

SAP First Guidance – SAP BW on/for HANA: Deploy SAP BW/4HANA to Microsoft Azure Cloud

Applicable Releases:

SAP BW/4HANA 1.0 SP08

SAP BW/4HANA 2.0 SP00

SAP BW/4HANA 2021 SP00

and higher

The Document is not intended to be exhaustive, as additional functionality might be added on purpose.

SAP BW/4HANA is a new SAP product that replaces SAP Business Warehouse in a logical way. BW/4HANA runs only on HANA platform and will be the foundation for a new lineage of data warehousing solutions from SAP.

Furthermore, it optimizes and simplifies a customer's BW environment and experience (like S/4HANA). BW/4 HANA (DW4CORE) is a new code-line on which all future BW enhancements will take place. Classic BW goes into maintenance mode.

This SAP First Guidance Document put's is emphasize to the complete functional scope (CFS) to ensure the full functionality right from the start of the Implementation of SAP BW/4HANA 1.0 SP08 and 2.0 SP00 and higher also in the Microsoft Azure Cloud.

For more information, contact roland.kramer@sap.com

SAP First Guidance – SAP BW/4HANA in Microsoft Azure Cloud

Customer

SAP BW/4HANA

Version 1.46

August 2022

© Copyright 2022 SAP SE. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE. The information contained herein may be changed without prior notice.

Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Excel, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, System i, System i5, System p, System p5, System x, System z, System z10, System z9, z10, z9, iSeries, pSeries, xSeries, zSeries, eServer, z/VM, z/OS, i5/OS, S/390, OS/390, OS/400, AS/400, S/390 Parallel Enterprise Server, PowerVM, Power Architecture, POWER6+, POWER6, POWER5+, POWER5, POWER, OpenPower, PowerPC, BatchPipes, BladeCenter, System Storage, GPFS, HACMP, RETAIN, DB2 Connect, RACF, Redbooks, OS/2, Parallel Sysplex, MVS/ESA, AIX, Intelligent Miner, WebSphere, Netfinity, Tivoli and Informix are trademarks or registered trademarks of IBM Corporation.

Linux is the registered trademark of Linus Torvalds in the U.S. and other countries.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademark of Oracle Corporation.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Java is a registered trademark of Sun Microsystems, Inc.

JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

SAP, R/3, SAP NetWeaver, Duet, PartnerEdge, ByDesign, SAP BusinessObjects Explorer, StreamWork, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE in Germany and other countries.

Business Objects and the Business Objects logo, BusinessObjects, Crystal Reports, Crystal Decisions, Web Intelligence, Xcelsius, and other Business Objects products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of Business Objects Software Ltd. Business Objects is an SAP company.

Sybase and Adaptive Server, iAnywhere, Sybase 365, SQL Anywhere, and other Sybase products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of Sybase, Inc. Sybase is an SAP company.

All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary. The information in this document is proprietary to SAP. No part of this document may be reproduced, copied, or transmitted in any form or for any purpose without the express prior written permission of SAP SE.

This document is a preliminary version and not subject to your license agreement or any other agreement with SAP. This document contains only intended strategies, developments, and functionalities of the SAP® product and is not intended to be binding upon SAP to any particular course of business, product strategy, and/or development. Please note that this document is subject to change and may be changed by SAP at any time without notice.

SAP assumes no responsibility for errors or omissions in this document. SAP does not warrant the accuracy or completeness of the information, text, graphics, links, or other items contained within this material. This document is provided without a warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. SAP shall have no liability for damages of any kind including without limitation direct, special, indirect, or consequential damages that may result from the use of these materials. This limitation shall not apply in cases of intent or gross negligence.

The statutory liability for personal injury and defective products is not affected. SAP has no control over the information that you may access through the use of hot links contained in these materials and does not endorse your use of third-party Web pages nor provide any warranty whatsoever relating to third-party Web pages.

SAP "How-to" Guides are intended to simplify the product implementation. While specific product features and procedures typically are explained in a practical business context, it is not implied that those features and procedures are the only approach in solving a specific business problem using SAP NetWeaver. Should you wish to receive additional information, clarification or support, please refer to SAP Consulting.

Any software coding and/or code lines / strings ("Code") included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended better explain and visualize the syntax and phrasing rules of certain coding. SAP does not warrant the correctness and completeness of the Code given herein, and SAP shall not be liable for errors or damages caused by the usage of the Code, except if such damages were caused by SAP intentionally or grossly negligent.

Disclaimer

Some components of this product are based on Java™. Any code change in these components may cause unpredictable and severe malfunctions and is therefore expressly prohibited, as is any decompilation of these components.

Any Java™ Source Code delivered with this product is only to be used by SAP's Support Services and may not be modified or altered in any way.

Document History

Document Version	Description
1.00	Initial Version
1.01	Update VPN configuration
1.02	Adding the new CAL BW/4 Image
1.03	Adding sapserv#/SLD setup
1.04	Adding BW/4 1.0 CAL Image
1.10	Complete SAC Connectivity Scenario, Further Updates for SIP/CIP
1.15	Updates 06/2018, CORS with 7.52
1.17	Updates 02/2019 CORS and SAC
1.20	Adding XSa access
1.21	Adding BW/4 2.0 CAL Image
1.22	Adding additional SAP Cloud Options
1.25	Update Q2/2020
1.30	Updates SAP HANA access, SAP Gateway, DWC and SAC Integration
1.35	Update Q1/2021, Completely revised Chapter 6.6 SAPCC
1.40	Update Q4/2021, SSL Additions
1.41	Review Q4/2021
1.42	SDI and SAC Updates 01.2022
1.45	Further Updates for SAP CC and CA 03.2022
1.46	Updates 08.2022

Typographic Conventions

Type Style	Description
<i>Example Text</i>	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Cross-references to other documentation
Example text	Emphasized words or phrases in body text, graphic titles, and table titles
Example text	File and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
Example text	User entry texts. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
EXAMPLE TEXT	Keys on the keyboard, for example, F2 or ENTER.

Icons





Icon	Description
	Caution
	Note or Important
	Example
	Recommendation or Tip

Table of Contents

1.	Introduction	1
2.	The Microsoft Azure Cloud.....	2
2.1	Create/Log on to the Azure Account	4
3.	Create the Virtual Machine for SAP BW/4HANA	6
3.1	Create the Jumpserver (Win64 based).....	6
3.1.1	DNS label/Public IP address	11
3.1.2	Network security group	12
3.1.3	Attach a data disk	13
3.1.4	Enable the Backup of the VM	15
3.1.5	Additional resources	15
3.2	Create the SAP BW/4HANA server (Linux64 based)	16
3.2.1	How to attach a data disk to a Linux VM.....	16
4.	using the CAL Version of BW/4HANA.....	19
4.1	Access the CAL BW/4 1.0 Image	23
4.1.1	Access the Azure Portal.....	23
4.1.2	Access the OS level	23
4.1.3	Access the SAP BW/4 system.....	24
4.1.4	Further post activities on the CAL Image	25
4.1.5	Troubleshooting.....	25
4.2	Access the BW/4 2.0 Image	27
4.2.1	Details of the CAL Image	27
4.2.2	Apply the latest SW stack.....	27
5.	Access the SAP BW/4HANA server	28
5.1	Access via SAP GUI 7.x.....	28
5.1.1	Avoid SAP GUI connection closed	29
5.1.2	SAP Gateway Parameter	29
5.2	Access via the SAP HANA Studio	30
5.2.1	Access via the SAP BW-MT	32
5.2.2	Access via OS level	34
5.2.3	Access the XSa Infrastructure	35
6.	Further Settings and Connectivity	36
6.1	Activate the Azure PowerShell	36
6.1.1	Useful Power Shell snippets	37
6.1.1.1	Logon via PowerShell	37
6.1.1.2	Change internal IP address	37
6.1.1.3	Add the CustomScriptExtension	37
6.2	Additional connectivity for the Cloud	39
6.2.1	Activate a customer DNS service	39
6.2.2	Configure a Site-to-Site connection.....	41

6.2.2.1	Create a virtual network.....	41
6.2.2.2	Specify a DNS server.....	42
6.2.2.3	Create the gateway subnet	43
6.2.2.4	Create the VPN gateway.....	43
6.2.2.5	Create the local network gateway	44
6.2.2.6	Configure your VPN device	46
6.2.2.7	Create the VPN connection.....	46
6.2.2.8	Verify the VPN connection	47
6.2.3	Connect the SAP system to sapservX	48
6.2.4	Connect Azure based System to local SLD/LMDB.....	49
6.3	smart data integration (SDI) with SAP HANA	50
6.3.1	SAP HANA deployed on premise.....	53
6.3.2	SAP HANA deployed in the cloud or behind a firewall	54
6.3.3	Components.....	54
6.4	nearline storage (NLS) with SAP HANA.....	54
6.5	BW/4 HANA and SAP Data Intelligence.....	55
6.6	SAP Analytics Cloud (SAC).....	56
6.6.1	Configuration SAPCP Cloud Connector	57
6.6.2	Configuration Analytics Cloud Agent.....	63
6.6.2.1	Tomcat 9.0 Installation.....	64
6.6.2.2	Enable SSL/TLS support on Tomcat 9.0	65
6.6.2.3	Adapt the configuration file on Tomcat 9.0	65
6.6.2.4	Deploy the Cloud Agent (WAR file)	67
6.6.2.5	Configure the Tomcat Service Admin User.....	68
6.6.2.6	Deploy the SAP JCo file.....	69
6.6.2.7	Configure the Access Control in the SAP HCC	69
6.6.3	Configuration of Reverse Proxy	70
6.6.4	Configuration of Cross-Origin Resource Sharing (CORS)	70
6.6.4.1	Check the TLS/SSL Settings	71
6.6.4.2	Check the Services GetResponse/GetServerInfo....	72
6.6.4.3	Configure the System Whitelist	73
6.6.4.4	Additional Background Information.....	76
6.6.5	Activate the SAML2 Provider	77
6.6.6	Connect to the SAC Application	82
6.7	SAP Cloud Platform Integration	85
6.7.1	SAP Cloud Foundry	86
6.7.2	Extend SAP S/4HANA with SAP and Microsoft services	87
6.7.3	SAP Data Warehouse Cloud (DWC).....	87
6.8	ODP based data extraction	88
6.8.1	ODP-Based Data Extraction via OData	88
6.8.2	ODP-Based Data Extraction via CDS views.....	88

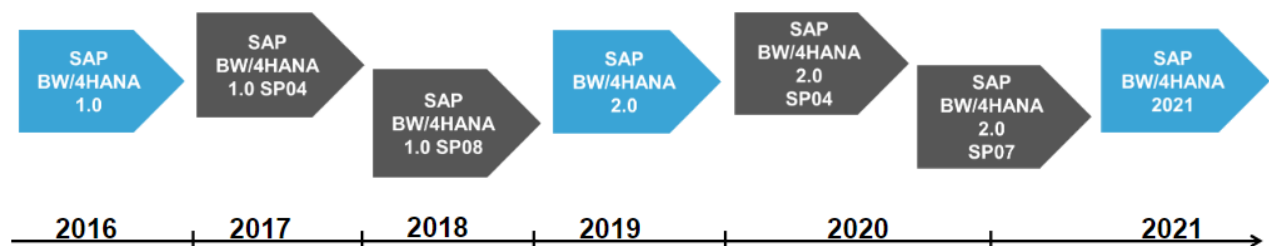
6.9 Integration with other Cloud Solutions89

- 6.9.1 General cloud classification and responsibilities.....89
- 6.9.2 SAP Integration Technologies..... 90
- 6.9.3 SuccessFactors 91
- 6.9.4 Concur.....92
- 6.9.5 Hybris93
- 6.9.6 Ariba95

1. Introduction

SAP BW/4HANA is a data warehouse solution which is highly optimized for the SAP HANA platform. It offers a managed approach to data warehousing. This means that prefabricated templates (building blocks) are offered for building a data warehouse in a standardized way. The use case illustrates how you can use your SAP BW/4HANA implementation. The main use case of SAP BW/4HANA is Data Warehousing.

SAP BW/4HANA provides you with a simplified Data Warehouse, with agile and flexible data modeling, SAP HANA-optimized processes and state of the art user interfaces. The core functionality of SAP BW is preserved. In SAP BW/4HANA, objects for data modeling, as well as processes and user interfaces, are especially primed for use with a SAP HANA database. Data modeling is restricted to the small number of objects that are well suited for modeling the layer architecture of a data warehouse on SAP HANA (LSA++). In SAP BW/4HANA, data warehouse models can be flexibly combined with SAP HANA views. An intuitive Eclipse-based modeling environment supports object modeling here.



To get a functional overview you can also refer to the latest Feature Presentation of SAP BW/4HANA - [Features BW/4HANA SP04 – Features BW/4 SP08 \(FP01\) – Roadmap BW/4 2.0 - What's new with SAP BW/4 2.0 SP04 – TechEd-2020 SAP Analytics Q/A Summary \(SAP DWC, SAC, BW4HANA\) – Day 1 – What's new with SAP BW/4HANA 2.0 SP07 – What's new with SAP BW/4HANA 2021](#)

Furthermore, as the Implementation of BW/4HANA not differs from the On-Premise Implementation, the existing [SAP First Guidance Document](#) will be used here as well.

And the BW/4HANA overview - [technical presentation about SAP BW/4HANA](#)

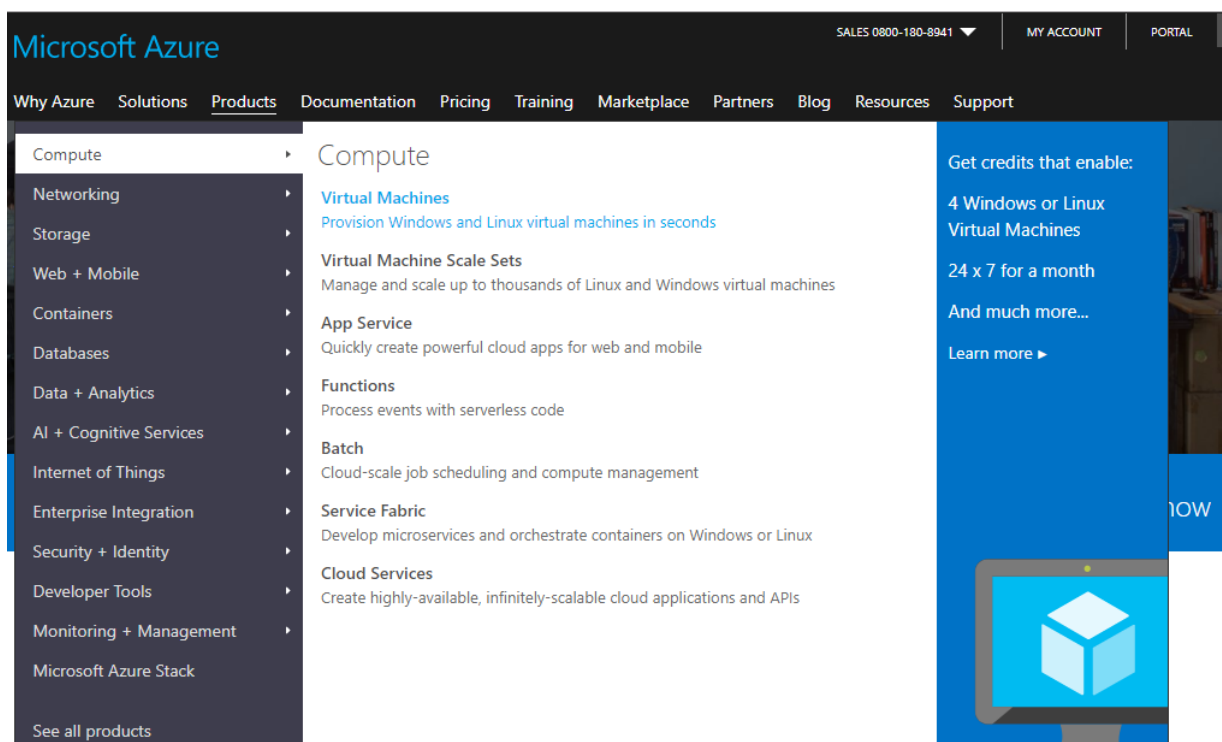
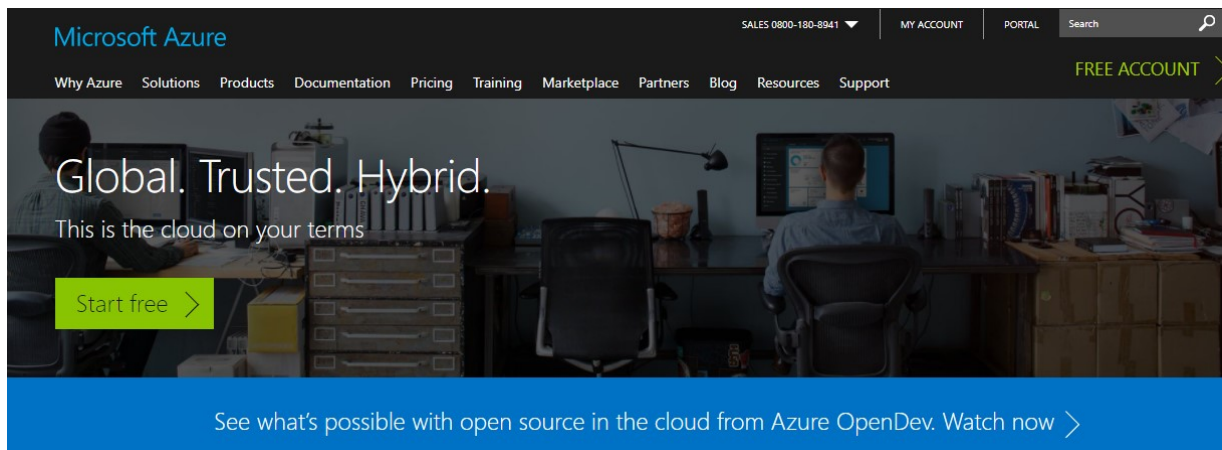
SAP Help - [Feature Scope Description - SAP BW/4HANA 2.0](#)

SAP Help - [Feature Scope Description - SAP BW/4HANA 2021](#)

2. The Microsoft Azure Cloud

The Azure Cloud provided by Microsoft can be used as well to implement SAP BW on HANA and SAP BW/4HANA Systems along with other SAP Products like S/4HANA

Log on with a Web Browser (Google Chrome suggested) to – <http://www.azure.com>



Make yourself familiar with the possible options, e.g. Virtual Machines, etc.
Visit the [Azure roadmap](#) to see what's new and what's coming next.

[SAP on Azure](#)

Azure Products

Browse our growing directory of integrated Azure services, features, and bundled suites. Visit the [Azure roadmap](#) to see what's new and what's coming next.

SAP

SAP HANA on Azure Large Instances

Run the largest SAP HANA workloads of any hyperscale cloud provider

SAP HANA on Azure Large Instances

A feature of [Virtual Machines](#)

Run the largest SAP HANA workloads of any hyperscale cloud provider

[Overview](#) | [Regions](#) | [Status](#) | [Portal](#)

Switch to the Azure Marketplace to discover more options to host SAP Applications

Azure Marketplace Browse Sell Learn

Products > SAP NetWeaver

SAP NetWeaver

SAP

The SAP NetWeaver technology platform enables the composition, and non-SAP applications across a heterogeneous software environ

Use Azure AD to manage user access and enable single sign-on with SAP NetWeaver. Re

[GET IT NOW](#)

Categories
Azure Active Directory apps

* Enterprise Single Sign-On - Azure Active Directory supports rich enterprise-class single sign in using their organizational accounts hosted in Active Directory.

