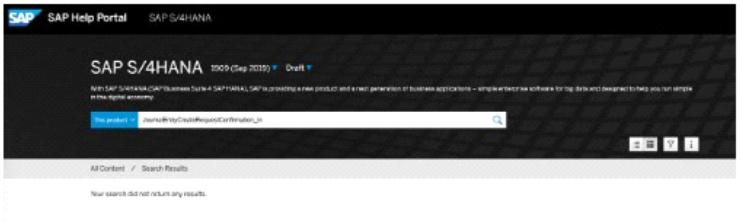
There are two types, Synchronous and Asynchronous, so this time click the Synchronous one.

You can download the WSDL (Web Service Description Language-the file that defines the SOAP message metadata) here.

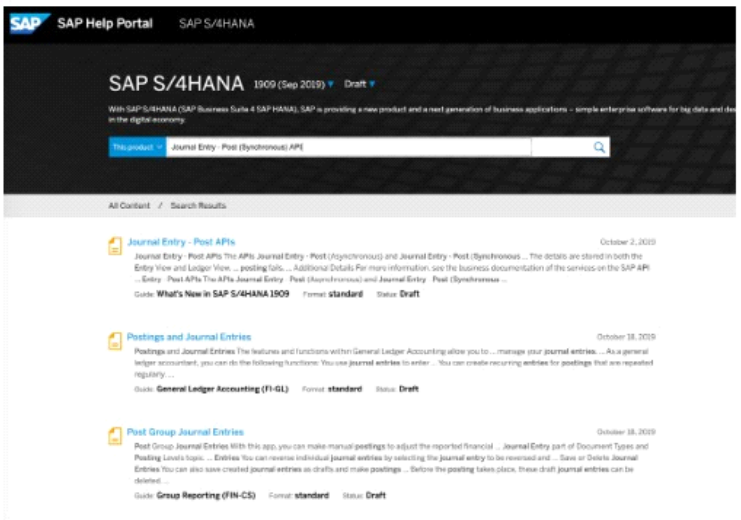


The linked help is for S/4HANA Cloud (ES), so I will check if it exists in On-Premise.

First of all, I tried to search by entering the technical name in Help of S/4HANA On-Premise, but unfortunately help did not appear.



Next time you search with the likely name + API, it seems to be available because it came somehow.

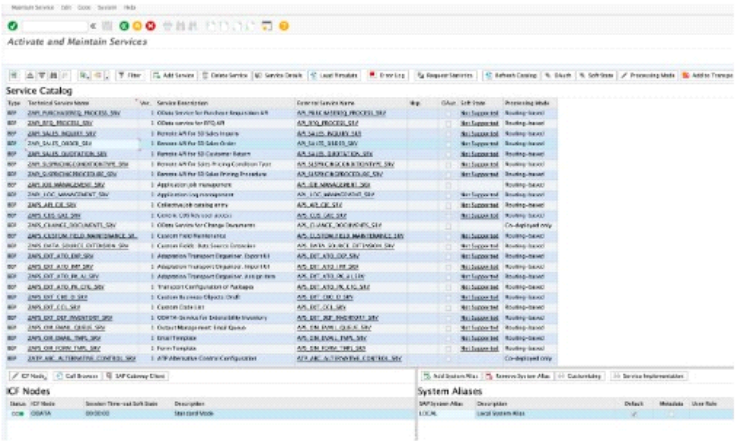


The fist one might be the right one.

5. Test OData and SOAP with the actual SAP S/4HANA OP system

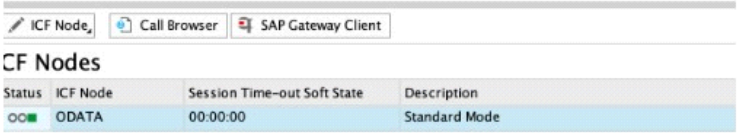
To check if the API really meets our requirements, we also need to go into the actual S/4HANA system and check it.

Go to t-code /IWFND/MAINT_SERVICE to get the list of OData API.



If there is no corresponding service, add it from the Add Service button at the top.

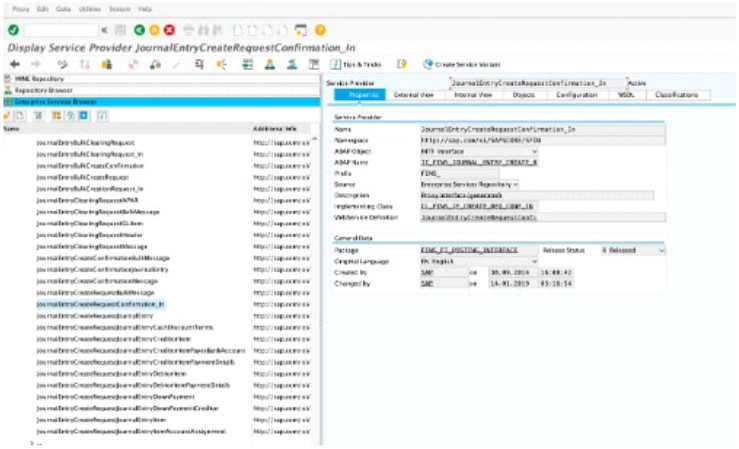
From the Call Browser button at the bottom left, you can check with a browser if it is only a query system.



In order to try create/update document such as POST / PUT / PATCH, it is necessary to use SAP Gateway Client or an external tool such as Postman for the testing.

In the case of SOAP, you can check it from the Enterprise Services Browser tab of t-code SE80.

In the case of SOAP, you can check it from the Enterprise Services Browser tab of t-code SE80.