* Easy Configuration - Azure Active Directory provides a simple step-by-step user interf

sap

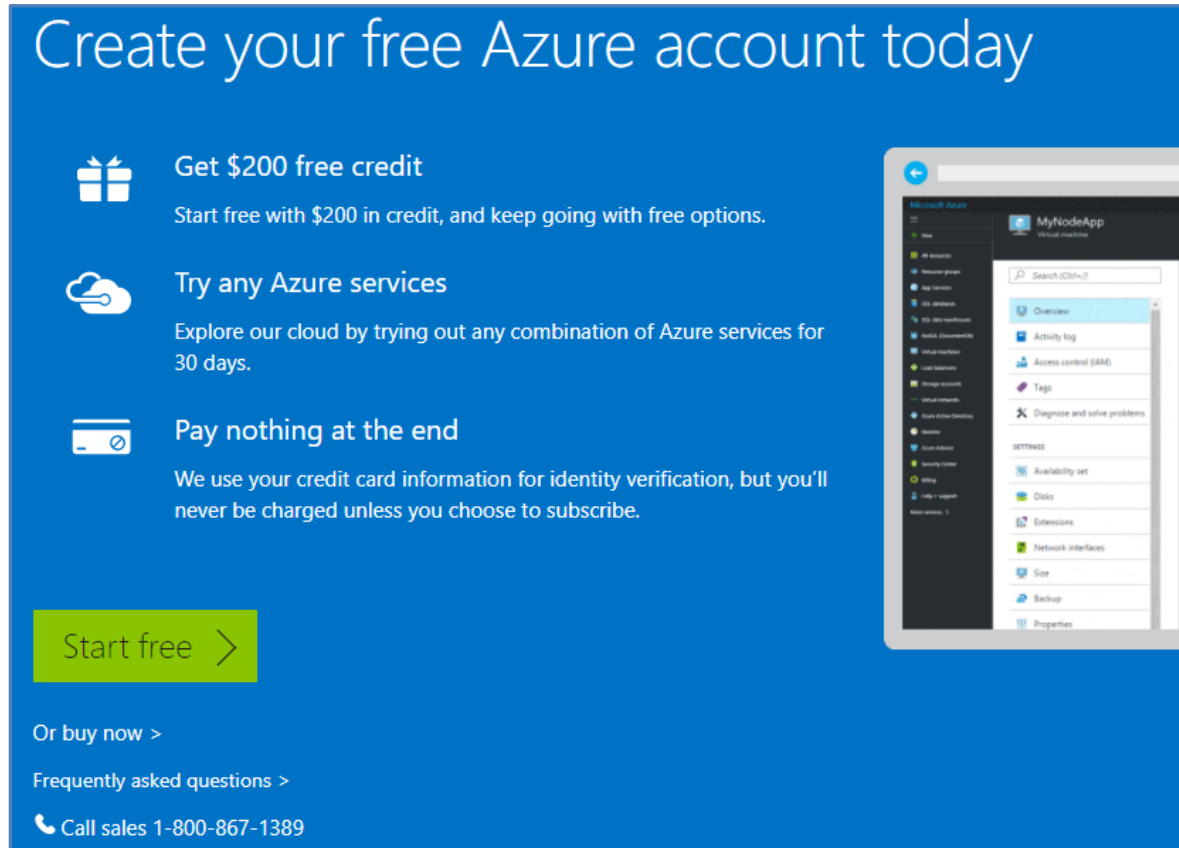
Search all apps for sap

Apps Search suggestions




- SAP BusinessObjects Cloud SAP
- SAP NetWeaver SAP
- SAP HANA SAP
- SAP HANA Cloud Platform SAP
- SAP Cloud for Customer SAP

2.1 Create/Log on to the Azure Account

Either log on with the “Start free” option or “buy now” option to create your Azure Account



Create your free Azure account today

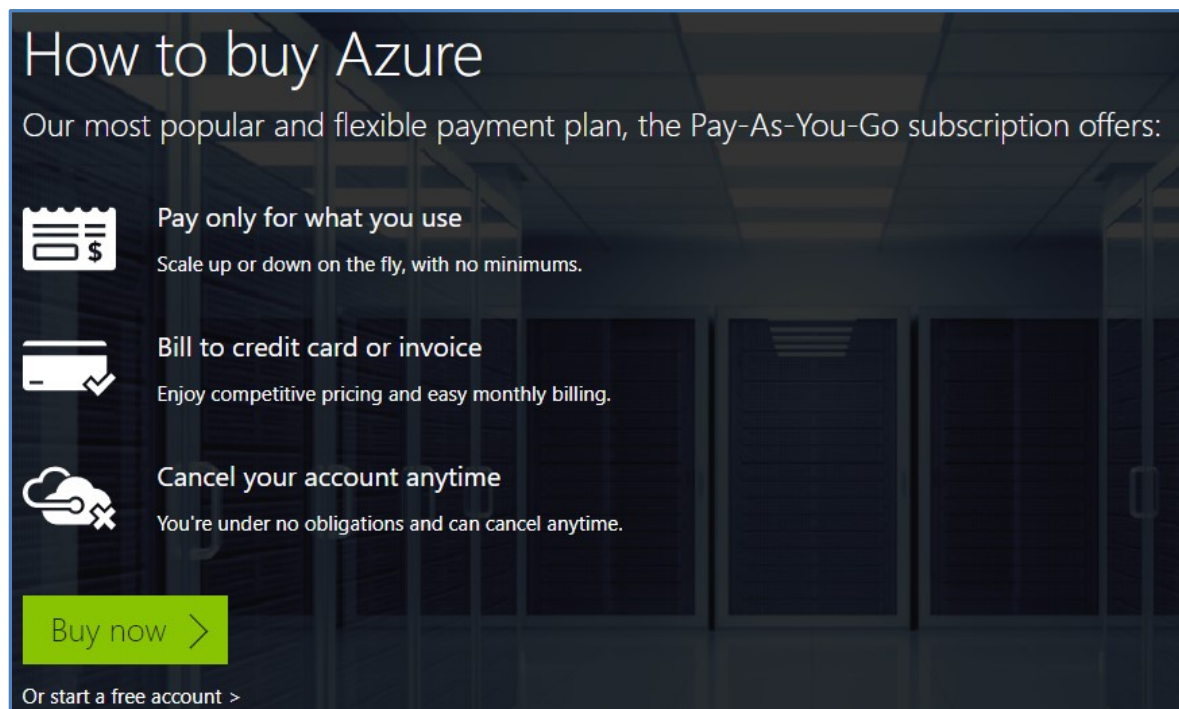
-  **Get \$200 free credit**
Start free with \$200 in credit, and keep going with free options.
-  **Try any Azure services**
Explore our cloud by trying out any combination of Azure services for 30 days.
-  **Pay nothing at the end**
We use your credit card information for identity verification, but you'll never be charged unless you choose to subscribe.

[Start free >](#)

[Or buy now >](#)




[Frequently asked questions >](#)

[Call sales 1-800-867-1389](#)



How to buy Azure

Our most popular and flexible payment plan, the Pay-As-You-Go subscription offers:

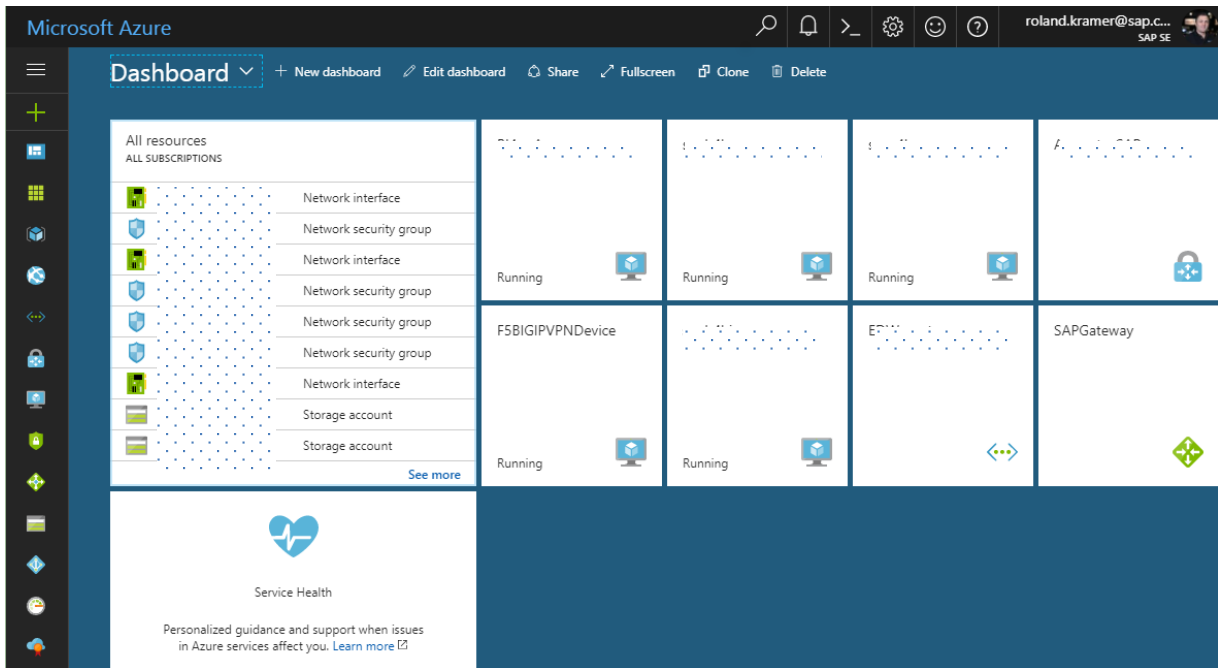
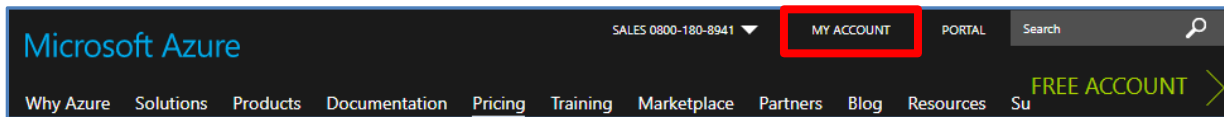
-  **Pay only for what you use**
Scale up or down on the fly, with no minimums.
-  **Bill to credit card or invoice**
Enjoy competitive pricing and easy monthly billing.
-  **Cancel your account anytime**
You're under no obligations and can cancel anytime.

[Buy now >](#)

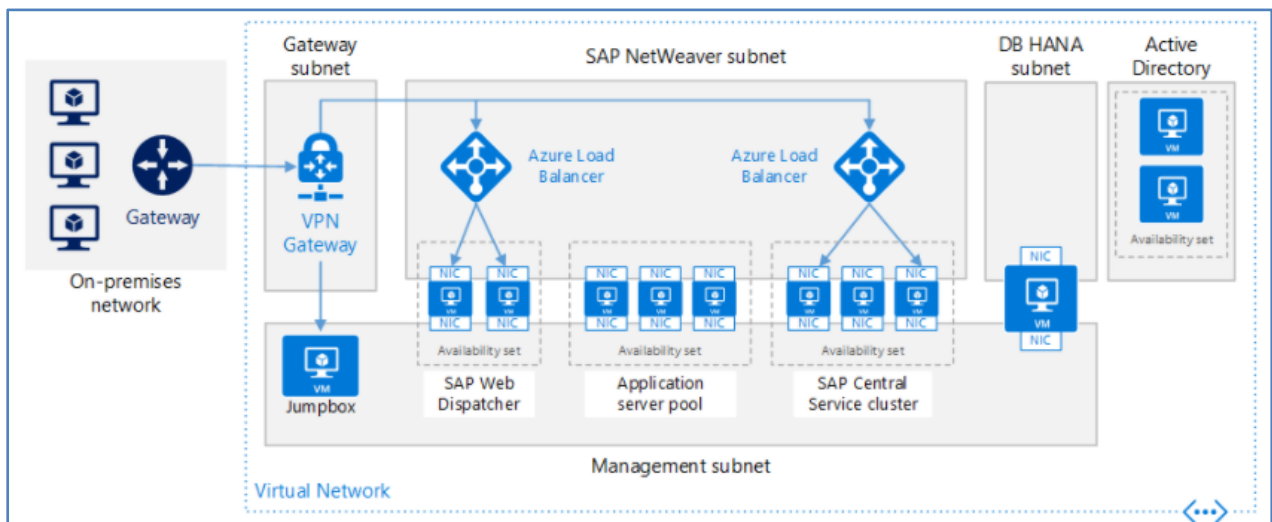
[Or start a free account >](#)

Once you created your Account, you can logon to the Azure Portal which will be the main entrance for all activities.

<https://azure.microsoft.com/en-us/account/>



Reference Architecture - [Deploy SAP NetWeaver and SAP HANA on Azure](#)



3. Create the Virtual Machine for SAP BW/4HANA

For all activities on the Azure Cloud with the Portal access there are detailed description to go forward. Even the whole usage is intuitive, it makes sense to consult the Help Pages if necessary.

It also makes sense to create a “Jumpserver” first, which can be used to download all necessary Software from the SAP Marketplace first and to access the SAP BW/4HANA System in the Azure Cloud environment via SAP GUI and the SAP BW modelling tools (BW-MT).

A short overview of the BW/4HANA concepts can be found in the [SAP First Guidance – complete functional scope \(CFS\) for SAP BW/4HANA](#)

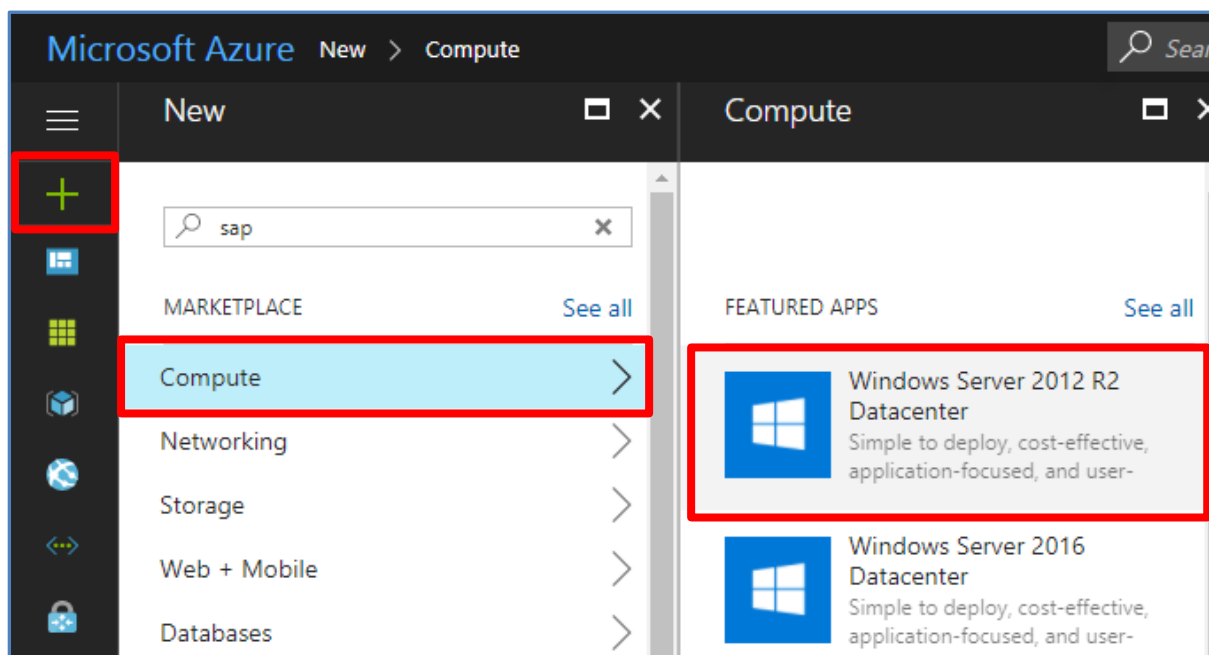
3.1 Create the Jumpserver (Win64 based)

Use the Azure Portal and create a Windows 201x Datacenter Instance.

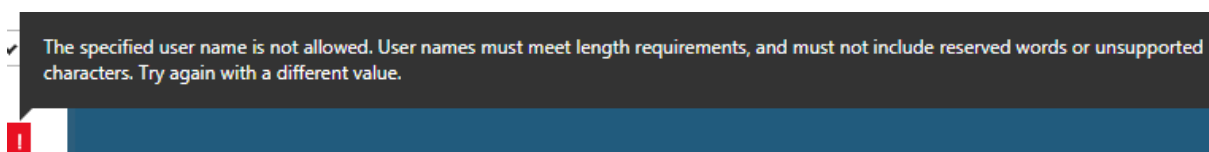
If necessary, this VM can be used later also for other services, e.g. an [own DNS service](#)

Microsoft Azure Step-by-Step Tutorial

<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/>



The VM creation wizard guides you through the complete Process. If the entries are not matching or not following the Azure standard, a pop-up will apply like below:



✓ Password must have 3 of the following: 1 lower case character, 1 upper case character, 1 number, and 1 special character that is not '\ ' or '-'.
 i

Create virtual machine
✕

1 Basics
Configure basic settings >

2 Size
Choose virtual machine size >

3 Settings
Configure optional features >

4 Summary
Windows Server 2012 R2 Datac... >

Basics

***** Name ✓

VM disk type ⓘ

***** User name ✓

***** Password ✓

***** Confirm password ✓

Subscription

***** Resource group ⓘ

Create new Use existing

Location

Save money
Save up to 40% with a license you already own.

***** Already have a Windows Server license? ⓘ

A suitable size would be “DS5_V2 Standard”. The Disk(s) will be added in a later step.

You can proceed here with the default settings. These settings will be explained here – [Create a Windows virtual machine with the Azure portal](#)

<ol style="list-style-type: none"> 1 Basics Done ✓ 2 Size Done ✓ 3 Settings Done ✓ <li style="background-color: #e1f5fe;">4 Summary Windows Server 2012 R2 Datacenter > 	<p>i Validation passed</p> <p>Basics</p> <p>Subscription Resource group Location West Europe</p> <p>Settings</p> <p>Computer name BW4onAzure Disk type SSD User name bw4onazure Size Standard DS5 v2 Managed Yes Virtual network (new) Subnet (new) Public IP address (new) Network security group (firewall) (new) Accelerated networking Disabled Availability set None Guest OS diagnostics Disabled Boot diagnostics Enabled Diagnostics storage account (new)</p>
--	---

Allow the Azure Infrastructure to create the VM. You can see the progress in the Azure Portal.

The screenshot shows the Azure Portal Dashboard with the following elements:

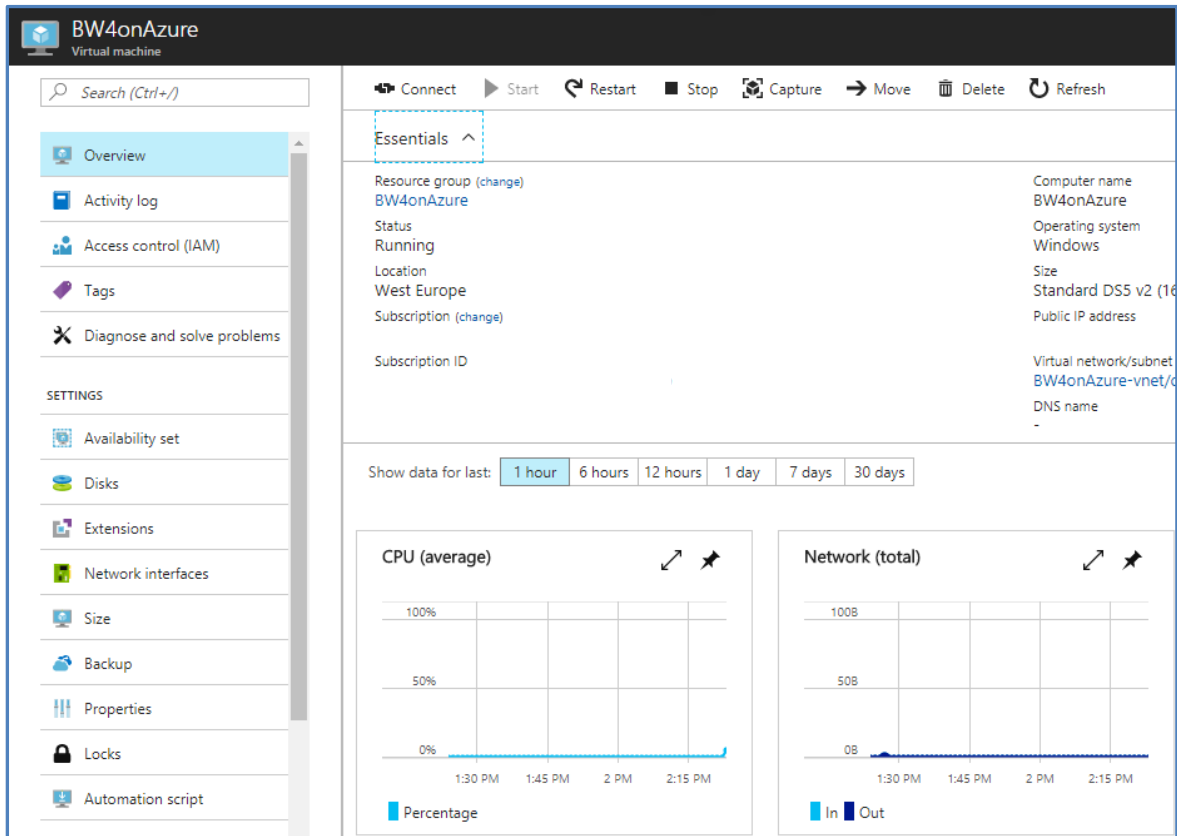
- Dashboard Header:** Includes navigation options like '+ New dashboard', 'Edit dashboard', 'Share', 'Fullscreen', 'Clone', and 'Delete'.
- All resources (ALL SUBSCRIPTIONS):** A list of resources including multiple Network interfaces, Network security groups, and Storage accounts. A 'See more' link is at the bottom.
- Deploying Windows Server 2012 R2 Datacenter:** A large blue tile with a progress indicator and a 'Running' status.
- F5BIGIPVPNDevice:** A white tile with a progress indicator and a 'Running' status.

Once your Windows VM is deployed you can check and modify the necessary details to access the machine from your local Network.

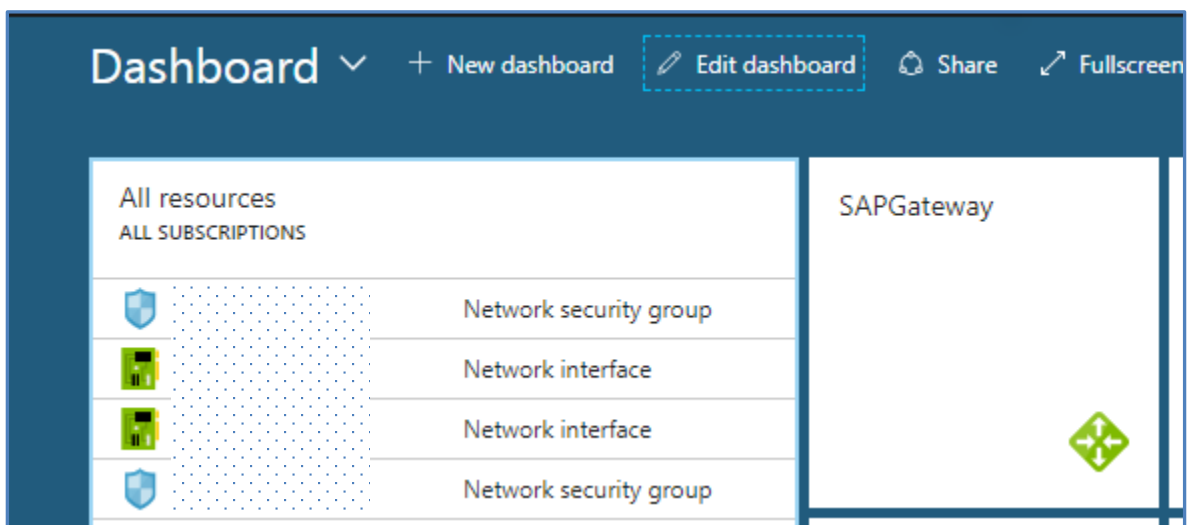
As there are many, many features to activate for the proper usage there are some essential settings which should be applied.

This is for example:

- Active the DNS name, Check/assign a Public IP Address
- Open/Modify access ports
- Add a disk (or several)
- Enable Backup
- etc.



To access the settings, you can use the “All resources” Tile in the left upper corner of the Portal.



All resources
SAP SE

+ Add Columns Refresh

Subscriptions: PI Analytics PM EMEA/APJ (CH)

Filter by name... All types All locations

46 items

NAME	TYPE	RESOURCE GROUP	LOCATION
	Network interface	BW4	West Europe
	Storage account	BW4	West Europe
	Public IP address	BW4	West Europe
	Network security group	BW4	West Europe
	Virtual network	BW4	West Europe
	Disk	BW4ONAZURE	West Europe

3.1.1 DNS label/Public IP address

The Entry "Public IP address" allows you to define a public DNS name. The external Domain is pre-defined

.westeurope.cloudapp.azure.com

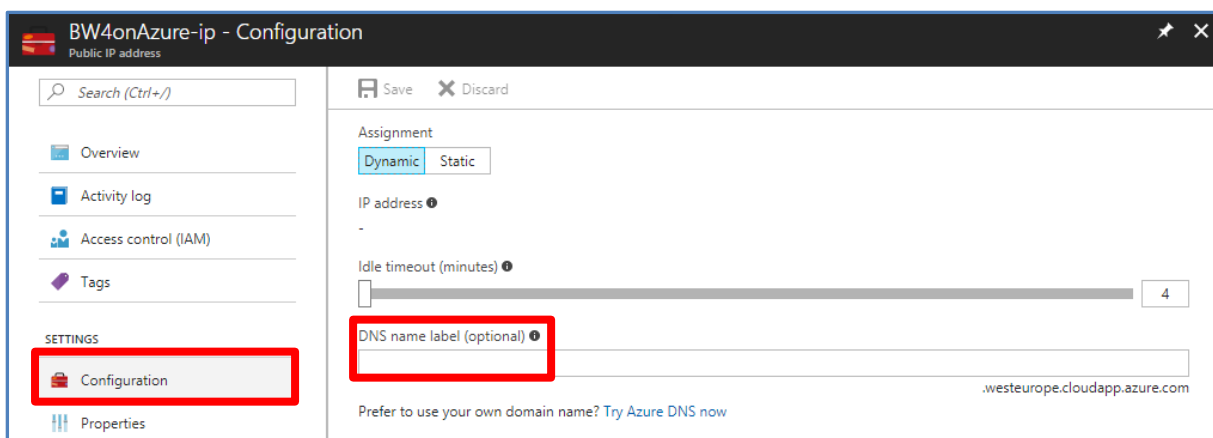
Microsoft Azure Help

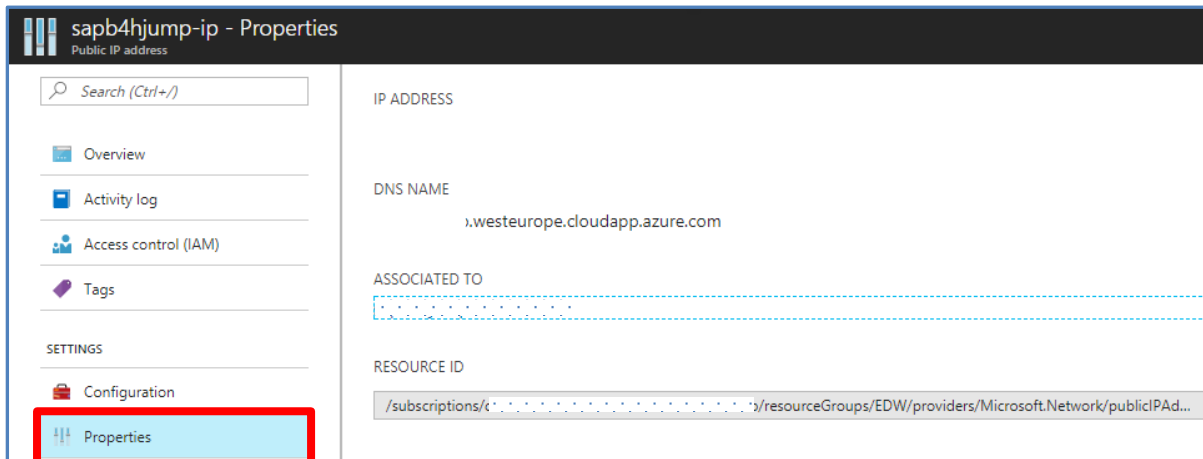
[User-defined routes and IP forwarding](#)

[Public IP addresses](#)

[Create your first virtual network](#)

[Name resolution for VMs and cloud services](#)



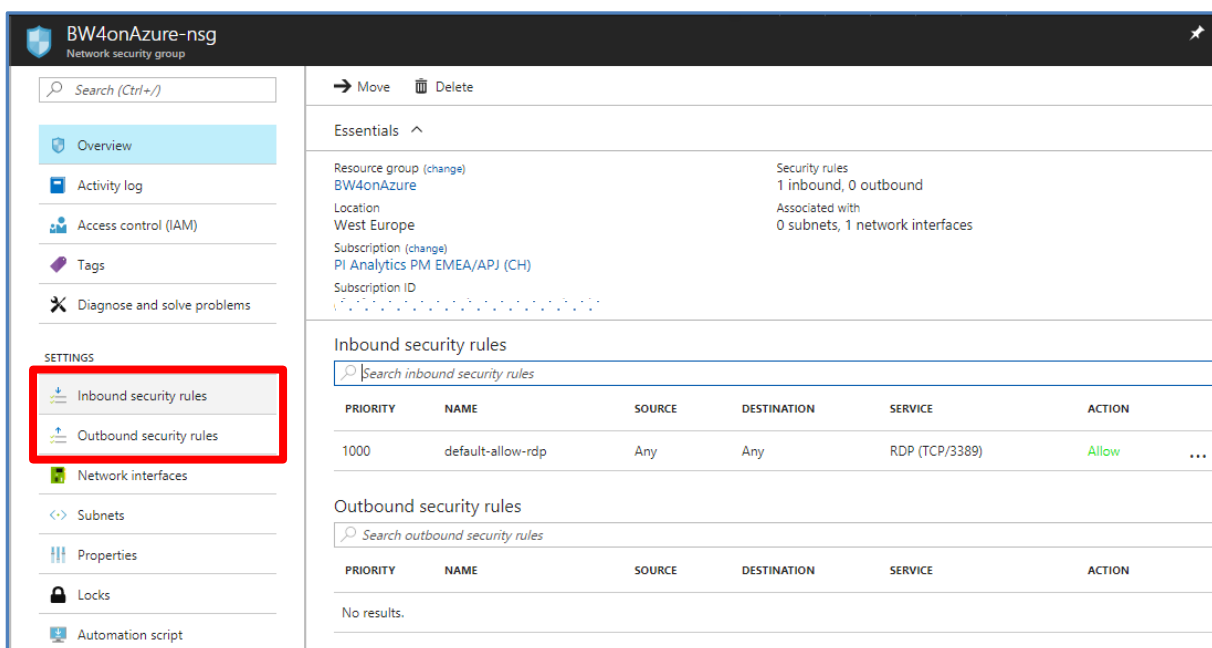
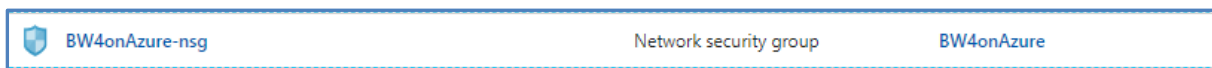


3.1.2 Network security group

The Entry "Network security group" allows you to define inbound/outbound port definitions for the access of the SAP Systems. By default, there is for example for Windows VM's only the RDP port for the mstsc.exe defined.

Manage NSGs using the Azure portal

<https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-create-nsg-arm-portal>



Depending on the needed services this list can be enhanced to your needs.

Inbound security rules

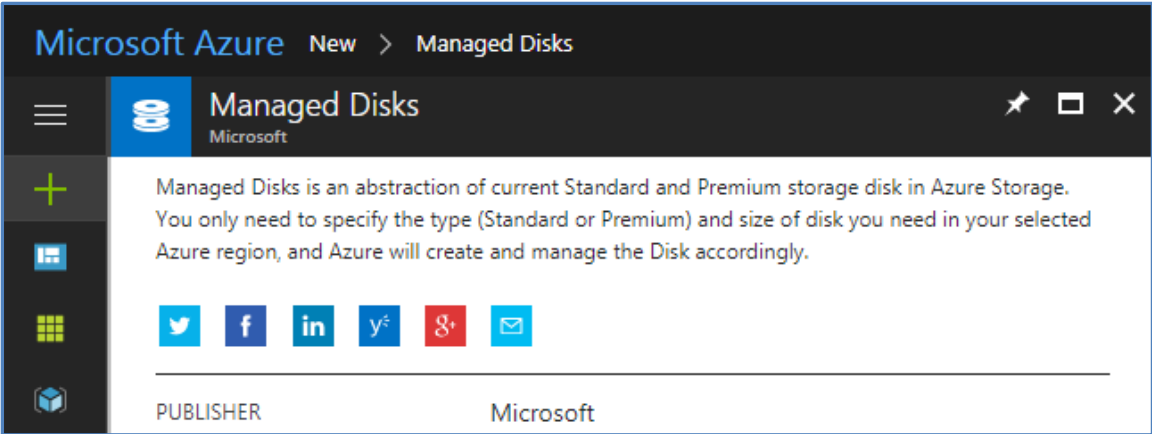
PRIORITY	NAME	SOURCE	DESTINATION	SERVICE	ACTION	
1000	default-allow-rdp	Any	Any	RDP (TCP/3389)	Allow	...
1010	Net_use_in	Any	Any	Custom (Any/445)	Allow	...
1020	dp_port_in	Any	Any	Custom (Any/3300-3390)	Allow	...
1030	gw_port_in	Any	Any	Custom (Any/3300-3390)	Allow	...
1040	ms_port_in	Any	Any	Custom (Any/3600-3699)	Allow	...
1050	mi_port_in	Any	Any	Custom (Any/3900-3999)	Allow	...

Outbound security rules

PRIORITY	NAME	SOURCE	DESTINATION	SERVICE	ACTION	
100	Net_use_out	Any	Any	Custom (Any/445)	Allow	...
110	dp_port_out	Any	Any	Custom (Any/3300-3399)	Allow	...
120	gw_port_out	Any	Any	Custom (Any/3300-3399)	Allow	...
130	ms_port_out	Any	Any	Custom (Any/3600-3699)	Allow	...
140	mi_port_out	Any	Any	Custom (Any/3900-3999)	Allow	...

3.1.3 Attach a data disk







To store data on the Windows VM, at least one data disk must be attached. The default disks only carry the OS, and a further disk allows only to store temporary data and will be erased and recreated as soon the VM will be restarted.



Microsoft Azure New > Managed Disks

Managed Disks
Microsoft

Managed Disks is an abstraction of current Standard and Premium storage disk in Azure Storage. You only need to specify the type (Standard or Premium) and size of disk you need in your selected Azure region, and Azure will create and manage the Disk accordingly.

PUBLISHER Microsoft

>Create

□ Create managed disk

*** Name**
 ✓

*** Subscription**

*** Resource group** ⓘ
 Create new Use existing
 ▼

*** Location**
 ▼

*** Account type** ⓘ
 ▼

*** Source type** ⓘ
 ▼

*** Size (GiB)** ⓘ
 ✓

Estimated performance ⓘ

IOPS limit	5000
Throughput limit (MB/s)	200

Pin to dashboard

CreateAutomation options

Microsoft Azure Help

[Create and manage VM disks](#)

Once the data disk is active, you must use the OS tools to activate the disk in the OS. Creating the data disk will not automatically attach the storage to the OS.

Click the start menu inside the VM and type `diskmgmt.msc` and hit Enter. This will start the Disk Management snap-in.

[How to attach a managed data disk to a Windows VM in the Azure portal](#)

<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/attach-managed-disk-portal>

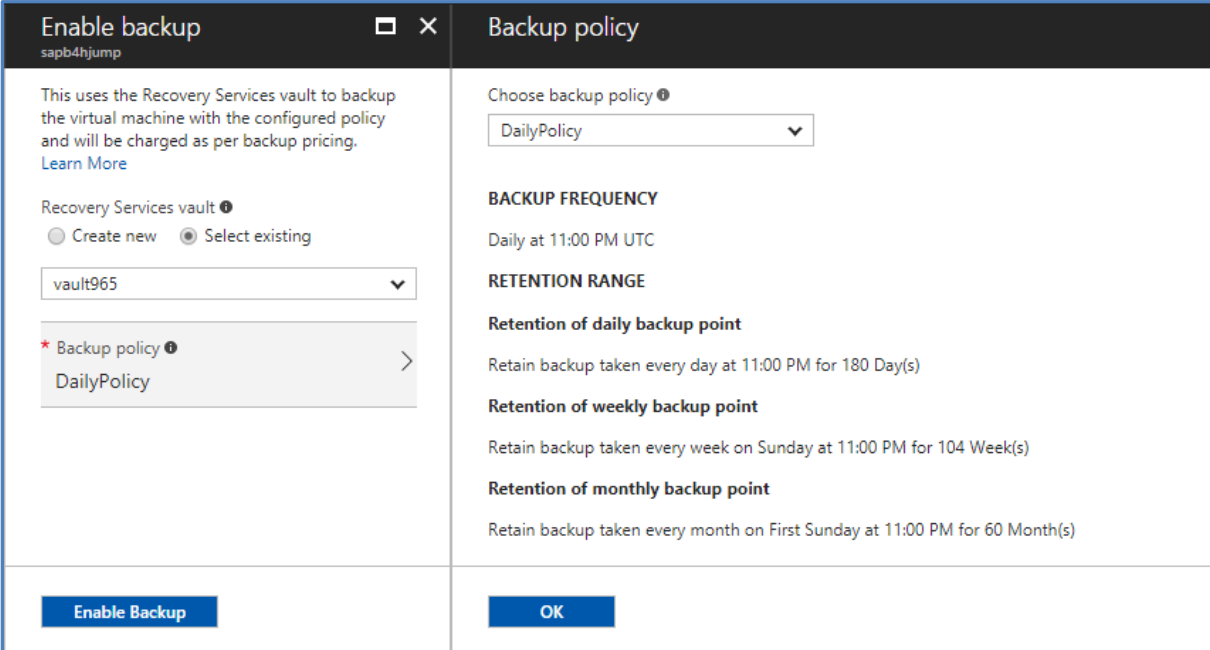
August 2022

14

3.1.4 Enable the Backup of the VM

[Microsoft Azure Help](#)

[Backup virtual machines](#)



Enable backup	Backup policy
<p>This uses the Recovery Services vault to backup the virtual machine with the configured policy and will be charged as per backup pricing. Learn More</p> <p>Recovery Services vault i</p> <p><input type="radio"/> Create new <input checked="" type="radio"/> Select existing</p> <p>vault965</p> <p>* Backup policy i</p> <p>DailyPolicy</p>	<p>Choose backup policy i</p> <p>DailyPolicy</p> <p>BACKUP FREQUENCY</p> <p>Daily at 11:00 PM UTC</p> <p>RETENTION RANGE</p> <p>Retention of daily backup point</p> <p>Retain backup taken every day at 11:00 PM for 180 Day(s)</p> <p>Retention of weekly backup point</p> <p>Retain backup taken every week on Sunday at 11:00 PM for 104 Week(s)</p> <p>Retention of monthly backup point</p> <p>Retain backup taken every month on First Sunday at 11:00 PM for 60 Month(s)</p>
<p>Enable Backup</p>	<p>OK</p>

3.1.5 Additional resources

[How to connect and log on to an Azure virtual machine running Windows](#)

[Using SAP on Azure Virtual Machines \(VMs\)](#)

3.2 Create the SAP BW/4HANA server (Linux64 based)

[SAP NetWeaver on Azure Virtual Machines \(VMs\) – Planning and Implementation Guide](#)

[QuickStart: Manual installation of single-instance SAP HANA on Azure VMs](#)

[Deploy SAP S/4HANA or BW/4HANA on Azure](#)

[Running SAP NetWeaver on Microsoft Azure SUSE Linux VMs](#)

[SAP HANA \(large instances\) overview and architecture on Azure](#)

These very detailed Blog explain the setup and implementation of BW/4HANA on Azure end-to-end.