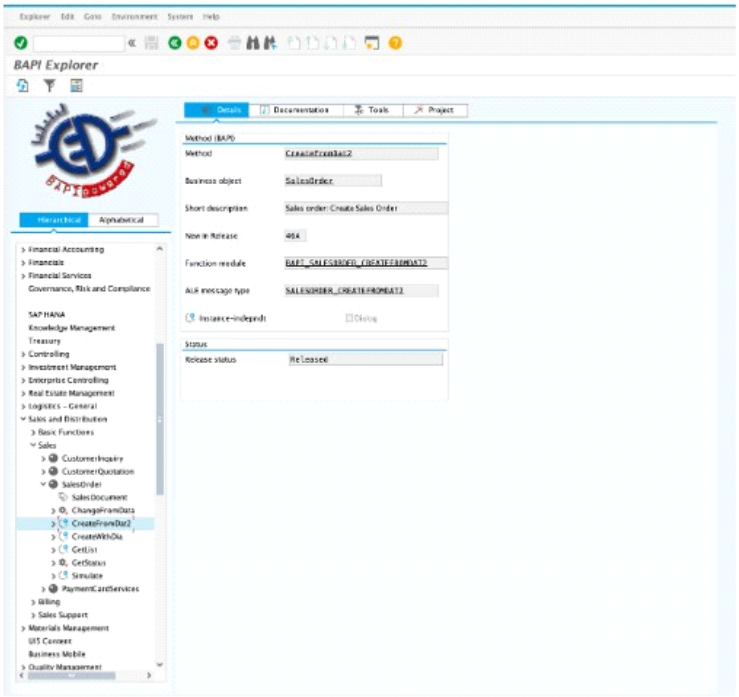


You can also check the movement with the test tool here.

6. Finding BAPI or IDoc search and test it

Check BAPI

If the OData API for create/update does not exist, it may be necessary to check if the corresponding BAPI exists.
In this case, you will go into the actual system and access the BAPI Explorer with the t-code BAPI.

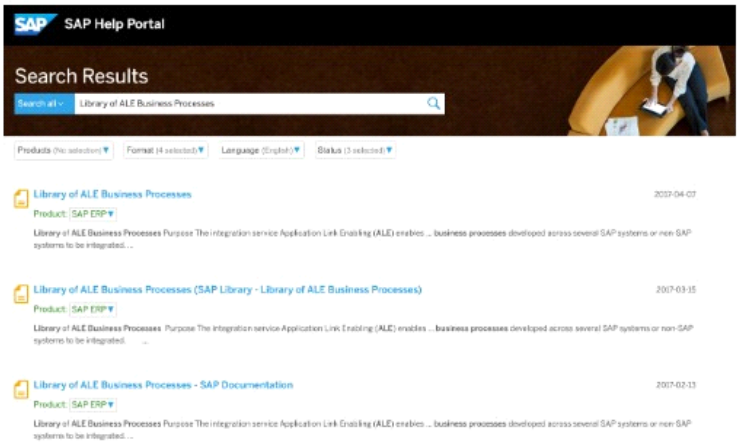


In BAPI Explorer, BAPI can be searched in the form associated with Business Object.

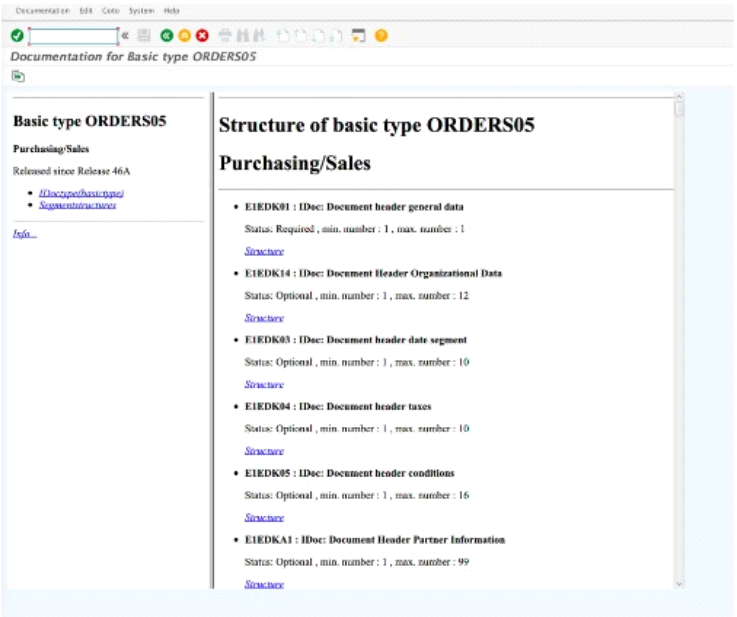
For IDoc

For IDoc

The ALE scenarios are organized by what I looked for in the Online Help Library of ALE Business Processes. This mainly contains information on SAP ERP (SAP R/3) fellowship scenarios (such as master data distribution).



Type information of IDoc type can be confirmed on t-code WE60.



IDoc integration with other systems is also included in the content of SAP Cloud Platform Integration.

7. Conclusion

As we have seen, in SAP S/4HANA On-Premise, there are relatively new APIs such as OData and SOAP, as well as the API that have existed since the SAP R/3 era, BAPI and IDoc.

If you want to build a UI or application on SAP Cloud Platform to connect with S/4HANA, I would recommended to check if OData API is available first. As we will explain in a subsequent blog, OData API is consumable with a library called SAP Cloud SDK, it is very easy to use. And because OData API can be regarded as a JSON-based REST service, it is easy to consume from the UI as well as server side logic.

called SAP Cloud SDK, it is very easy to use. And because OData API can be regarded as a JSON-based REST service, it is easy to consume from the UI as well as server side logic.

If the standard OData API does not exist, it is possible to develop custom OData API in SAP S/4HANA. But in that case, in order to update the SAP standard object, BAPI must be used in the ABAP logic inside of the ABAP logic.

SOAP APIs are generally used by server-side applications rather than the direct consumption from the UI. Since it is possible to generate SOAP Client (Stub) with WSDL, you can develop an application that runs on SAP Cloud Platform Cloud Foundry in Java etc. and send a SOAP message to the SAP S/4HANA OP system.