However, it is mandatory to consult the SAP First Guidance Document - [SAP First Guidance – complete functional scope \(CFS\) for SAP BW/4HANA](#)

As the Implementation not differs for BW on or for HANA all concepts mentioned here can be considered <https://blogs.sap.com/2012/05/22/sap-bw-installationconfiguration-also-on-hana/>

3.2.1 How to attach a data disk to a Linux VM



[How to Attach a Data Disk to a Linux Virtual Machine](#)

Proceed as follows (details are mentioned on the Blog above):

ⓘ Azure now supports additional premium disk sizes: 32 GiB (P4), 64 GiB (P6), 2048 GiB (P40), and 4095 GiB (P60). Disks created before June 15, 2017 retain their existing performance and billing rates. [↗](#)

OS disk

NAME	SIZE	STORAGE ACCOUNT TYPE	ENCRYPTION	HOST CACHING
	30 GiB	Premium_LRS	Not enabled	Read/write

Data disks

LUN	NAME	SIZE	STORAGE ACCOUNT TYPE	ENCRYPTION	HOST CACHING
0	sapmnt	1023 GiB	Premium_LRS	Not enabled	Read/write
1	s4hdata01	1023 GiB	Premium_LRS	Not enabled	Read/write

+ Add data disk

Create a new (data) disk according to your VM OS from the Azure Portal

1. Use the `lsscsi` command to find out the device id.

```
sapserver02:~ # lsscsi -s (or fdisk -l)
```


2. The last entry shows the recent added data disk

```
[1:0:0:0]    disk    Msft    Virtual Disk    1.0    /dev/sdc    1.09TB
[1:0:0:1]    disk    Msft    Virtual Disk    1.0    /dev/sdd    2.19TB
```

Cd /usr/

3. Format the data disk now

```
sapserver02:~ #
```

```
Welcome to fdisk (util-linux 2.28).
```

```
Changes will remain in memory only, until you decide to write them.
```

```
Be careful before using the write command.
```

```
Command (m for help): n
```

```
Example for 1TB disk    p 1 2048 2145386495 w q
```

4. Create the file system on the new partition (use ext3 for SLES 11, and ext4 for SLES 12)

```
sapserver02:~ # mkfs -t ext4 /dev/sdd
```

5. Make a directory to mount the new file system, as follows

```
sapserver02:~ # mkdir /sapmnt
```

6. Finally, you can mount the drive, as follows:

```
sapserver02:~ # mount /dev/sdd /sapmnt
```

7. Add the new drive to /etc/fstab,

therefore locate the UUID for the new drive. Use the `blkid` command to find out the device id.

```
sapserver02:~ # blkid
```

```
/dev/sdc: UUID="e804571e-d137-46cc-a568-0b307fe86e18" BLOCK_SIZE="4096"
TYPE="ext4"
```

```
/dev/sdd: UUID="d831c1cd-4faa-42aa-84b7-cb2ad88de22f" BLOCK_SIZE="4096"
TYPE="ext4"
```

```
sapserver02:~ # vi /etc/fstab
```

```
/dev/disk/by-uuid/e804571e-d137-46cc-a568-0b307fe86e18 /usr/sap ext4
defaults,nofail 1 2
/dev/disk/by-uuid/d831c1cd-4faa-42aa-84b7-cb2ad88de22f /sapmnt ext4
defaults,nofail 1 2
```

```
sapserver02:~ # df -h
```

```
/dev/sdc    1007G   77M   956G   1% /usr/sap
/dev/sdd    2.0T    81M   1.9T   1% /sapmnt
```

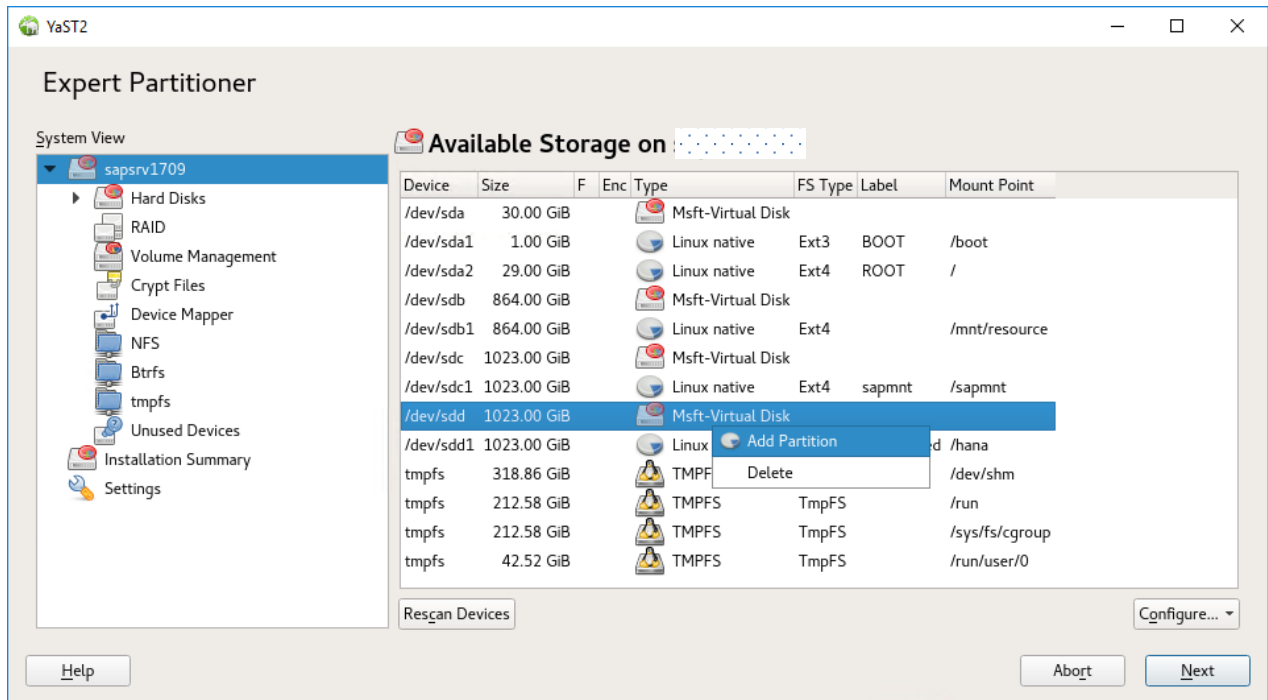
```
sapserver02:~ # mount -a
```

```
sapserver02:~ #
```

8. The new data disk is now attached to the existing VM



The online tool yast2 allows you to do the mentioned procedure in a graphical way all at once



If you cannot start the graphical X11 at this time, you have to install them with the scroll mode based yast tool first

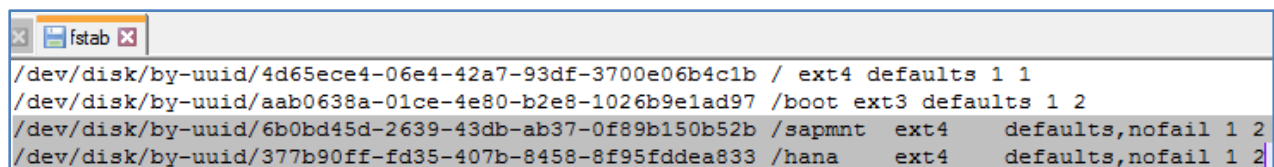
```
sapsrv02:~ # yast
```

```
yast2-control-center-qt
```

```
xorg-x11-xauth
```

```
xorg-x11-server-utils
```

However, you must check manually the correct entries in the file `/etc/fstab`



4. using the CAL Version of BW/4HANA

In the meantime, the initial Version of the BW/4HANA CAL (cloud application library) was updated to a more recent software stack.


Log on to the site <https://cal.sap.com> and select “SAP BW/4HANA SP05 ...” or higher

SAP Cloud Appliance Library		
Solutions : Filtered (11 of 103)	View: All Solutions	BW
SAP BW/4HANA 2.0 SP02 including SAP BW/4HANA Content 2.0 SP01 TRIAL SAP SE Oct 1, 2019	Google Cloud Platform, Microsoft Azure, Amazon Web Services	● Available
SAP Analytics Cloud: Data Connectivity and Authentication EDU SAP SE Aug 4, 2019	Amazon Web Services	● Available
SAP BW/4HANA 2.0 including SAP BW/4HANA Content 1.0 SP9 [Developer Edition] DEV SAP SE Jun 27, 2019	Google Cloud Platform, Microsoft Azure, Amazon Web Services	● Available
SAP BW/4HANA 2.0 SP0 including SAP BW/4HANA Content SP9 TRIAL SAP SE Apr 24, 2019	Google Cloud Platform, Microsoft Azure, Amazon Web Services	● Available

Solutions / Create Instance Calculate Cost

SAP BW/4HANA 2.0 SP02 including SAP BW/4HANA Content 2.0 SP01

This solution offers you an insight of SAP BW/4HANA 2.0. SAP BW/4HANA 2.0 is the next generation Data Warehouse optimized for HANA. Beside the BW/4HANA options the solution offers a bunch of HANA optimized BW/4HANA Content.


Publisher: SAP SE
● Available
[Show Related Instances](#)

Available In: Google Cloud Platform, Microsoft Azure, Amazon Web Services

[INFO](#) [RECOMMENDED VM SIZES](#) [RELATED ACCOUNTS](#)

Installed Products


SAP HANA Platform Edition 2.0

SAP BW/4HANA 2.0

Release Date: Oct 1, 2019
 Update: 10 (May 12, 2020, 12:45:30)

[Getting Started Guide](#) [Terms and Conditions](#)
[More Information](#) [Architecture Design](#)

Read and accept the Terms and Conditions ...

 The trial period for this solution will begin on the date you accept this Agreement.

Print

[I Accept](#) [I Decline](#)

Follow the procedure on the screen. Please note that there will a little fee purchased while using the Trial Version of BW/4HANA.

<
Basic Mode: Create Instance

Account Details

*Name:

Description:

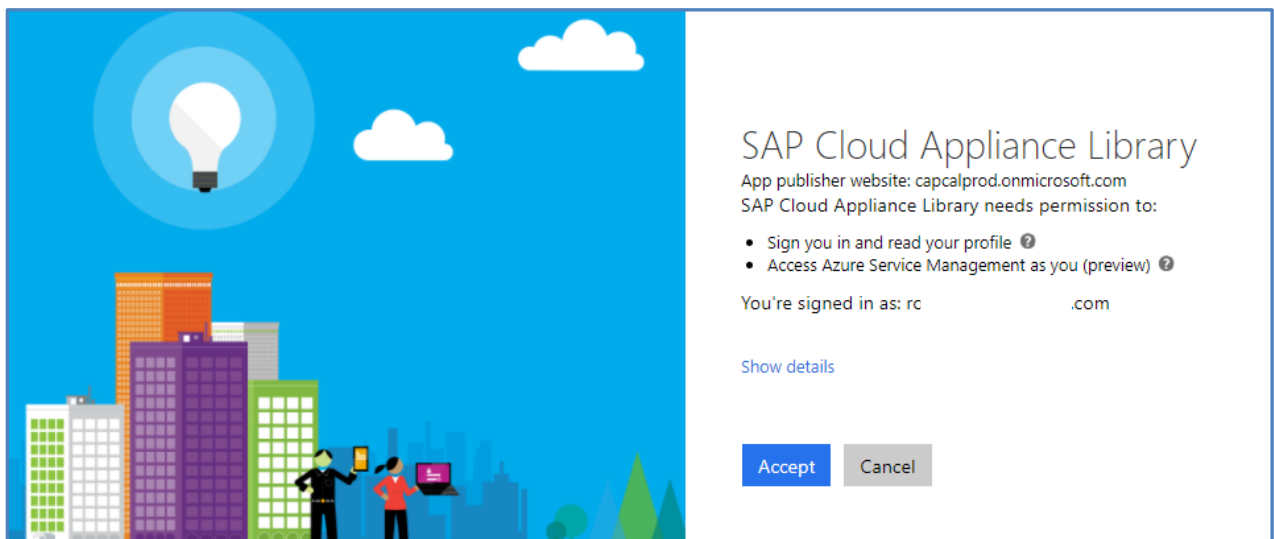
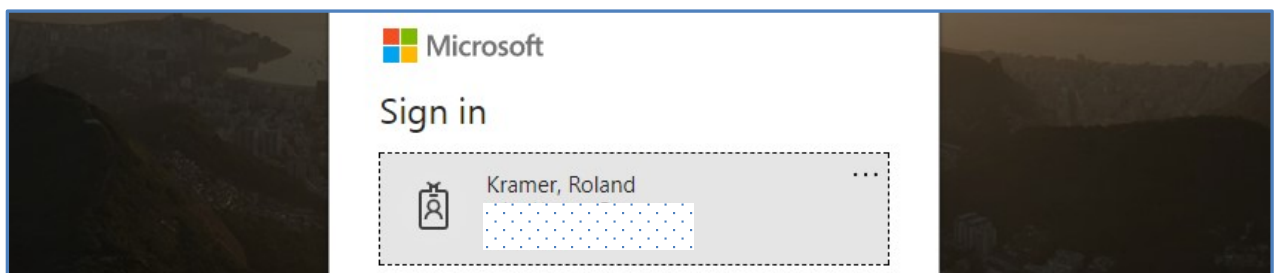
*Cloud Provider: ⚠️ ⓘ

*Subscription ID:

To establish the connection to Microsoft Azure, choose Authorize and grant permissions to SAP Cloud Appliance Library to access your Azure Active Directory.

Solution
SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT

Account
Roland Kramer
Microsoft Azure



You can combine an existing Azure Account with the Trial Version of SAP BW/HANA

<
Basic Mode: Create Instance
?

Account Details

Choose an existing account

Create a new account

*Name:

Description:

*Cloud Provider: ⚠ i

*Subscription ID:

To establish the connection to Microsoft Azure, choose Authorize and grant permissions to SAP Cloud Appliance Library to access your Azure Active Directory.

Instance Details

*Name:

Region: i

*Password:

*Retype Password:

Solution
SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT

Account
Roland Kramer
Microsoft Azure

Cost Forecast
[Disclaimer](#)
USD 0.77 per hour when Active
USD 7.49 per month when Suspended

⚠ Note that you will be charged by the cloud provider for this solution instance and its associated storage.

To reduce additional costs, your instance will be suspended after 8 hours.

Supported VM Sizes

Please be aware that the selected solution "**SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT**" is only fully supported on certified platforms which is not the case for the VM size **D13_v2** of the [Microsoft Azure](#) cloud provider.

Although the selected solution has been tested on this platform, support remains limited to [community support](#) even if an SAP Cloud Appliance Library subscription package is in place.

⚠ **Warning**

Wait until the solution instance is prepared to be used for the first time. This will take approximately 45 minutes. Please do not connect to the instance while it is being prepared.

Free Trial Restrictions

Note that according to the terms and conditions free trials must not be used for:

- Development, prototyping, proof of concepts, or sandbox environments
- Hosting a training course or a workshop with employees, partners, or customers
- Applying commercial license keys or uploading data for production use to the trial systems
- Demonstrations of software to prospective customers
- Benchmarking against competing third-party products

Instances : All (1)				
Name	Owned By	Created On	Scheduled	Status
BW/4HANA_Trial SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT	Roland Kramer	Aug 14, 2017, 11:17:10	No	Copying (68%)

Instances : All (1)				
Name	Owned By	Created On	Scheduled	Status
BW/4HANA_Trial SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT	Roland Kramer	Aug 14, 2017, 11:17:10	No	Prepared

Instances : All (1)				
Name	Owned By	Created On	Scheduled	Status
BW/4HANA_Trial SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT	Roland Kramer	Aug 14, 2017, 11:17:10	No	Activating

Once the Image is available, you can specify more details of the created Instance as follows.

Instances : All (1)					
Name	Owned By	Created On	Scheduled	Status	Operations
BW/4HANA_Trial SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT	Roland Kramer	Aug 14, 2017, 11:17:10	No	Activating	Edit ...

Instances / Save Cancel (?)

BW/4HANA_Trial

Owned By: Roland Kramer (1008817) Activating

Created On: Aug 14, 2017, 11:17:10

Next Suspend At: Aug 14, 2017, 19:08:25

Initial startup of the SAP solution takes approximately 45 minutes

Cost Forecast

[Disclaimer](#)

USD 0.77 per hour when Active

USD 7.49 per month when Suspended

[Edit Header](#)

INFO SOLUTION INFO VIRTUAL MACHINES SCHEDULE

Account: Roland Kramer	Region: West Europe (Netherlands)	<input checked="" type="checkbox"/> Public Static IP Address i IP Addresses	
Cloud Provider: Microsoft Azure	Network: SAPCALDefault-westeuropa	<input type="checkbox"/> Termination Protection	Linux Internal IP Address
	Subnet: default		Linux External IP Address

Virtual Machines

Name	Size	VM Status	Software Status
Linux	D13_v2 (8 cores, 56GB memory, HDD)	Active	Activating

4.1 Access the CAL BW/4 1.0 Image

Getting_Started_Guide_BW4HANASPO3_Trial_Vanilla

https://caldocs.hana.ondemand.com/caldocs/help/Getting_Started_Guide_BW4HANASPO3_Trial_Vanilla.pdf

Instances : All (1)		View: All Instances	Search	
Name	Owned By	Created On	Scheduled	Status
BW/4HANA_Trial SAP BW/4HANA SP03 including BW/4HANA Content SP01 XT	Roland Kramer (1008817)	Aug 14, 2017, 11:17:10	No	■ Active

4.1.1 Access the Azure Portal

Log on to the Azure Portal as describe in [Chapter](#) of this Document

4.1.2 Access the OS level

In case you want to access your backend instance on OS level, e.g. start/stop the SAP HANA and the SAP BW/4 system manually, you need an SSH client for your local environment, e.g. [PuTTY for Windows](#). For the graphical access, together with Putty, the [MobaXterm](#) package is suitable.

The following steps describe how to connect to your backend instance using PuTTY, but are similar for alternative SSH clients:

- Click on the instance name in your CAL account, to retrieve the IP of your backend instance and download the instance key pair (maybe you already downloaded the key pair during instance creation).
- Extract the private key of the key pair by using a tool like puttygen.exe.
- Open PuTTY and enter the IP of your backend instance.
- Navigate to the SSH > Auth node and enter your private key file.
- Navigate to the Connection > Data node and enter root as auto-login username.
- Save these session settings and hit the Open button. Now you can log in to your backend instance on OS level (SLES) for monitoring, troubleshooting, or accessing files on the server.

```

root@sid-aba-hdb:~
sid-aba-hdb:~ # df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda1       30G  2.2G  26G   8% /
devtmpfs        28G   8.0K  28G   1% /dev
tmpfs           42G    0  42G   0% /dev/shm
tmpfs           28G   9.9M  28G   1% /run
tmpfs           28G    0  28G   0% /sys/fs/cgroup
/dev/sde1       42G   18G  22G  46% /sapmnt/ABA
/dev/sdd1       79G   29G  46G  39% /hana/data/HDB
/dev/sdg1       35G   3.2G  30G  10% /hana/log/HDB
sid-aba-hdb:~ # du -h /hana/data/HDB
24G  /hana/data/HDB/mnt00001/hdb00002.00003
5.4G  /hana/data/HDB/mnt00001/hdb00001
29G  /hana/data/HDB/mnt00001
29G  /hana/data/HDB
sid-aba-hdb:~ #

```

The start/stop procedures are described in Chapter 5.2 of the [Getting Started Guide](#)

4.1.3 Access the SAP BW/4 system

Create the SAP Logon Details according the [Getting Started Guide](#) and the given Information of your Instance.