IDoc was originally developed for EDI and is intended for asynchronous data communication, so it is often used with SAP Cloud Platform Integration.

API-related information is listed in the SAP API Business Hub, but the API information on the S/4HANA On-Premise system is not there yet.. Therefore, it is required to get the information by using Online Help etc. at the moment, but we will update this blog as soon as API Business Hub is updated.
For now, I think it's a practical way to check the information of SAP S/4HANA Cloud (EX) for OData and SOAP and check if it can be applicable to On-Premise as well.

Alert Moderator

2 Comments

You must be Logged on to comment or reply to a post.

Swathi Vuddala — July 13, 2020 at 11:58 am

Very detailed and informative blog...Thank you very much..

Regards

Swathi V

Like(0)

Shinsuke Soeda — September 23, 2020 at 9:11 am

Very good blog, Sugishita-san !

Like(0)

SAP API Business Hub

Sunday, March 7, 2021 11:42 AM

SAP API Business Hub

https://api.sap.com/

SAP API Business Hub - Explore, discover and consume APIs, pre-packaged Integrations, Business Services and sample apps

ODATA V4

Tuesday, March 23, 2021 11:38 AM

HANA ODATA V4 NodeJS

Tuesday, June 14, 2022 6:47 PM

Hana XSA OData V4 Node.Js

From <https://answers.sap.com/questions/13543019/hana-xsa-odata-v4-nodejs.html>

Thomas Jung
Dec 08, 2021 at 02:25 PM

You would use the SAP Cloud Application Programming Model for OData V4 support in the XSA context. There are lots of materials available on this subject. For example:
capire - home (cloud.sap)
Unit 2: Evolution of Core Data Services (CDS) | Software Development (sap.com)
SAP HANA Basics For Developers: Part 9.1 OData V4 Services in Node.js From CAP CDS - YouTube

From <https://answers.sap.com/questions/13543019/hana-xsa-odata-v4-nodejs.html>

https://answers.sap.com/questions/661771/error-building-coredb-with-cross-container-access.html	Error building core_db with cross-container access From <https://answers.sap.com/questions/661771/error-building-coredb-with-cross-container-access.html>

SAP Fiori Elements Now Supports OData V4 | SAP Blogs

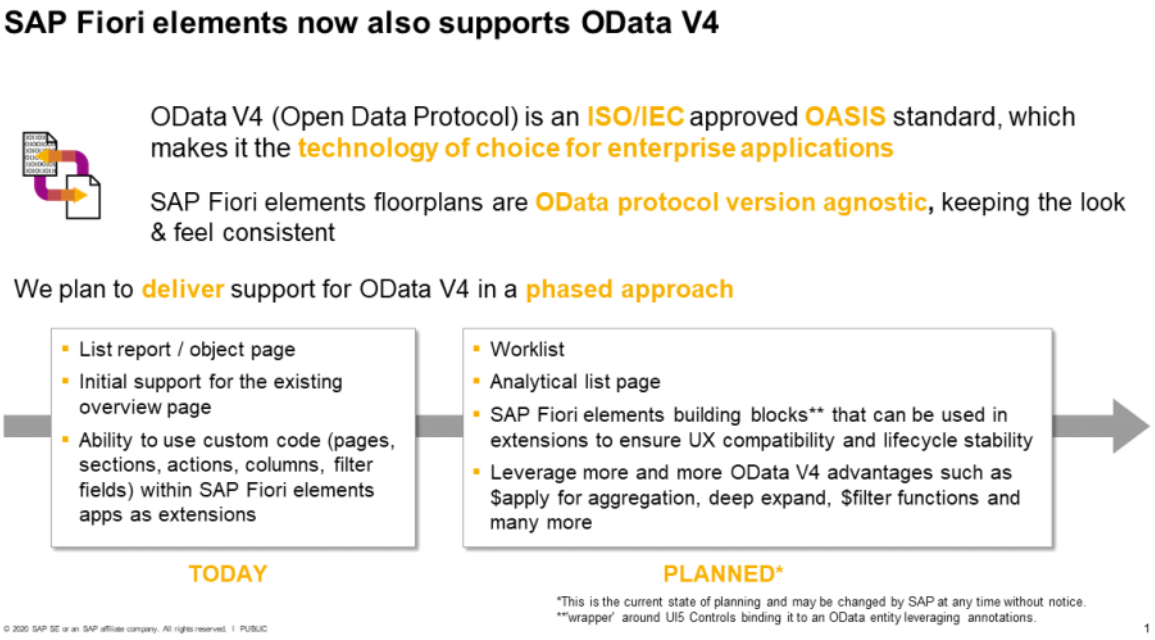
Tuesday, March 23, 2021 10:21 AM

Clipped from: https://blogs.sap.com/2020/11/27/sap-fiori-elements-now-support-odata-v4/

With **SAPUI5 1.84** we are making the libraries for the **SAP Fiori elements floorplans for OData V4 generally available** for all customers and partners. SAP Fiori elements floorplans are **OData version agnostic**, which means that the look & feel of e.g. an SAP Fiori elements list report for OData V4 will be exactly the same as that of an SAP Fiori elements list report for OData V2. And, of course, the same applies to all other supported page types.

OData V4 has been standardized by OASIS and approved as an ISO/IEC International Standard. This is one of several reasons why it is the protocol of choice for enterprise applications for many of our customers. It also comes with a number of benefits compared to version 2, for example reduced metadata size through service partitioning and compact JSON format or built-in analytics features. Additional information on OData, why it is important for SAP and in particular for SAP Fiori elements is outlined in our initial announcement about the OData V4 beta program.

This initial version, which we have released with SAPUI5 1.84, includes the most popular floorplans – **list report/object page** – as well as initial support for the existing **overview page**, allowing to display content coming from both OData V2 and/or V4 services. It also introduces the Flexible Programming Model, which enables increased lifecycle stability, UX consistency and development efficiency for extensions. These extensions allow you to use SAPUI5 freestyle code – as custom pages, sections, actions, fields, columns and filter fields – within SAP Fiori elements apps. Find out about the supported features using our feature map. And of course, SAP Fiori tools will give you the same great developer experience that you are already used to from the OData V2 stack also for creating OData V4 based apps.



There are already several SAP Fiori apps for S/4HANA that leverage the OData V4 stack. This includes for example the Sales Order Request, Manage Settlement Documents or Create Sales Order. And the Create Sales Order app already leverages some of the advantages from the OData V4 stack, for example the fast line creation feature.

We also successfully ran a guided beta program with who have used the new functionality to build their own apps using the SAP Fiori elements floorplans for OData V4. The feedback was very positive and clearly told us that the functionality is ready to be released!

So you can now get access to the SAP Fiori elements libraries for OData V4 through SAPUI5 1.84.

Learn more

Watch our video summarizing what's new in SAP Fiori elements floorplans for OData V4.

You can create your own SAP Fiori elements list report / object page based on an OData V4 service built on SAP Cloud Application Programming model in this tutorial.

Furthermore we are also offering a hands-on session at TechEd. If the session is full, no worries, we plan to make the material available after SAP TechEd so you can try the exercises on your own.

Outlook

We plan to deliver additional functionality for the SAP Fiori elements

floorplans for OData V4 in a phased approach, focusing on:

- Analytical list pages with sequentially increasing analytics capabilities, also leveraging OData V4 advantages such as $apply for aggregation
- Flexible Programming Model: SAP Fiori elements building blocks that can be used in extensions to SAP Fiori elements apps.
  These building blocks will essentially be ‘wrappers’ around UI5 Controls, binding them to an OData entity leveraging annotations. They shall also support the UI functionalities provided out of the box by SAP Fiori elements, for example navigation or editability with draft handling.
- Leveraging more and more OData V4 specific capabilities. For example: filtering across 1:n association or deep expands

Check the SAP Fiori roadmap section ‘SAP Fiori elements and SAP Fiori tools’ for more details.

Kindly note that this is the current state of planning and can be changed by SAP at any time without further notice.

OData V4 code based implementation – Overview | SAP Blogs

Tuesday, March 23, 2021 10:21 AM

Clipped from: https://blogs.sap.com/2017/12/12/odata-v4-code-based-implementation-overview/

This blog is meant as an introduction of a series of blogs in which I will explain the use of the new SAP Gateway V4 framework.

It is meant for those readers that must create OData V4 series now and that cannot wait until an end-2-end support for OData V4 will be available through the new ABAP programming model.

Before starting code based OData V4 development you should check my blog OData service development options where I outline in more detail what the recommended options for OData development are right now.

Updates

- 13.12.2017 – added link to the first how to guide and the blog that explains the OData service devlopment options in more detail

Table of contents

This blog is part of blog series about OData V4 code based development

OData V4 code based implementation – Overview

OData V4 code based implementation I (basic interface, read access)

OData V4 code based implementation I (basic interface, create&update)

Demo system ES5

In order to access the source code below you have to register in the new ES5 demo system

Sign up for a demo account on ES5 here

More details about the ES5 demo system as such you will find in my following blog

New SAP Gateway Demo System available

Source code

If you have a user in ES5 you will be able to access the ABAP code via the following links.

Data provider class – zcl_e2e001_odata_v4_so_data

Model provider class – zcl_e2e001_odata_v4_so_model

Exception class – zcx_e2e001_odata_v4_so

Interface – zif_e2e001_odata_v4_so_types

Consumption view – sales order – ze2e001_c_salesorder

Consumption view sales order items – ze2e001_c_salesorderitem

Interface view – ze2e001_i_salesorderitem_e

What's new in the protocol?

The main paradigm: Reduction of data

The main paradigm of the OData V4 paradigm is the reduction of data. This reduction is achieved through a more powerful query language and a new optimized JSON protocol. At the same time it is possible to leverage richter metadata as compared to OData V2.

New JSON format

The OData V4 protocol comes with a very lean JSON procol. The response payload now basically only contains name value pairs. The metadata has been reduced to a a single line

```
"@odata.context" : "$metadata#SalesOrder/$entity"
```

as opposed to the more richer metadata information in the V2 response payload, both highlighted in blue in the following figure.

Cross service references

Cross service navigation enables inter communication of services. With this, navigation properties of entities of one service can reach entities of another service in a service group. With the support of cross service navigation several requirements of SAP Fiori like applications can be addressed.

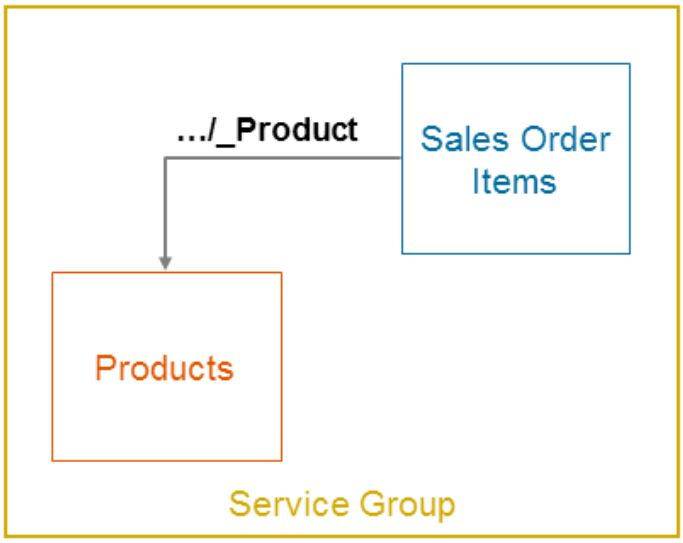
1.) The rich metadata can be leveraged but at the same time not the complete data model has to be loaded at startup time of an application. There is rather the option to have a lazy loading of parts of a service model on demand.