Additional Details for the access of the CAP Image in several ways is explained I the [Chapter 3.4](#)

Name	Value	Description
SID	ABA	System ID of the SAP system
CI Instance Number	00	The instance number of the central instance (CI)
CS Instance Number	01	The instance number of the central services (CS) instance.
Password	<master password>	The password set during instance creation.
Username	DDIC SAP*	These are the standard users which you can use to access the ABAP server.
Clients	000	000: Administration

Connection Type:

System Connection Parameters

Description:

Application Server:

Instance Number:

System ID:

SAProuter String:



After an Installation or a CAL based SAP system you will find two entries in the Instance Profile, which will prevent the procedure successfully to start the system. These settings are obsolete since SAP Kernel 7.40 and must be removed to continue the activation of the SAP Installation.

```
ipc/shm_psize_10 = 124000000
ipc/shm_psize_40 = 1668000000
```

You can use Putty (0.74) with the MobaXterm Solution as well. For details, how to use it, visit the URL <http://mobaxterm.mobatek.net/features.html>

MobaXterm also includes a SFTP access which allows you to modify the Instance profiles if necessary. Due to the new SAP Kernel 7.40 changes, only the following Parameters are necessary:

```
PHYS_MEMSIZE = 30%
abap/buffersize = 400000
```


4.1.4 Further post activities on the CAL Image



If you want to improve the stability and the functionality scope of the CAL BW/4 Image, please consult the SAP First Guidance Document -

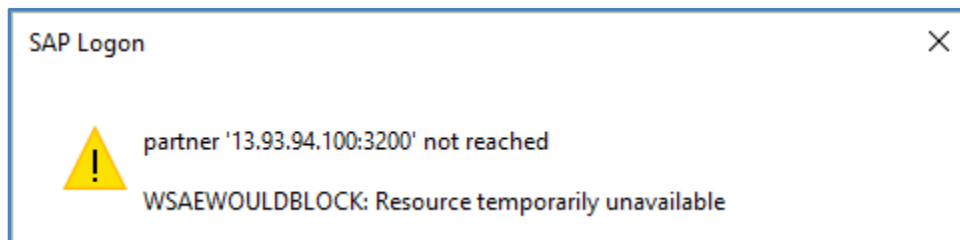
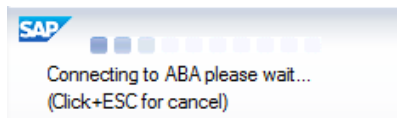
[SAP First Guidance – complete functional scope \(CFS\) for SAP BW/4HANA](#)

The CAL Image need the same post activities like for a new Installation not based on the CAL image to ensure a proper usage.

As the Implementation not differs for BW on or for HANA all concepts mentioned here can be considered <https://blogs.sap.com/2012/05/22/sap-bw-installationconfiguration-also-on-hana/>

4.1.5 Troubleshooting

The “classical” problem is the access to the SAP Instance via SAP GUI
10060: WSAETIMEDOUT: Connection timed out



You should consider the SAP CAL Wiki

<https://wiki.scn.sap.com/wiki/display/SAPCAL/SAP+Cloud+Appliance+Library+-+Troubleshooting>

In addition, you can test with the program “niping” the connection between the CAL image and your local frontend. Start the test as follows:

On the CAL Image OS → `niping -s -I 0`

On the frontend PC → `niping -c -H <ip-address> -S 3200 -B 1024 -L 10 -D 3`

If you get a timeout and your local firewall is blocking the SAP Ports like the dispatcher Port 32<nr>
SAP Help - [Configuring SSL for SAP Host Agent on UNIX](#)

```

*****
*
* ERROR      partner '1          00:3200' not reached
*
* TIME       Thu Aug 17 14:59:38 2017
* RELEASE    749
* COMPONENT  NI (network interface)
* VERSION    40
* RC         -10
* MODULE     D:/depot/bas/749_REL/src/base/ni/nixxi.cpp
* LINE       3428
* DETAIL     NiPConnect2: 1          00:3200
* SYSTEM CALL connect
* ERRNO      10060
* ERRNO TEXT WSAETIMEDOUT: Connection timed out
* COUNTER    2
*
*****

```

In addition, you can also check the availability of the SAP System with the following OS command (logged on as <sid>adm on the OS)

```
sid-aba-hdb:abaadm 55> sapcontrol -nr 00 -function GetProcessList
```

Finally, please make sure that at least one network security rule (NSG) is defined on the CAL image

Resource group (change) SAPCAL-	Security rules 2 inbound, 1 outbound					
Location West Europe	Associated with 0 subnets, 1 network interfaces					
Subscription (change) PI						
Subscription ID cf47f2						
Inbound security rules						
<input type="text" value="Search inbound security rules"/>						
PRIORITY	NAME	SOURCE	DESTINATION	SERVICE	ACTION	
1000	BW4HANATria-	0.0.0.0/0	Any	SSH (TCP/22)	Allow	...
1010	sapdp3200_in	Any	Any	Custom (Any/3200)	Allow	...
Outbound security rules						
<input type="text" value="Search outbound security rules"/>						
PRIORITY	NAME	SOURCE	DESTINATION	SERVICE	ACTION	
100	sapdp3200	Any	Any	Custom (Any/3200)	Allow	...

The inbound rule for the sap dispatcher port is optional, depending on your scenario.

4.2 Access the BW/4 2.0 Image

Basically, you can follow the description from [Chapter 4.1](#) and follows

4.2.1 Details of the CAL Image

https://cal.sap.com/console/tenant_NXDVO35VQX95#/solutions/8845c0f3-6e9c-4030-87bb-e4f8891567c5

Getting Started Guide

https://caldocs.hana.ondemand.com/caldocs/help/e45806f8-a19c-4d32-bee1-00d7d7501ef8_Getting_Started_Guide_v10.pdf

Blog

<https://blogs.sap.com/2019/04/28/sap-bw4-2.0-cal-for-it-.../>

4.2.2 Apply the latest SW stack

Go the [Maintenance Planer](#) and update to the latest Components (also the latest 7.77 Kernel):

- SAP BW/4 2.0 SP10
- SAP Application Server 7.53 SP04
- SAP UI 7.54 SP08
- BW/4 Content T/B SP09
- BPC 11.1 SP08
- BCS/4 2.0 SP08

Installed Software Component Versions		Installed Product Versions		
Component	Release	SP-Level	Support Package	Short Description of Component
SAP_BASIS	753	0007	SAPK-75307INSAPBASIS	SAP Basis Component
SAP_ABA	75D	0007	SAPK-75D07INSAPABA	Cross-Application Component
SAP_GWFND	753	0007	SAPK-75307INSAPGWFND	SAP Gateway Foundation
SAP_UI	754	0008	SAPK-75408INSAPUI	User Interface Technology
ST-PI	740	0016	SAPK-74016INSTPI	SAP Solution Tools Plug-In
BW4CONT	200	0009	SAPK-20009INBW4CONT	SAP BW4 HANA Content Addon
BW4CONTB	200	0009	SAPK-20009INBW4CONTB	SAP BW4 HANA Content Basis Addon
DW4CORE	200	0010	SAPK-20010INDW4CORE	DATA Warehouse
UIBAS001	400	0007	SAPK-40007INUIBAS001	UI for Basis Applications
BCS4HANA	200	0008	SAPK-20008INBCS4HANA	SAP BCS/4HANA 2.0
BPC4HANA	200	0008	SAPK-20008INBPC4HANA	BPC/4HANA

Installed Software Component Versions		Installed Product Versions		
Product	Release	SP Stack	Vendor	Short Description of Product Version
BPC4HANA	200	08 (08/2021)	sap.com	SAP BPC 11.1, FOR SAP BW/4HANA
SAP BCS FOR SAP BW/4HANA	200	SPS 08 (09/2021)	sap.com	SAP BCS 2.0 FOR SAP BW/4HANA
SAP_PERFORMANCE_MANAGEMENT	3.0	14 (06/2021)	sap.com	PROFITAB. AND PERFORM.MGMT 3.0
BW4HANA	200	SP9 (08/2021)	sap.com	SAP BW/4HANA 2.0

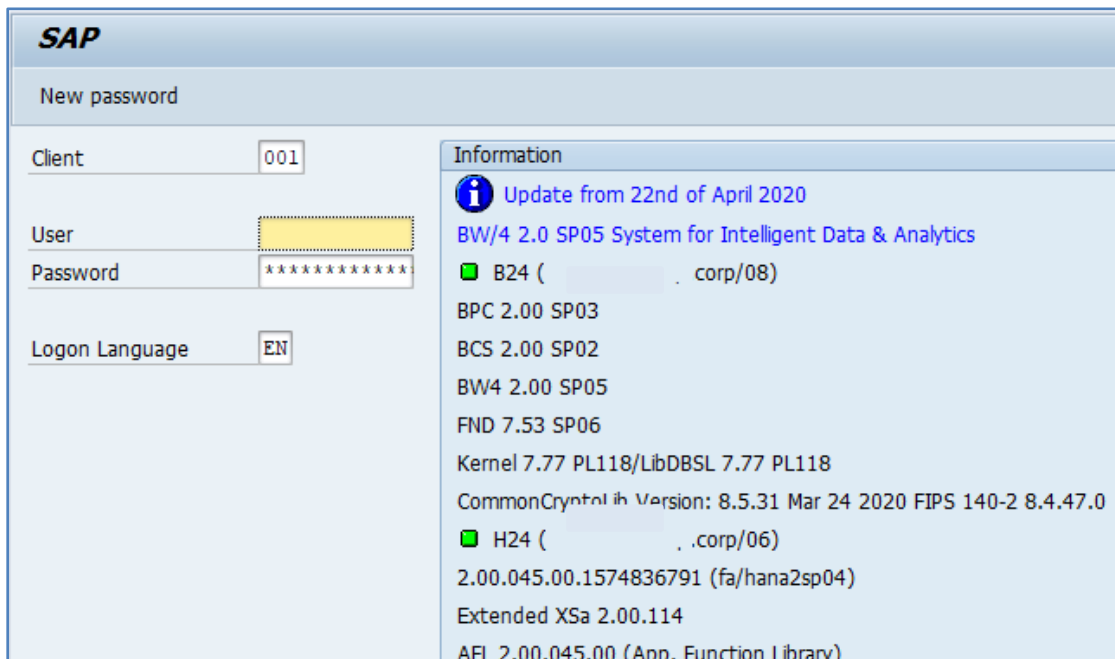
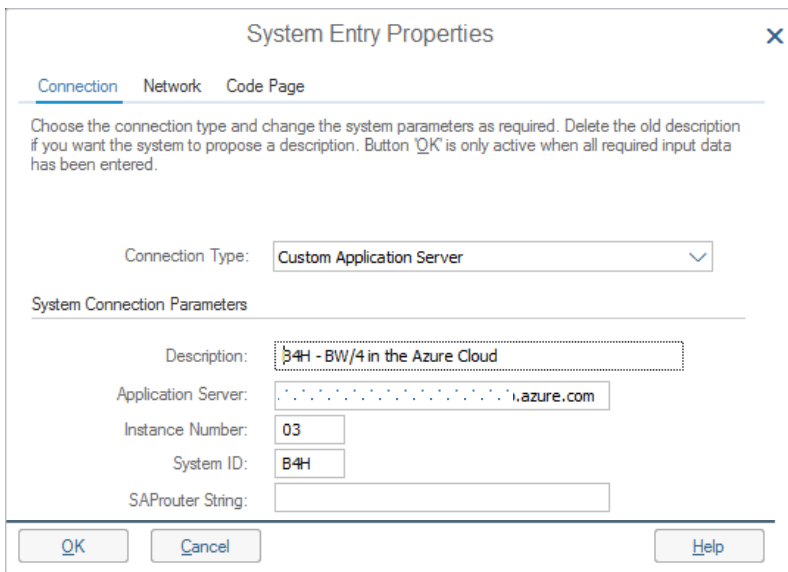
5. Access the SAP BW/4HANA server

To access the BW/4HANA server either via the Jump server which was created in [Chapter 1.2.1](#) or if you modified the [Network security groups](#) directly from your Desktop.

Depending on your Network and Firewall settings there is nothing else to do.

5.1 Access via SAP GUI 7.x

Simply add system with the public DNS and further settings for Instance Number and System ID in the SAP Logon Pad.



5.1.1 Avoid SAP GUI connection closed

Add the following Parameter to the Instance Profile and restart the system.

- `rdisp/keepalive_timeout = 3600`
- `rdisp/keepalive = 20`
- `rfc/use_gwstart = 1`
- `gw/cpic_timeout = 1800`
- `gw/frag_timeout = 1800`

More information can be found here -

[SAP GUI connection closed when connecting to SAP system in Azure](#)

SAP Help - [TCP Port of all SAP Products](#)

5.1.2 SAP Gateway Parameter

Add the following Parameter to the Instance/Default Profile and restart the system.

There are several additional Gateway Parameters needed to ensure a proper and stable connectivity of the SAP Gateway with the SAP S/4 Backend.

Please Note that Fixes for the SAP Gateway Service are delivered with the SAP Kernel.

- `gw/acl_mode = 1`
- `gw/accept_timeout = 60`
- `gw/activate_keyword_internal = 1`
- `gw/alternative_hostnames = server1, server2, ip-address1, ip-address2`
- `gw/convid_tbl_entries = 200000`
- `gw/gw_disconnect = 0`
- `gw/internal_port = 3408`
- `gw/max_overflow_size = 250000000`
- `gw/reg_no_conn_info = 129`
- `gw/resolve_phys_addr = 0`
- `gw/sim_mode = 1`
- `gw/stat = 1`
- `gw/reg_info = (DIR_DATA) (DIR_SEP) $(FN_REG_INFO)`
- `gw/sec_info = (DIR_DATA) (DIR_SEP) $(FN_SEC_INFO)`
- `gw/prxy_info = (DIR_DATA) (DIR_SEP) $(FN_PRXY_INFO)`
- `rfc/use_gwstart = 1`
- `rsdb/ssfs_connect = 1`
- `system/secure_communication = ON`
- `service/protectedwebmethods = SDEFAULT`

[Note 1444282 - gw/reg_no_conn_info settings](#)

[Note 1760329 - SAP in NAT \(Network Address Translation\) environment](#)

[Note 1794837 - Gateway core in GwDelConn](#)

[Note 2253115 - JCO RFC server threads are in \[DOWN\] state in SLD](#)

[Note 2464128 - You cannot use the gateway as proxy for this connection](#)

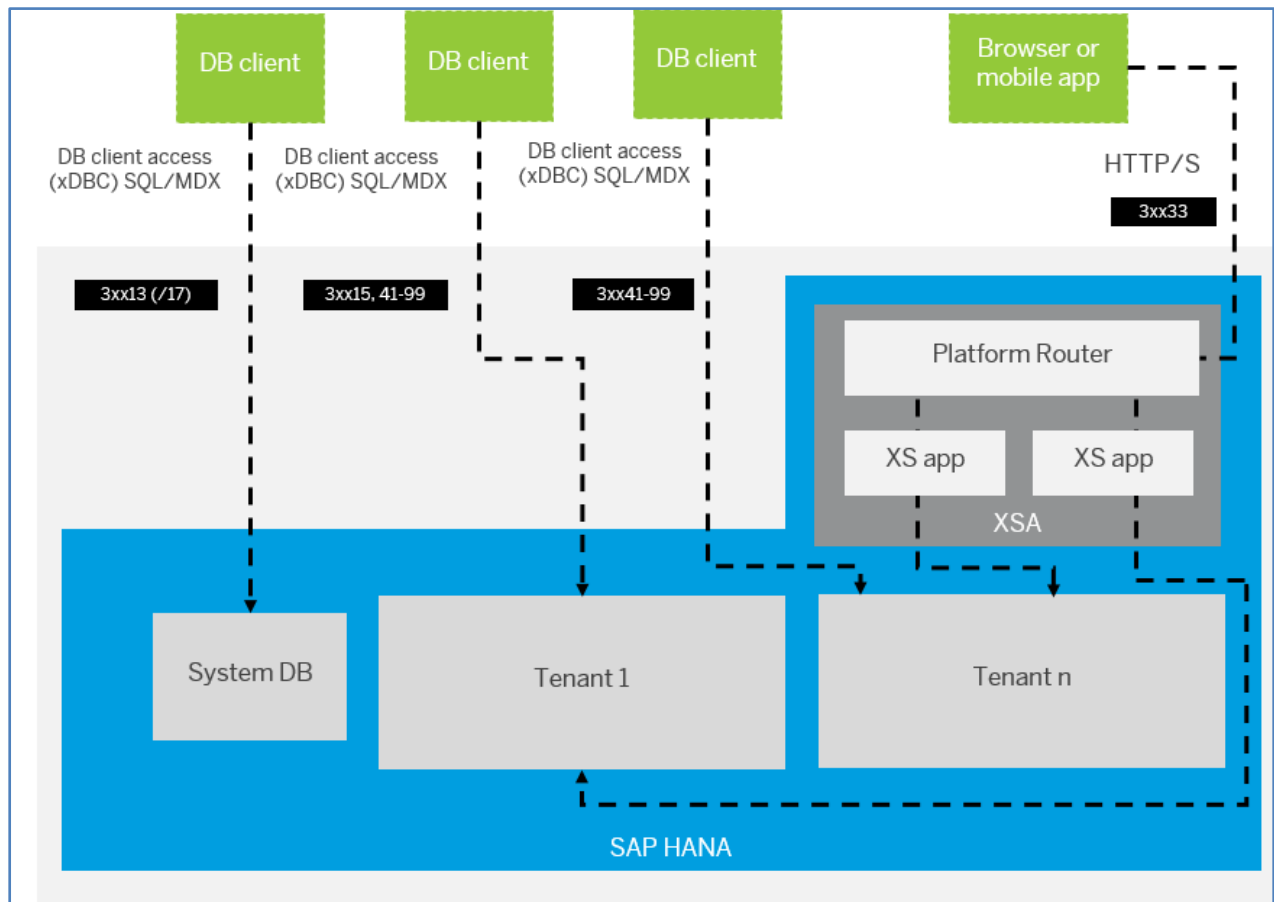
[Note 2875069 - GW: delayed SSL port availability after instance startup](#)

5.2 Access via the SAP HANA Studio

SAP Help - [Connections for Tenant Databases](#)

SAP Help - [Communication Channels](#)

[Note 2101244 - FAQ: SAP HANA Multitenant Database Containers \(MDC\)](#)



The default port number range for tenant databases is $3<instance>40 - 3<instance>99$. This means that the maximum number of tenant databases that can be created per instance is 20. However, you can increase this by reserving the port numbers of further instances. In the cockpit, a dialog will prompt you to do this, or you can configure the property `[multidb] reserved_instance_numbers` in the `global.ini` file. The default value of this property is 0. If you change the value to 1, the port numbers of one further instance are available (for example, 30040 - 30199 if the first instance is 00). If you change it to 2, the port numbers of two further instances are available (for example, 30040 - 30299 if the first instance is 00). And so on.

Add the following Parameter to the Default Profile of the SAP HANA and restart.

```
SAPGLOBALHOST = <server>
SAPLOCALHOST = <server>
SAPDBHOST = <server>
SAPFQDN = <domain>.azure.com
SAPLOCALHOSTFULL = $(SAPLOCALHOST).$(SAPFQDN)
```

SAP HANA is set to use the IP instead of the Full Qualified Domain Name by default. This is unsuitable in Hyperscaler Environments where you have internal and public FQDN and IP addresses.