2.) Services can be reused more easily since services can be partioned without the loss of navigation.

Examples of such services that can be reused in various SAP Fiori applications are Users, Attachments, Conditions, Addresses, …

Please note:

Cross service references are only possible within one service group.



If a request like the following is issued:

```
…/SalesOrderItems(SalesOrder='500000000', SalesOrderItem='10')/_Product
```

one would receive a response like the following where it is indicated via the @odata.context annotation that this response stems from another service.

```
{
"@odata.context" : "../../sap/Product/0001/$metadata#Product/$entity",
  "value" : [
    {
      "Product" : "HT-1000",
      "Currency" : "EUR",
      ...
    }
  ]
}
```

Support for Any and All

New is the support of the query options any and all.

With these it is now possible to find all sales orders where at least one of the items contains a particular product

```
…/SalesOrders?$filter = _Item/any(d:d/Product eq 'HT-1007')
```

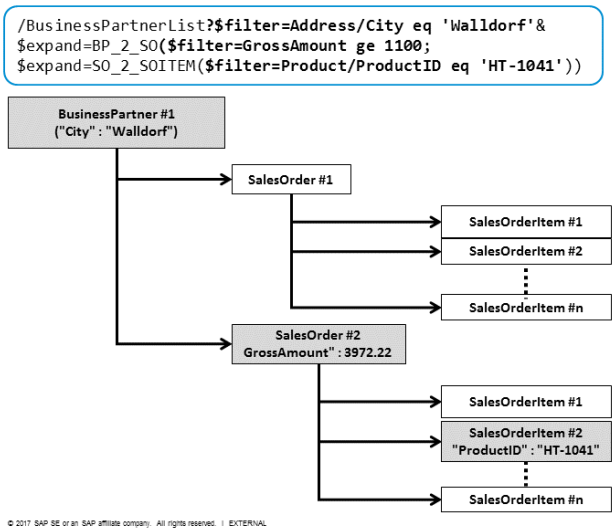
or it is possible to find all sales orders where every item has a price greater than $100

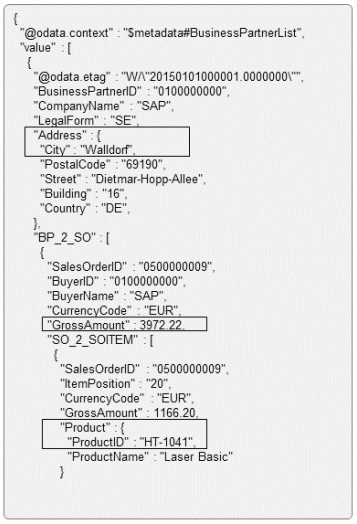
```
…/SalesOrders?$filter = _Item/all(d:d/Price ge 100)
```

Filter on expanded result sets

New in OData V4 is the option for filtering on each level of an expanded enttiy set. In the following figure you see a request that

1. reads all business partners that are located in 'Walldorf'
2. reads all sales orders of those business partners where the gross amount exceeds 1100 Euro
3. reads only those items that contain the product HT-1041.





What's new in the framework?

Advanced, intermediate and basic interfaces

The API that is used to develop OData V4 services has significantly changed compared to the API that is used to develop OData V2 services.

When you implement the methods of the basic interface you will get a working OData V4 service that will satisfy most requests. Complex requests such as $expand are then handled by the framework that will call the methods for the basic interface in the correct order.

The mplementation of the intermediate or advanced interface should however also be taken into account if your service implementation would be able to handle specific requests such as specific $expand or navigation calls more efficient than by calling the methods of the basic interface recursively.

Name	Purpose
/IWBEP/IF_V4_DP_BASIC	• Methods provide basic functionality • (Create, Update, Delete, Navigation, …) • When being implemented à Working OData service supporting most requests
/IWBEP/IF_V4 _DP_INTERMEDIATE	• Medium complex functionality • eTag handling, PATCH, $expand • Contains generic calls to other (especially the basic) interfaces
/IWBEP/IF_V4 _DP_ADVANCED	• Always called first by the framework • Contains generic calls to the other (especially the basic) interfaces • Will for example be overwritten by the new RESTful ABAP Programming model (planned)
/IWBEP/IF_V4_DP_BATCH	• $batch. Generic $batch and changeset
/IWBEP/IF_V4 _DP_PROCESS_STEPS	• Transaction and lifecycle handling

io_request and io_response

All interface methods have an import parameter called **io_request**. It can be used to retrieve all information you need to handle the request in your service implemenation.

A UPDATE_ENTITY method for example will have the following methods

- GET_BUSI_DATA to retrieve entity data from the request, for example the payload of the incoming

request.
- GET_ENTITY_SET to retrieve the entity set of the processed entity. So we can switch to entity set specific methods

The corresponding parameter ip_response is used to return business data to the SAP Gateway framework and to tell the framework which processing steps the service implementation has handled iself (see todo and done flags below).

Generic framework support – example $expand

As already mentioned you will get a working OData V4 service by only implementing the methods of the basic interface.If a client calls the following URL:

```
GET .../ze2e001_salesorder/0001/SalesOrder('500000000')?$select=Salesorder,Customer&
$expand=_Item($select=Salesorderitem,Product,Grossamountintransaccurrency,Transactioncurrency)
```

the SAP Gateway framework will call the following basic methods in your service implementation:

#	Method call	Purpose
1	…_BASIC~READ_ENTITY	This method will read the data of the sales order header
2	…_BASIC~READ_REF_TARGET_KEY_DATA	This method will read the key fields of the items that can be used by the READ_ENTITY_LIST method as a $filter statement
3	…_BASIC~READ_ENTITY_LIST	This method reads the items.

and would finally return the following data

```
{
  "@odata.context" : "$metadata#SalesOrder(Salesorder,Customer,
_Item(Salesorderitem,Product,Grossamountintransaccurrency,Transactioncurrency,Salesorder))/
$entity",
  "Salesorder" : "500000000",
  "Customer" : "100000000",
  "_Item" : [
    {
      "Salesorder" : "500000000",
      "Salesorderitem" : "10",
      "Product" : "HT-1000",
      "Transactioncurrency" : "EUR",
      "Grossamountintransaccurrency" : 1137.64
    },
    {
      "Salesorder" : "500000000",
      "Salesorderitem" : "20",
      "Product" : "HT-1001",
      "Transactioncurrency" : "EUR",
      "Grossamountintransaccurrency" : 2972.62
    },
...
  ]
}
```

Please note:
With OData V4 now query options are supported on all levels of an $expand statement.

ToDo and Done-Flags

The SAP Gateway V4 framework has introduced so called ToDo-Flags which provide a hint for the application developer what his implemenations has to do. Depending ont the query options that have been used in the request you will get simple list with boolean values for the following flags:

deltatoken, select, filter, skip, orderby, skiptoken, search, top, …

Done-Flags confirm that the response fits to the request. They allow the application developer to inform the framework to handle feature generically e.g., $top, $skip, and $select. Using such flags also allows an implementation tobe compatible in the future. Instead of a wrong result an exception will be raised if a done flag is not set.

The list of todo and done flags will vary depending on the method which is called. (READ; READ_LIST, CREATE, …)

For a simple GET request with a $filter query option:

```
…/SalesOrder?$filter=Customer eq ‚SAP‘
```

a service implementation would have to look like as follows.

At the beginning of our service implementation we have to check whether we have to handle the filter option. For this we call the method *io_request->get_todos*. Then we have to check whether the flag *ls_todo_list-process-filter* is set. If yes, the filter string is requested via the method *io_request-> get_filter_osql_where_clause* and the flag that we have handled the filter query option is set in the structure *ls_done_list*. This information is at the end sent back to the framework via the method *io_response->set_is_done* that takes the done-list as a parameter.

```
io_request->get_todos( importing es_todo_list = ls_todo_list ).
...
if ls_todo_list-process-filter = abap_true.
  io_request->get_filter_osql_where_clause( importing ev_osql_where_clause = lv_where_clause ).
  ls_done_list-filter = abap_true.
endif.
...
" Report list of request options handled by application
io_response->set_is_done( ls_done_list ).
```

What's New with OData 4: OData 2 vs OData 4

Tuesday, March 23, 2021 10:22 AM

Clipped from: https://www.progress.com/blogs/whats-new-with-odata-4-odata-2-vs-odata-4

OData 4 differs significantly from OData 2. Learn about the differences between them when using Hybrid Data Pipeline and decide whether you need OData 2, OData 4 or both.

OData (Open Data Protocol) defines a set of best practices for building and consuming RESTful APIs. OData is very popular and has been adopted by many technologies and companies including SAP, IBM, Salesforce, Tableau, Databoom, Progress, Red Hat and Dell. If you'd like to learn the basics of OData, see our OData FAQs.

Progress is proud to serve on the OData Technical Committee. In fact, we were one of the original members of this committee, along with other technical giants such as IBM, Microsoft, SAP, Redhat, CA and Citrix. We offer Hybrid Data Pipeline, the industry's first vendor-agnostic data gateway, which lets you OData-enable your data source through simple clicks.

10 Major Differences Between OData 2 and OData 4

As you consider enabling your application or data source with an OData endpoint, you will invariably ask yourself if you should use OData 2, OData 3 or the latest OData 4 version. While OData 3 and OData 2 are very similar, OData 4 is drastically different from OData 2. With the latest release, Hybrid Data Pipeline can help you produce both OData 2 as well as OData 4 from your data sources. Understanding the differences between these endpoints from Hybrid Data Pipeline can help you decide if you need OData 2, OData 4 or both:

- OData 2 was a Microsoft Open Specification Promise (OSP), while OData 4 is approved by OASIS and ISO. While developers were apprehensive about adopting OData 2, we are observing more adoption for OData 4.
- According to the OData 2 specification, payload had to be retrieved in both XML and JSON formats. In OData 4 however, XML is optional. So, Hybrid Data Pipeline today supports both XML and JSON in OData 2 and only JSON in OData 4. However, the metadata can still be retrieved in

the XML format in OData 4.

- In OData 4, the JSON data format now allows you to control the amount of metadata that is returned in query responses. There are three levels of metadata supported:

  - Full—The response contains all the metadata needed to describe the response.
  - Minimal—The response metadata references the metadata document. Information in the metadata document is not repeated in the response.
  - None—The response contains no metadata. The application must understand the response structure.
- Hybrid Data Pipeline supports batch requests in OData 4 only. Batch requests allow you to submit multiple operations in the form of a single endpoint request. Operations are submitted in the HTTP request payload and can include individual requests and change sets. (For more information on batch requests, see this article.)
- OData 4 adds a new flexible search capability, $search. The search feature allows you to query a collection for entities that match a specified search expression. Unlike the existing filter capability, which allows a query to specify that a specific property or properties match certain criteria, the search feature can apply the search expression to any of the properties of an entity. Hybrid Data Pipeline extends this feature to OData 2 as well using the $ddsearch feature.
- The $expand system query option has been enhanced in OData 4. This feature specifies the related resources to be included in line with retrieved resources. In OData 2, if a single value navigation property is expanded, you get all the properties of the entity if it was a single value navigation property. And if a collection navigation property is expanded, you get all of the entities in the collection and all of the properties of those entities. In OData 4, you can now refine the results using the $select, *, $filter and $top operations:

*	Used to expand all relationships for the entity.
$filter	Used to filter the child entities that appear in the expanded result.
$top	Used to limit the rows that appear in the expanded result.
$select	Used to limit the fields that appear in the expanded result.