- alter system alter configuration('global.ini','system') set ('public_hostname_resolution=fqdn') with reconfigure
- alter system alter configuration('global.ini','system') set ('public_hostname_resolution','map_<server>')='<server>.<domain>.azure.com' with reconfigure

Name	Default	System	Database - H4B	Host - sap
global.ini		◆	◆	◆
internal_hostname_resolution				◆
10. .4				● sap .net
public_hostname_resolution		◆	◆	◆
40. .82				● sap .azure.com
map_sap_...				● sapl .azure.com
use_default_route	ip	● fqdn	● fqdn	● fqdn
system_landscape_hostname_resolution				
system_replication_hostname_resolution				
multidb.ini				=
readonly_parameters				=
global.ini/system_replication_hostname_resolution *				=

Furthermore, create a logical link from the SAP HANA Instance Directory to the sec directory, identically as the already existing exe link.

```
h4badm@server:/usr/sap/H4B/HDB01>ln -s sec /usr/sap/H4B/HDB01/<server>/sec
```

```
h4sadm@sap :/usr/sap/H4S/HDB01> dir
total 64
drwxrwx--x 4 h4sadm sapsys 4096 Apr 21 2017 backup
lrwxrwxrwx 1 h4sadm sapsys 22 Apr 21 2017 exe -> ../exe/linuxx86_64/hdb
-r-xr-xr-x 1 h4sadm sapsys 13573 Oct 26 22:40 HDB
-r-xr-xr-x 1 h4sadm sapsys 538 Oct 26 22:40 HDBAdmin.sh
-r-xr-xr-x 1 h4sadm sapsys 6999 Oct 26 22:40 hdbenv.csh
-r-xr-xr-x 1 h4sadm sapsys 10828 Oct 26 22:40 hdbenv.sh
-r-xr-xr-x 1 h4sadm sapsys 1902 Oct 26 22:40 HDBSettings.csh
-r-xr-xr-x 1 h4sadm sapsys 2698 Oct 26 22:40 HDBSettings.sh
drwxr-x--- 9 h4sadm sapsys 4096 Oct 26 22:41 saps
lrwxrwxrwx 1 h4sadm sapsys 32 Oct 26 11:38 sec -> /usr/sap/H4S/HDB01/sap /sec
drwxr-x--- 5 h4sadm sapsys 4096 Jan 16 2020 work
-r-xr-xr-x 1 h4sadm sapsys 3714 Oct 26 22:40 xterms
```

[Note 2475246 - How to configure HANA DB connections using SSL from ABAP instance](#)

[Note 2621464 - SAP BW and HANA connection hanging](#)

[Note 2843930 - AppServers can't connect to HANA Database using encryption using \\$\(SECUDIR\)](#)

[Note 2846403 - Establishing an Encrypted Communication Fails on Client With "ERROR Connection failed \[...\] Cannot create SSL context: \[...\] The PSE file does not exist"](#)

[Note 2919754 - In-Database SSL/TLS Certificate Management for Specific Host Names Still Requires the Default PSE Store in File sapsrv.pse](#)

5.2.1 Access via the SAP BW-MT

Implement the BW-MT according the [SAP First Guidance – Implementing BW-MT as the new SAP BW Modeling Experience](#) if not already done.

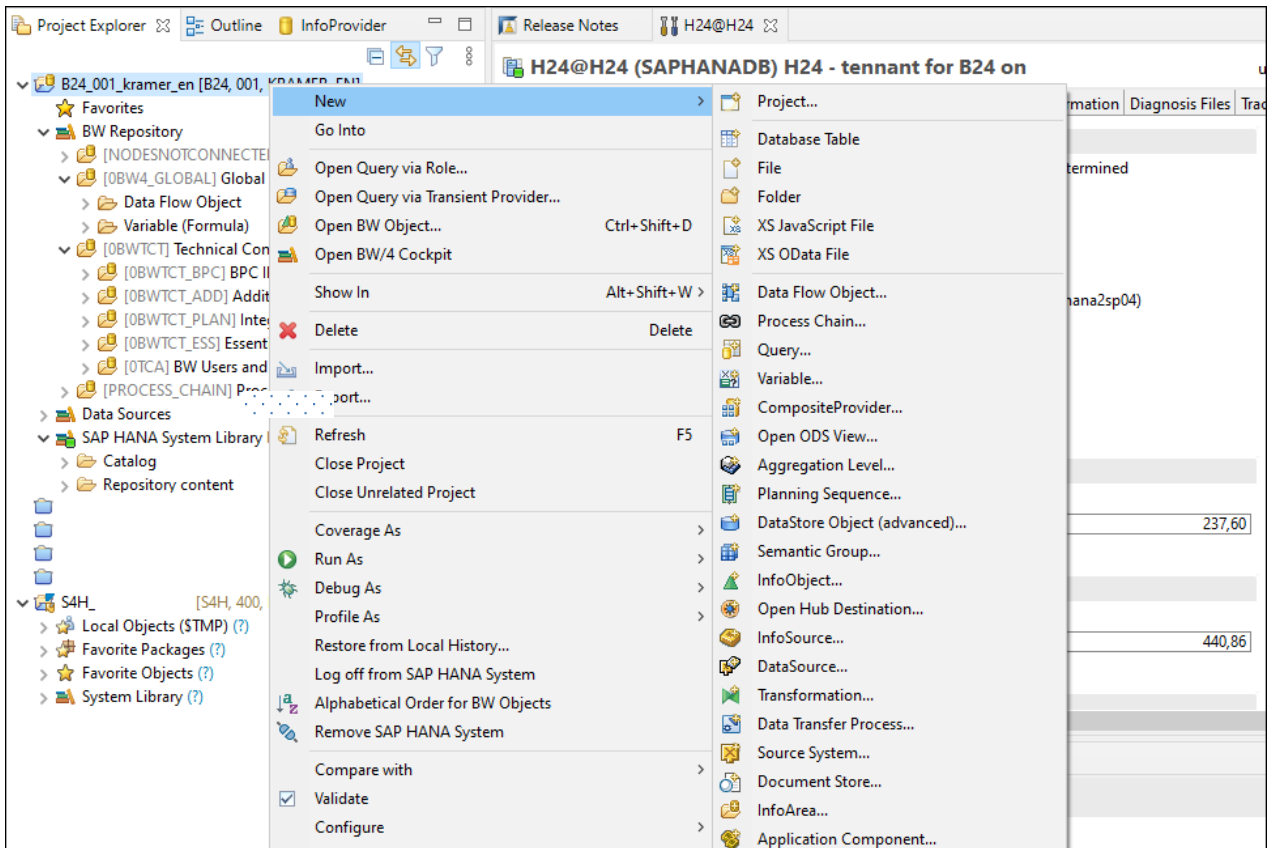
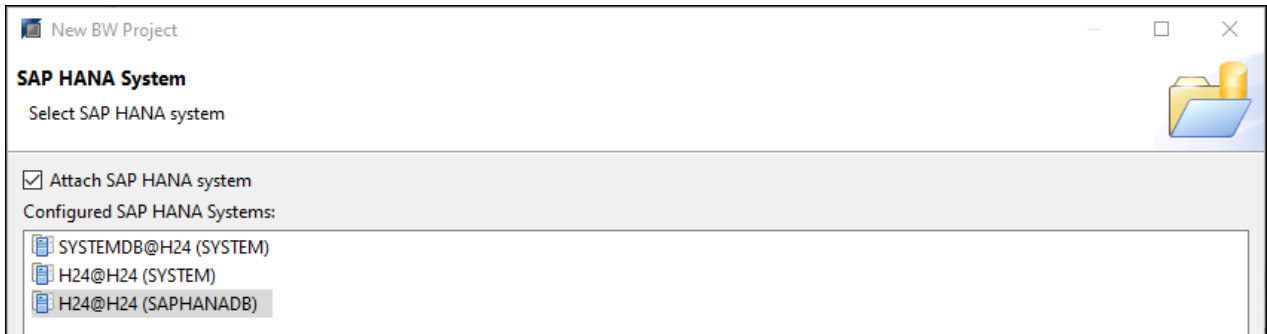
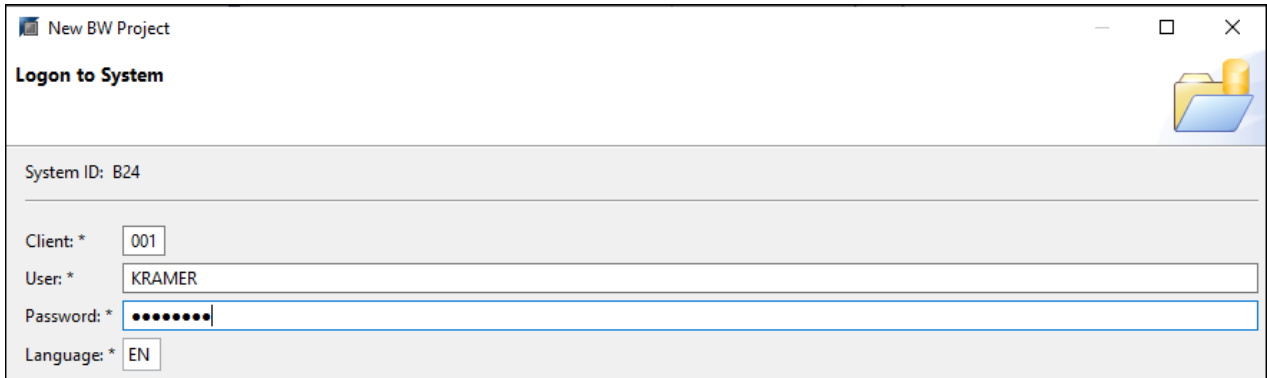
The screenshot shows the SAP Systems browser interface. On the left, a tree view shows the hierarchy: Azure > H24 > H4S > H4S@H4S (SYSTEM) sap. The main pane displays the 'General Information' for this system. The 'Operational Status' is 'All services started'. Other details include 'System Usage: Custom System', 'Start Time of First Started Service: 27.10.2020 13:59:05', 'Start Time of Most Recently Started Service: 27.10.2020 14:01:01', 'Distributed System: No', 'Version: 2.00.053.00.1603311174 (fa/hana2sp05)', 'Build Time: 21.10.2020 22:22:17', 'Platform: openSUSE Tumbleweed', 'Linux Kernel Version: 5.8.15-1-default', 'Hardware Manufacturer: Microsoft Corporation', and 'Installed Plug-ins: AFL,SAP_AFL_SDK_APL'. At the bottom, the 'SAP HANA Used Memory' section shows 'Used Memory/Peak Used Memory/Allocation Limit (GB)' as 'On Host 60,63/60,77' and '423,04'.

The screenshot shows the 'New BW Project' dialog box with the 'System Connection' tab selected. The instruction is 'Associate the new project with an SAP system connection'. Below, it says 'Define a new system connection from scratch, or select an existing SAP Logon entry from the list:'. A search box contains 'B24'. A table lists existing connections:

Name	Desc...	SID	Group/Server	Inst...	Message Server	SNC	SSO	Router
B24 - BW/4 2.0 in Azure		B24	sap azure.com	08		Disabled	no	
B24 - BW/4 2.0 SP01		B24		08		Disabled	no	

The screenshot shows the 'New BW Project' dialog box with the 'Connection Settings' tab selected. The instruction is 'System connection for the new BW project'. The 'Connection Parameters' section is expanded, showing the following fields:

- System ID: * B24
- Connection Type: Custom Application Server
- Message Server: *
- Group: *
- Message Server Port:
- Application Server: * sap: .azure.com
- Instance Number: * 08



5.2.2 Access via OS level

To access the BW/4HANA server, you can use [Putty \(0.74\)](#) with the MobaXterm for Linux/UNIX based Installations. For details, how to use it, visit the URL <http://mobaxterm.mobatek.net/features.html>

MobaXterm allows the graphical access to the Linux VM and works together with Putty. Once the connection is created in Putty, you can import the settings into MobaXterm

```

root@s
Using username "root".

Welcome to SUSE Linux Enterprise Server for SAP Applications 12 SP2 (x86_64) - Kernel \r (\l).

root@westeurope.cloudapp.azure.com's password:
Last failed login: Wed Jul  5 14:51:57 CEST 2017 from 10.0.0.1 on ssh:notty
There was 1 failed login attempt since the last successful login.
Last login: Wed Jul  5 14:51:35 2017 from :
SUSE Linux Enterprise Server 12 SP2 for SAP Applications x86_64 (64-bit)

Please register this image using your existing SUSE entitlement.

As "root" (sudo or sudo -i) use either one of the following commands:
- SUSEConnect --url=https://scc.suse.com -e company@example.com -r YOUR_CODE
- yast scc

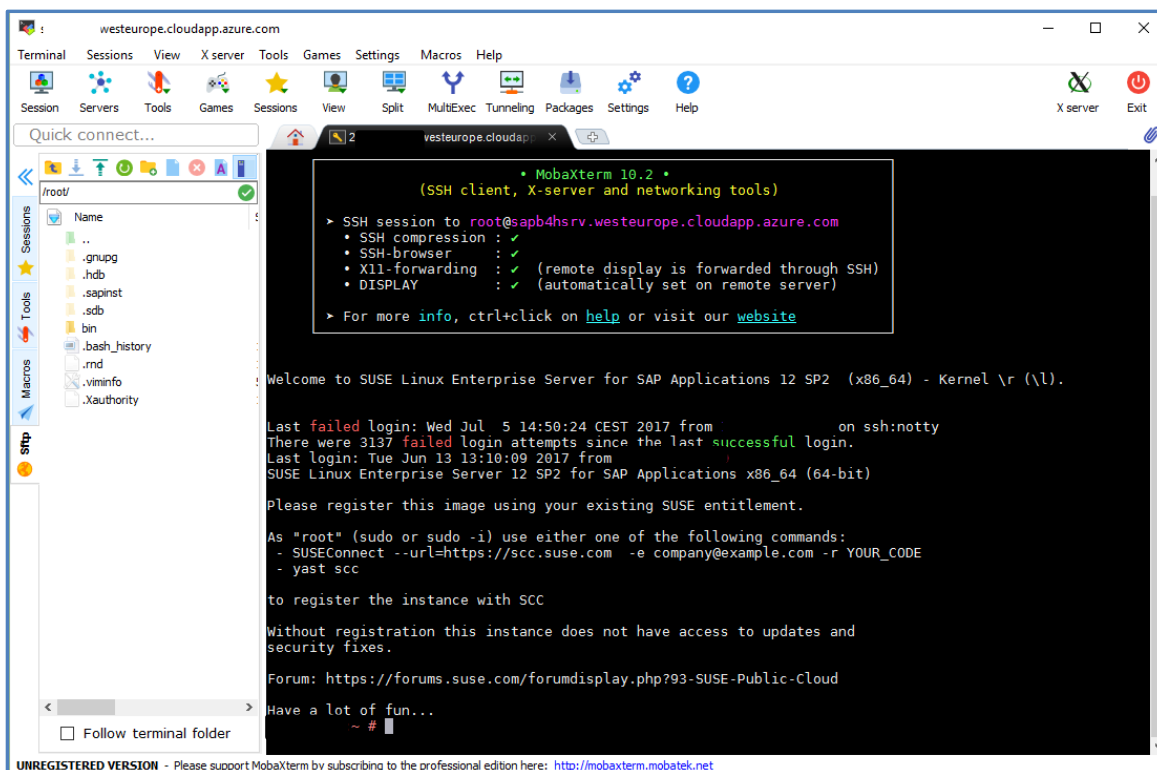
to register the instance with SCC

Without registration this instance does not have access to updates and
security fixes.

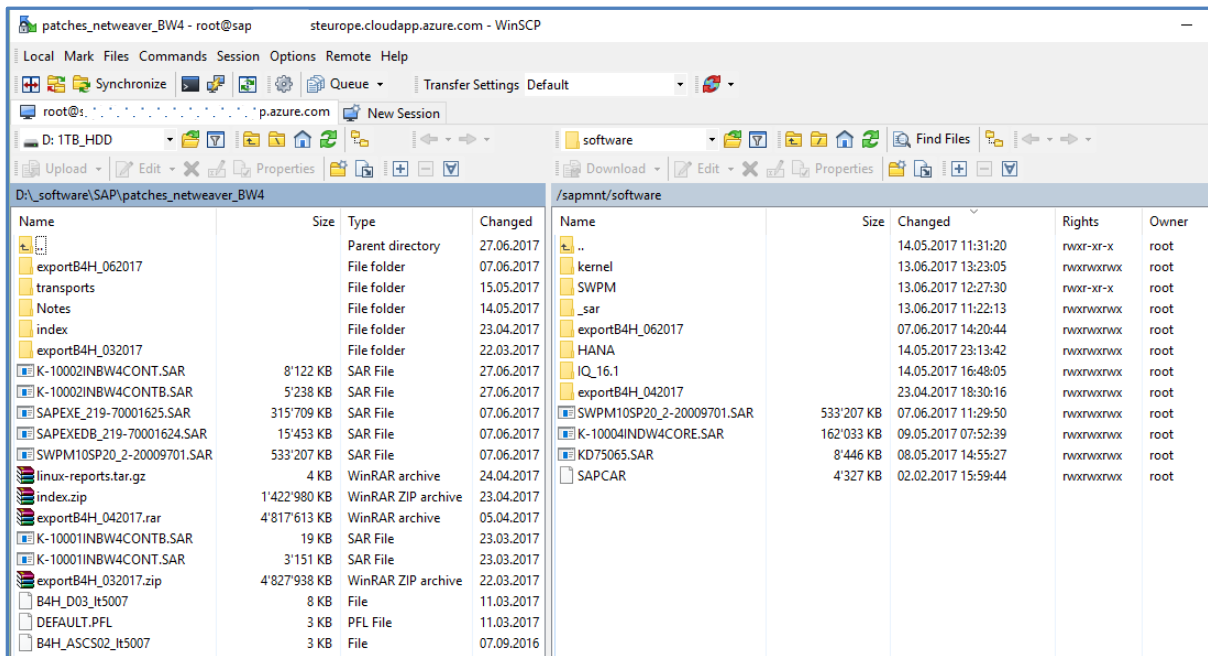
Forum: https://forums.suse.com/forumdisplay.php?93-SUSE-Public-Cloud

Have a lot of fun...

```



Even that MobaXterm also includes a FTP tool, [WinSCP](#) is more convenient for the usage. However, feel free to use the tools of your choice.



xhost +<server.domain.ext>

5.2.3 Access the XSa Infrastructure

Depending on the way, you implemented the XSa Infrastructure you haven to open some additional Ports to allow the access of several applications like WebIDE, DWF, XSa Monitoring/Cockpit, etc.

[Note 2245631 - Routing Mode and Default Domain configuration for SAP HANA extended application services, advanced model](#)

[Note 2711421 - Installing SAP HANA Extended Application Services, advanced model using the XS Advanced installation media](#)

1280	WebIDE_App_in	53075	Any
1290	XSa_..._in	30130-30132	Any
1300	XSa_DWF_in	51077	Any
1310	XSa_Dev_in	51022	Any
1320	XSa_Execution_in	49951	Any

xs-admin-login

xs version → shows additional application ports

h4badm@...rv:/usr/sap/H4B/HDB01/.../trace> tail -f xscontroller.out

6. Further Settings and Connectivity

Now that you rudimental find your way around the Microsoft Azure Infrastructure there are additional settings and connectivity options which enables for example the access of the existing IT infrastructure inside your network or other IT topics.

6.1 Activate the Azure PowerShell

Even that you can configure almost everything in the Azure Portal for your Cloud based Infrastructure, some enhancements are available with the Azure PowerShell only.

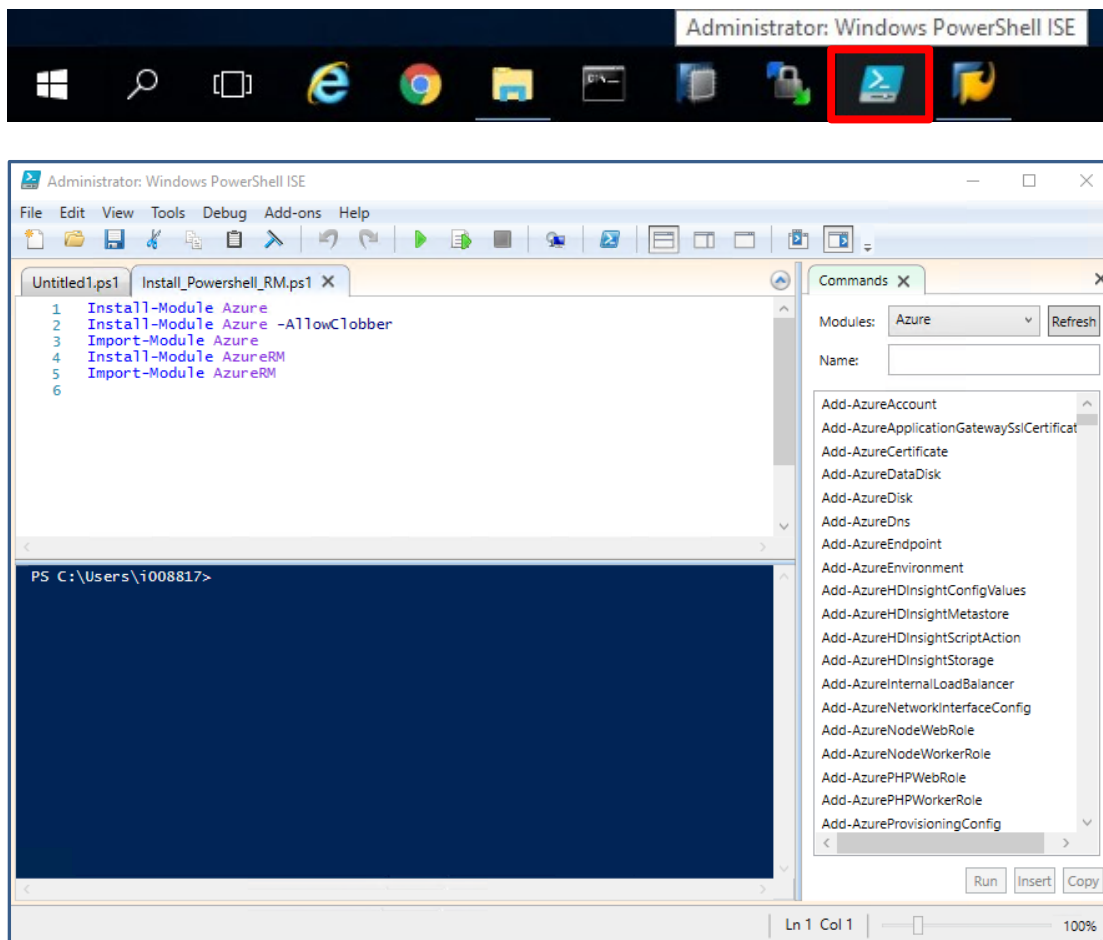
The Azure PowerShell is an extension to the Windows PowerShell and provides a set of cmdlets that use the [Azure Resource Manager](#) model for managing your Azure resources.

Review the [Install](#) article to get Azure PowerShell up and running on your system. Then read the [Get Started](#) article to begin using it. For information about the latest release, see the [release notes](#).

The following samples can help you learn how to perform common scenarios with Azure PowerShell:

- [Linux Virtual Machines](#)
- [Windows Virtual Machines](#)

[Log in with Azure PowerShell](#)



6.1.1 Useful Power Shell snippets

6.1.1.1 Logon via PowerShell

```
Login-AzureRmAccount
```

```
Select-AzureRmSubscription -SubscriptionId <your-SID> -SubscriptionName <your-SIN>
```

6.1.1.2 Change internal IP address

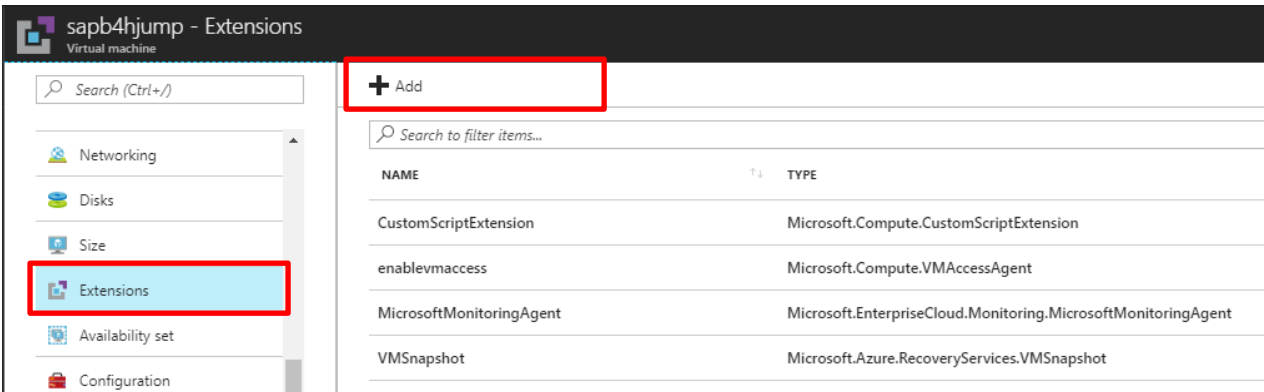
With this snippet, you can change the internal IP address without deallocate the IP first. This is useful in case you used a wrong IP Range on Azure which would interfere with the on-premise IP Range in case of a VPN Tunnel usage.

```
$vnet = Get-AzureRmVirtualNetwork -Name <your-vnet> -ResourceGroupName <your-group>
$subnet = Get-AzureRmVirtualNetworkSubnetConfig -Name FrontEnd -VirtualNetwork $vnet
$nic = Get-AzureRmNetworkInterface -Name <your-network-If> -ResourceGroupName <your-
vnet>
$nic | Set-AzureRmNetworkInterfaceIpConfig -Name ipconfig1 -PrivateIpAddress
10.xxx.xxx.xxx -Subnet $subnet -Primary
$nic | Set-AzureRmNetworkInterface
```

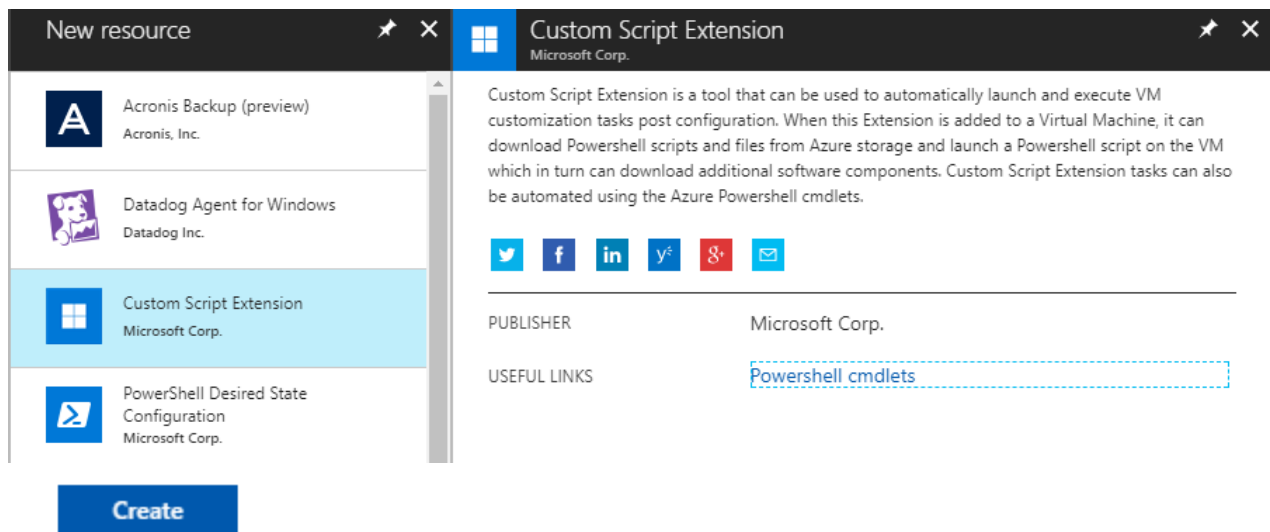
6.1.1.3 Add the CustomScriptExtension

With this Extension it is possible to run Administration Scripts against a Windows Domain controller, as there are limitation in the usage of certain commands, e.g. Changing or extending the Lifetime of the Domain Controller Password, etc.

Go to the Details of your Virtual machine and select Extensions on the left side and use the +Add Button to add the CustomScriptExtension



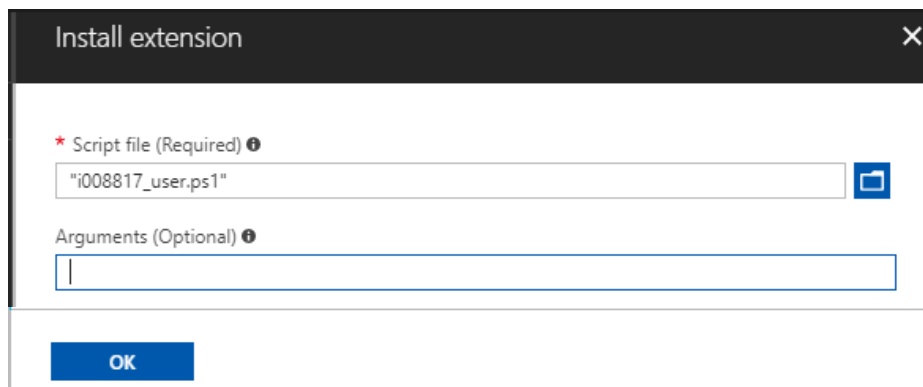
NAME	TYPE
CustomScriptExtension	Microsoft.Compute.CustomScriptExtension
enablevmaccess	Microsoft.Compute.VMAccessAgent
MicrosoftMonitoringAgent	Microsoft.EnterpriseCloud.Monitoring.MicrosoftMonitoringAgent
VMSnapshot	Microsoft.Azure.RecoveryServices.VMSnapshot



Create a script with the ending *.ps1 and paste the necessary command into it.

- [Get-AzureADUser](#) / [Set-AzureADUser](#)

Select the script from your local frontend and press the OK Button. The script will now run against the VM.



Azure Help - [How to reset the Remote Desktop service or its login password in a Windows VM](#)

Azure Help - <https://docs.microsoft.com/en-us/azure/virtual-machines/windows/extensions-customscript#powershell-deployment>

6.2 Additional connectivity for the Cloud

6.2.1 Activate a customer DNS service

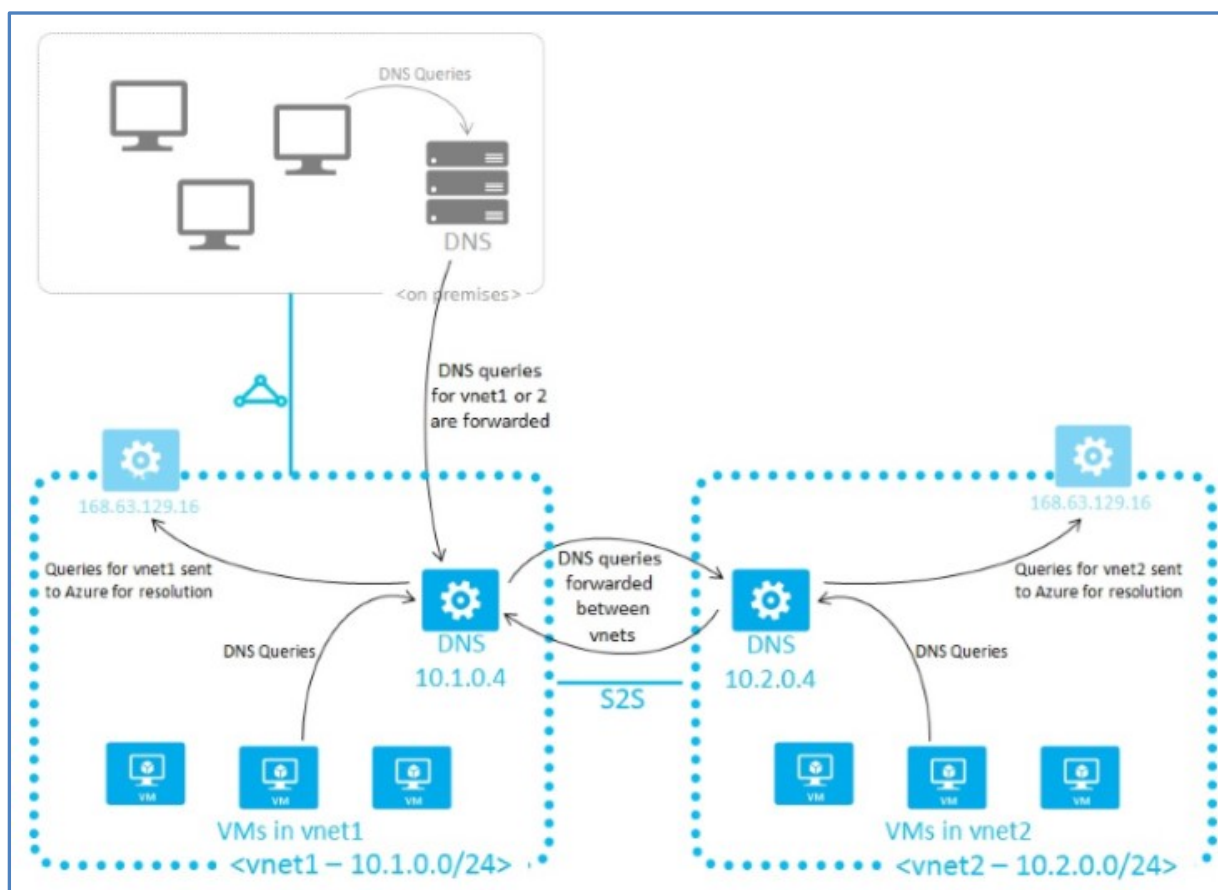
The first step to make your on-premise server and applications are visible for the Azure Cloud environment beside the [Network security groups](#), is to activate an own DNS service.

For this service the existing Jumpserver based on Win64 can be used. Of course, you can also choose another VM for that service.

[Microsoft Azure Help](#)

[Name Resolution for VMs and Role Instances](#)

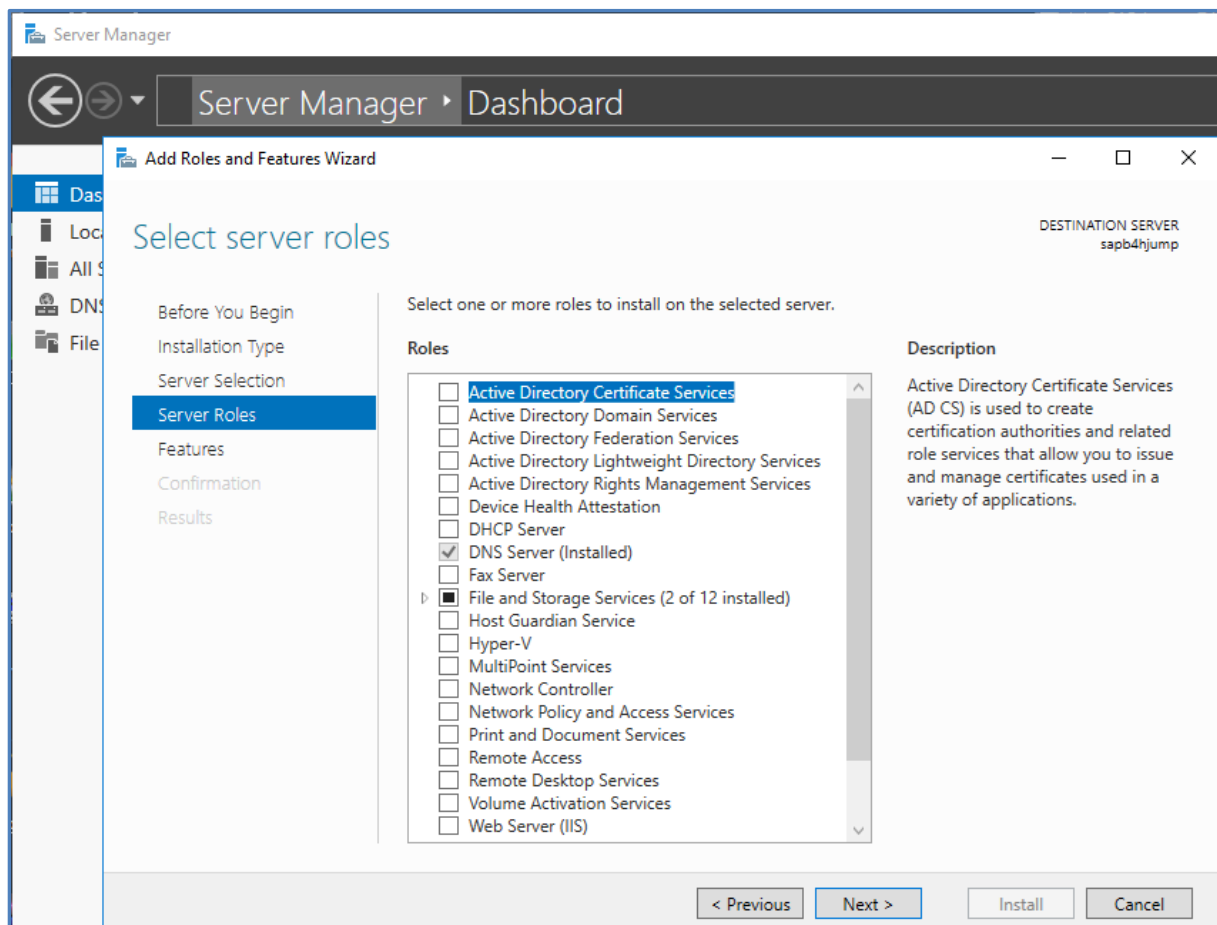
[Name resolution using your own DNS server](#)



[Microsoft Azure Help](#)

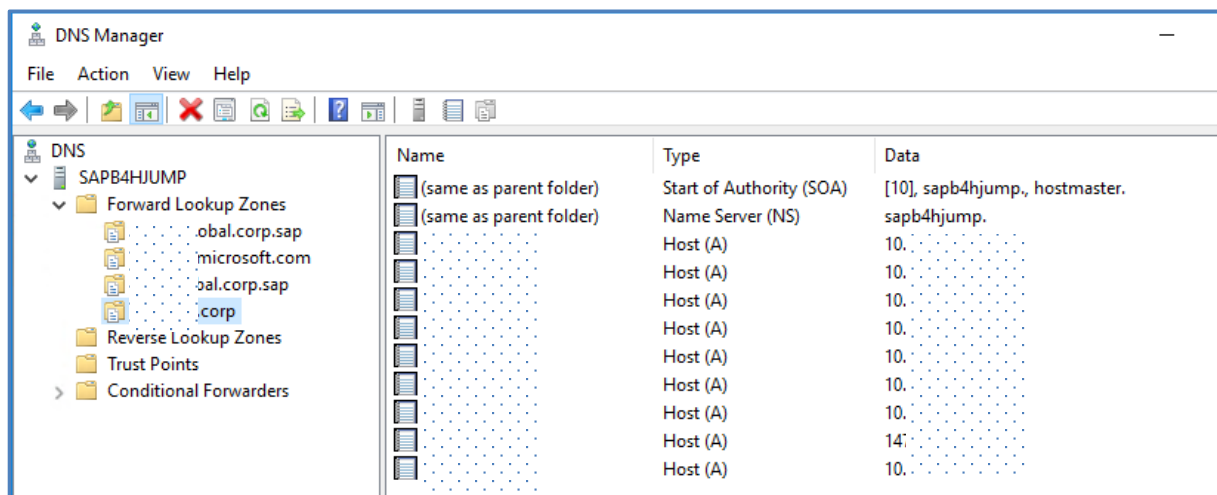
[Specify a DNS server in Azure](#)

Logon to the Jumpserver and use the Server Manager Application to add the DNS server role.