- When doing an update there are two ways to update an entity: replace the definition of the entity with a new entity (Replace semantics). Or, you can change individual properties of an existing entity (Edit semantics). The HTTP PUT method is used to update an entity with Replace semantics. In OData 4, the standard HTTP PATCH method is used to update an entity with Edit semantics. OData 2 used the non-standard MERGE HTTP method for updates with Edit semantics.
- $count replaces $inlinecount in OData 4. $count has been enhanced to

be used with $filter, $expand and $orderby options.

- Changes in support for data types in OData 4:

    - DateTime has been deprecated. The lack of timezone information in OData 2 causes significant problems. Use DateTimeOffset instead.
    - Edm.Time has been replaced with Edm.Duration and Edm.TimeOfDay to make it clear whether it is duration of a specific time of day.
    - Edm.Date has been added as there was no way to express just a date in OData 2.
    - Edm.Float has been eliminated.

All these and many other enhancements in OData 4 give a significant performance boost to your application compared to OData 2. You can learn about the other differences in this article from OASIS.

Support OData 2 and OData 4—or Both—Using Hybrid Data Pipeline

Due to the significant changes in the way these frameworks are defined, you'll need different clients to consume both the OData 2 and OData 4 endpoints. Thanks to all the latest changes, OData 4 shows significant performance improvement compared to OData 2. While some functions have been replaced and enhanced, some of them have been deprecated — for example support for the XML Data Format.

If you're building an application for the modern ecosystem, OData 4 is a no brainer as it gives you a significant performance boost. However, some existing applications need OData 2 or an XML payload. For that reason, you should leverage Hybrid Data Pipeline, which supports both interfaces without any coding at all.

GET STARTED

URL patterns

Sunday, June 5, 2022 8:19 AM

/odata/v4/TestHANAProject.DB.models._.TestHANAProejct/

ODATAV4Example1.JAVA_DB.models._.ODATAV4Example1Project

https://sapuxhbd.tcc.etn.com:51161/java/odata/v4/ODATAV4Example1.JAVA_DB.models._.ODATAV4Example1Project

https://sapuxhbd.tcc.etn.com:51162/java/odata/v4/ODATAV4Example1.JAVA_DB.models._.ODATAV4Example1Project

https://my_host_here:51036/java/odata/v4/demo_project.db.cds._.MY_CONTEXT/$metadata

From <https://answers.sap.com/questions/682163/xsa-java-odata-v4-not-working.html>
https://answers.sap.com/questions/682163/xsa-java-odata-v4-not-working.html

https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/e09f5225d61b40bb8761c756f138f2b0.html?locale=en-US&version=2.0.02&q=ODATA%20V4

https://sapuxhbd.tcc.etn.com:51161/java/odata/v4/ODATAV4Example1.JAVA_DB.SampleCDS._.SampleService/Customer

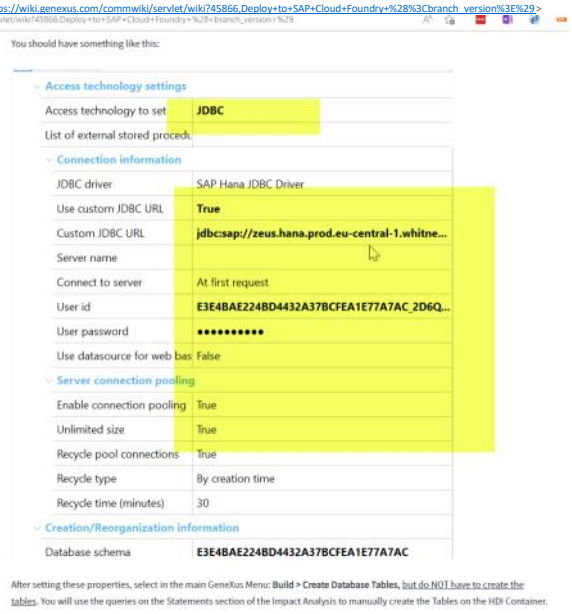
https://sapuxhbd.tcc.etn.com:51161/java/odata/v4/ODATAV4Example1.JAVA_DB.SampleCDS._.SampleService/$metadata

https://sapuxhbd.tcc.etn.com:51161/java/odata/v4/ODATAV4Example1.JAVA_DB.SampleCDS._.SampleService/Customer

https://sapuxhbd.tcc.etn.com:51161/java/odata/v4/ODATAV4Example1.JAVA_DB.SampleCDS._.SampleService2/
https://sapuxhbd.tcc.etn.com:51162/java/odata/v4/ODATAV4Example1.JAVA_DB.models._.SampleService2/

https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/79d56389dfb54075b4e217ef683dc09f.html?version=2.0.01	Database Connection Configuration Details From <https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/79d56389dfb54075b4e217ef683dc09f.html?version=2.0.01>	
https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/79d56389dfb54075b4e217ef683dc09f.html?version=2.0.01	Database Connection Configuration Details From <https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/79d56389dfb54075b4e217ef683dc09f.html?version=2.0.01>	
https://launchpad.support.sap.com/#/notes/2465860 Software Components Software Component / From / To / And Subsequent XS_ADVANCED_RUNTIME 1.00 1.00 XS_TOMCAT 8.00 8.00 XSAC_MONITORING 1 1 XSAC_SERVICES 1 1 XS_JAVASCRIPT 1.00 1.00 XS_JAVA 1.00 1.00 XSAC_PORTAL_SERV 1 1 XSAC_XSA_COCKPIT 1 1		
https://help.sap.com/docs/SAP_HANA_PLATFORM/a4d43a319ecf464e9d838454a6bdb9ad/684a070743dc4809ad6c03805d379147.html?version=2.0.04		
https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/5cad7c6312494b958bb57c676fe06be9.html?version=2.0.01 Enable and Use Java Data Services From <https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/5cad7c6312494b958bb57c676fe06be9.html?version=2.0.01>		
https://blogs.sap.com/2021/09/16/develop-spring-boot-app-with-hana-cloud-in-cloud-foundry/ Develop Spring Boot App with HANA Cloud in Cloud Foundry From <https://blogs.sap.com/2021/09/16/develop-spring-boot-app-with-hana-cloud-in-cloud-foundry/>		
Deploy to SAP Cloud Foundry		

From <https://wiki.genexus.com/commwiki/servlet/wiki?45866,Deploy+to+SAP+Cloud+Foundry+%28%3Cbranch_version%3E%29>



Cust

SAP note for JAVa install

Tuesday, June 14, 2022 6:46 PM

https://launchpad.support.sap.com/#/notes/2939461

Standard Java Client Libraries for XS Advanced

From <https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/6511bc054b0e48369a625a8019fefd53.html?version=2.0.05#loio6511bc054b0e48369a625a8019fefd53__section_mwr_xw4_dz>

https://launchpad.support.sap.com/#/softwarecenter/search/XS_JAVA

XS_JAVA: Standard Java Client Libraries for XS Advanced

From <https://help.sap.com/docs/SAP_HANA_PLATFORM/4505d0bdaf4948449b7f7379d24d0f0d/6511bc054b0e48369a625a8019fefd53.html?version=2.0.04>

XS runtimes in HBD

Wednesday, June 15, 2022 7:37 AM

[Yesterday 2:35 PM] Vedula, Hari
Hello Jesus

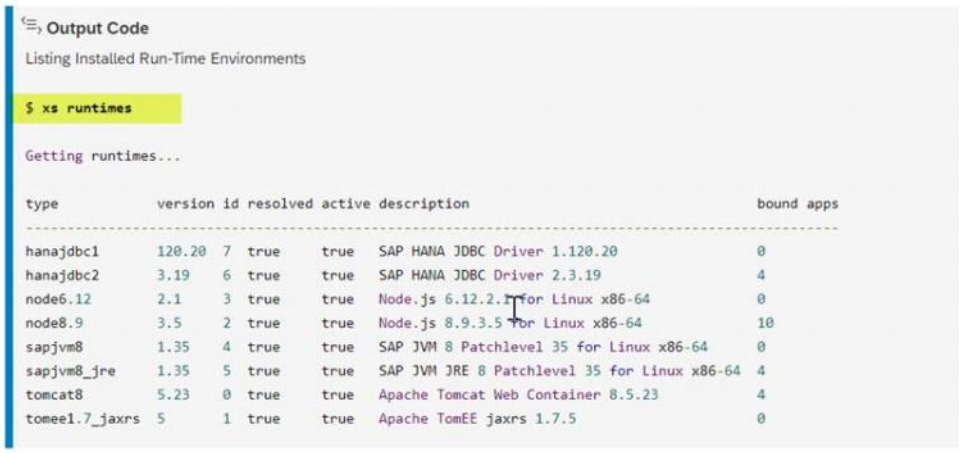
[Yesterday 2:35 PM] Vedula, Hari
https://help.sap.com/docs/SAP_HANA_PLATFORM/6b94445c94ae495c83a19646e7c3fd56/c58763e1c81844ac9221631513d8f967.html?version=2.0.05
SAP Help Portal

[Yesterday 2:35 PM] Vedula, Hari
Could you run "xs runtimes" command on HDB and provide the list it generates to me?

[Yesterday 2:35 PM] Vedula, Hari
I need the list of runtimes installed on our server

[Yesterday 2:36 PM] Vedula, Hari
I dont have access to the command line

[Yesterday 2:36 PM] Vedula, Hari



simtcudd0670:HDB:hbdadm /usr/sap/HBD/HDB00 51> xs runtimes

Getting runtimes...

type version id resolved active description bound apps

---
hanajdbc1 120.56 9 true true SAP HANA JDBC Driver 1.120.56 0
hanajdbc1 120.57 19 true true SAP HANA JDBC Driver 1.120.57 0
hanajdbc2 4.80 8 true true SAP HANA JDBC Driver 2.4.80 0
hanajdbc2 4.81 20 true true SAP HANA JDBC Driver 2.4.81 26
node10.22 0.0 2 true true Node.js 10.22.0 for Linux x86-64 1
node10.24 1.0 12 true true Node.js 10.24.1 for Linux x86-64 34

node12.18 3.0 0 true true Node.js 12.18.3 for Linux x86-64 1
node12.22 4.0 14 true true Node.js 12.22.4 for Linux x86-64 16
node14.17 4.0 15 true true Node.js 14.17.4 for Linux x86-64 55
sapjvm8 1.65 5 true true SAP JVM 8 Patchlevel 65 for Linux x86-64 0
sapjvm8 1.78 17 true true SAP JVM 8 Patchlevel 78 for Linux x86-64 1
sapjvm8_jre 1.65 7 true true SAP JVM JRE 8 Patchlevel 65 for Linux x86-64 0
sapjvm8_jre 1.78 18 true true SAP JVM JRE 8 Patchlevel 78 for Linux x86-64 32
sapmachine11 0.12 16 true true SapMachine 11.0.12 for Linux x86_64 0
sapmachine11 0.8 6 true true SapMachine 11.0.8 for Linux x86_64 0
tomcat8 5.57 3 true true Apache Tomcat Web Container 8.5.57 0
tomcat8 5.69 11 true true Apache Tomcat Web Container 8.5.69 23
tomee1.7_jaxrs 5.0 13 true true Apache TomEE jaxrs 1.7.5.0 0
tomee1.7_jaxrs 5.11 4 true true Apache TomEE jaxrs 1.7.5.11 7
tomee7.0_webprofile 6.8 1 true true Apache TomEE webprofile 7.0.6.sap-08.7 0
tomee7.0_webprofile 9.7 10 true true Apache TomEE webprofile 7.0.9.sap-07 1

From <https://teams.microsoft.com/multi-window/?agent=electron&version=22050101009>