After the DNS service is activated, you can configure the DNS application accordingly.

- Create Forward Lookup Zones
- Within the Zones create Hosts (A or AAAA)

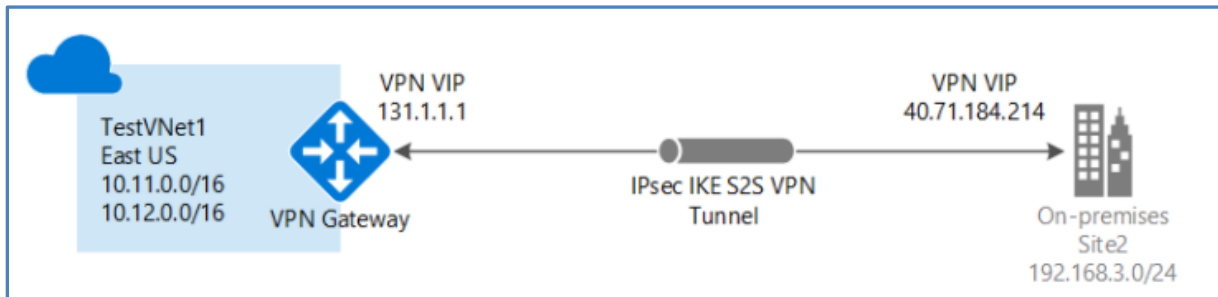


6.2.2 Configure a Site-to-Site connection

The Site-to-Site connection is necessary to allow the communication between the on-premise systems and the Cloud hosted servers.

[Microsoft Azure Help](#)

[Create a Site-to-Site connection in the Azure portal](#)



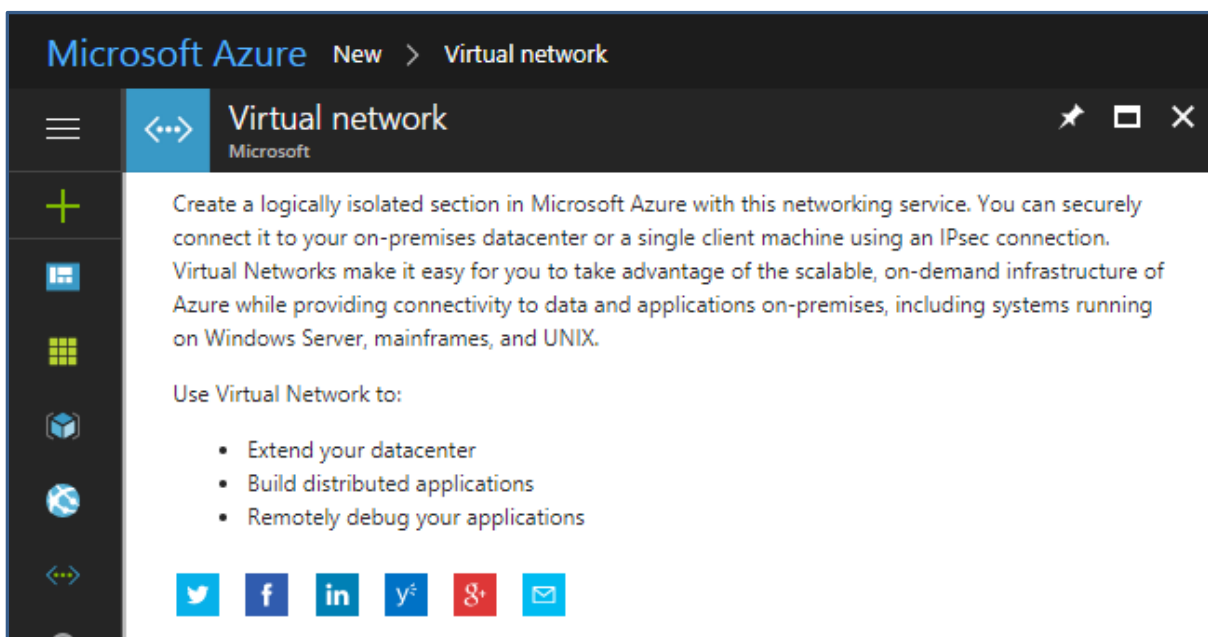
As this is a complex process there are several components to touch and some of them are already configured during the process of the creation of the VM's.

Check with your Network Security Team first to plan the VPN Gateway properly.

[Microsoft Azure Help](#)

- [Before you begin](#)
- [Planning and design for VPN Gateway](#)
- [About VPN devices and IPsec/IKE parameters for Site-to-Site VPN Gateway connections](#)

6.2.2.1 Create a virtual network



Select a deployment model ⓘ

Resource Manager

Create

Create virtual network

* Name: VNet_BW4onAzure ✓

* Address space ⓘ: 10.1.0.0/24 ✓
10.1.0.0 - 10.1.0.255 (256 addresses)

* Subnet name: GatewaySubnet ✓

* Subnet address range ⓘ: 10.1.0.0/24 ✓
10.1.0.0 - 10.1.0.255 (256 addresses)

* Subscription: (CH) ✓

* Resource group ⓘ: Create new Use existing
BW4onAzure ✓

* Location: West Europe ✓

6.2.2.2 Specify a DNS server

azure_vpn_net_extension - DNS servers
Virtual network

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags

Save Discard

DNS servers ⓘ

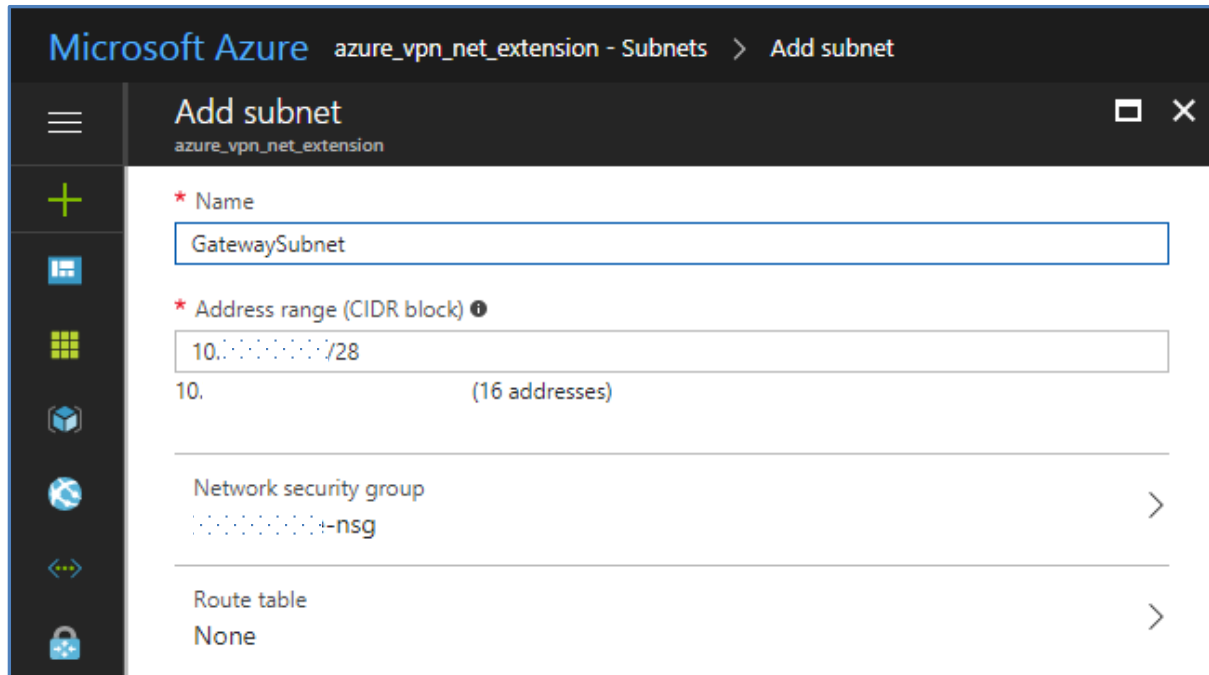
Default (Azure-provided)

Custom

10.1.0.0 ...

Add DNS server ...

6.2.2.3 Create the gateway subnet



Microsoft Azure azure_vpn_net_extension - Subnets > Add subnet

Add subnet
azure_vpn_net_extension

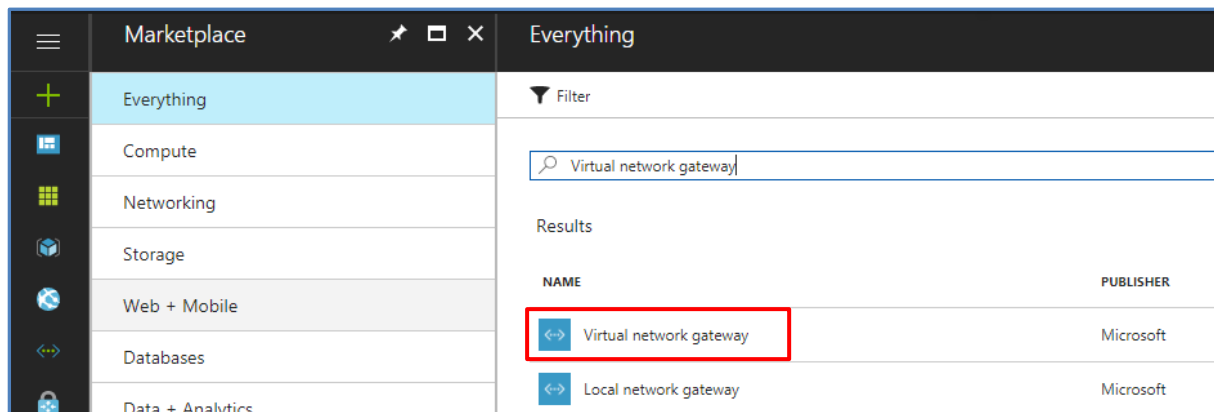
* Name
GatewaySubnet

* Address range (CIDR block) ⓘ
10.10.10.0/28
10. (16 addresses)

Network security group
10.10.10.0-nsg >

Route table
None >

6.2.2.4 Create the VPN gateway



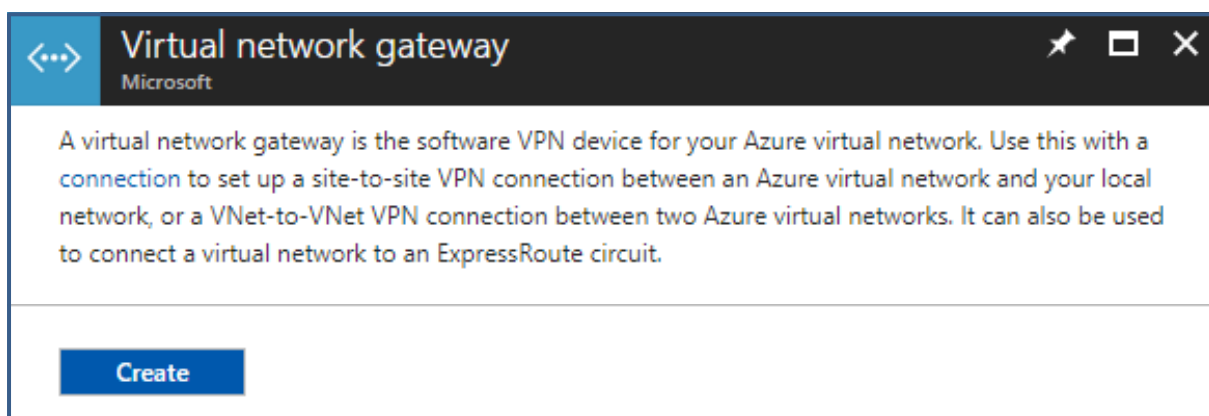
Marketplace Everything

Filter

Virtual network gateway

Results

NAME	PUBLISHER
Virtual network gateway	Microsoft
Local network gateway	Microsoft



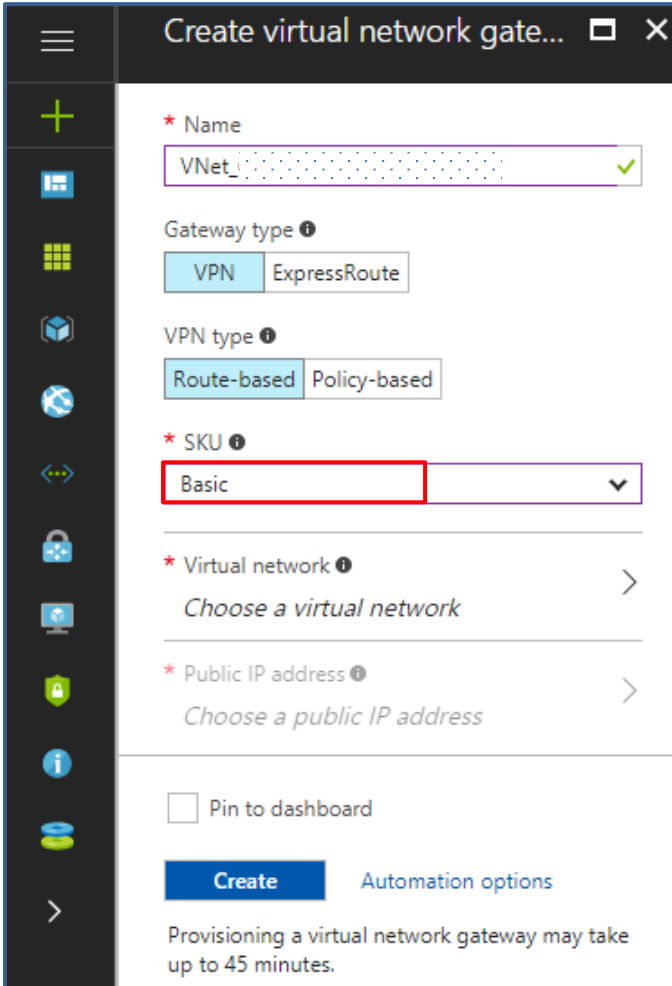
Virtual network gateway
Microsoft

A virtual network gateway is the software VPN device for your Azure virtual network. Use this with a connection to set up a site-to-site VPN connection between an Azure virtual network and your local network, or a VNet-to-VNet VPN connection between two Azure virtual networks. It can also be used to connect a virtual network to an ExpressRoute circuit.

Create

Microsoft Azure Help

[Create your first virtual network](#)



Create virtual network gate...

* Name
VNet_...

Gateway type
VPN ExpressRoute

VPN type
Route-based Policy-based

* SKU
Basic

* Virtual network
Choose a virtual network

* Public IP address
Choose a public IP address

Pin to dashboard

Create Automation options

Provisioning a virtual network gateway may take up to 45 minutes.

6.2.2.5 Create the local network gateway



NAME	PUBLISHER
Local network gateway	Microsoft
Virtual network gateway	Microsoft

Local network gateway

Microsoft

A local network gateway represents the hardware or software VPN device in your local network. Use this with a [connection](#) to set up a site-to-site VPN connection between an Azure virtual network and your local network.

There are no additional charges for creating local network gateways in Microsoft Azure.

[Create](#)

Create local network gateway

* Name
Customer_Gateway ✓

* IP address ⓘ
155.155.155.155 ✓

Address space ⓘ
10.10.0.0/10 ...
[Add additional address range](#) ...

* Subscription
[Subscription ID] ▼

* Resource group ⓘ
 Create new Use existing
EDW ▼

* Location
West Europe ▼

[Create](#) [Automation options](#)

6.2.2.6 Configure your VPN device

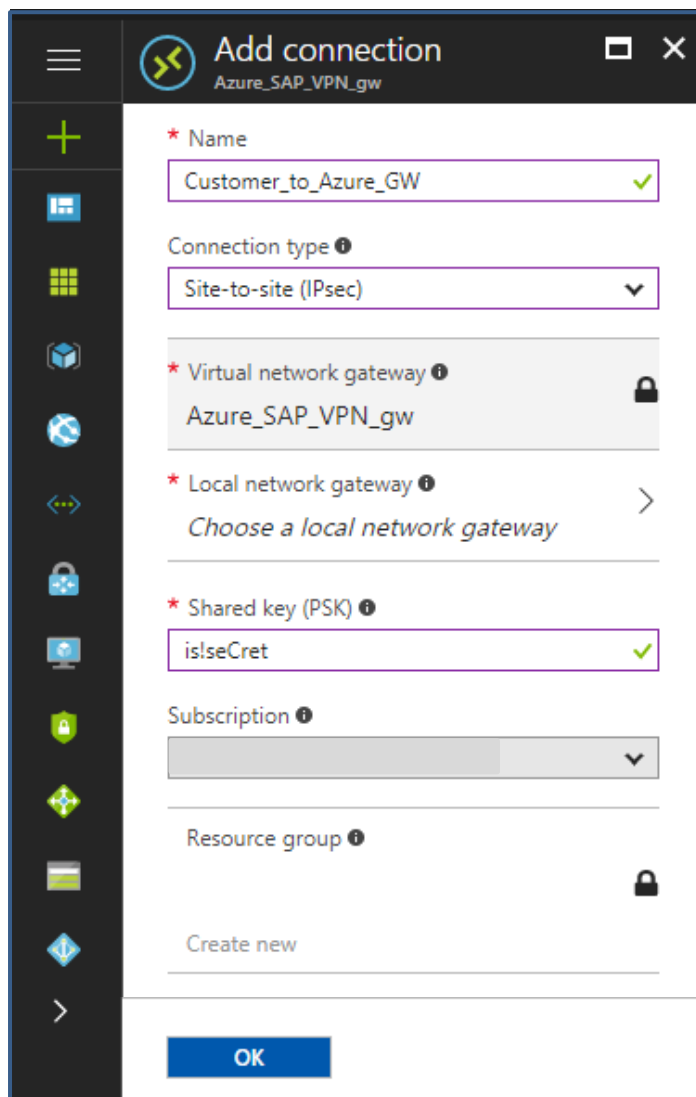
Microsoft Azure Help

[Validated VPN devices and device configuration guides](#)

6.2.2.7 Create the VPN connection

Microsoft Azure Help

[Create a VNet with a Site-to-Site VPN connection using PowerShell](#)



The screenshot shows the 'Add connection' dialog box in the Azure portal. The dialog is titled 'Add connection' and has a subtitle 'Azure_SAP_VPN_gw'. It contains several fields and options:

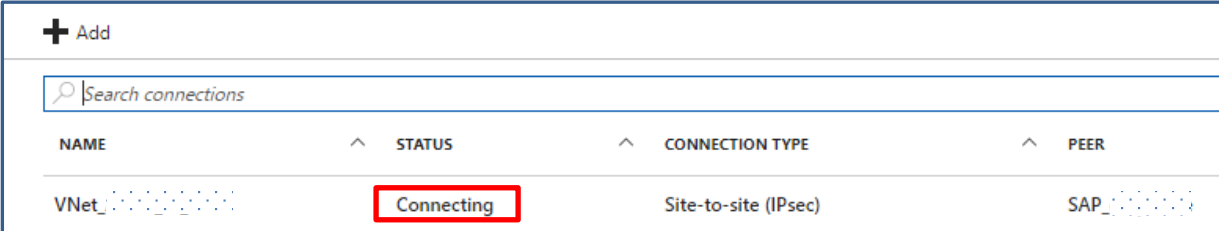
- Name:** A text input field containing 'Customer_to_Azure_GW' with a green checkmark to its right.
- Connection type:** A dropdown menu showing 'Site-to-site (IPsec)' with a downward arrow.
- Virtual network gateway:** A dropdown menu showing 'Azure_SAP_VPN_gw' with a lock icon to its right.
- Local network gateway:** A dropdown menu showing 'Choose a local network gateway' with a rightward arrow.
- Shared key (PSK):** A text input field containing 'is!seCret' with a green checkmark to its right.
- Subscription:** A dropdown menu that is currently blank.
- Resource group:** A dropdown menu that is currently blank with a lock icon to its right.
- Create new:** A text input field for creating a new resource group.

At the bottom of the dialog is a blue 'OK' button.

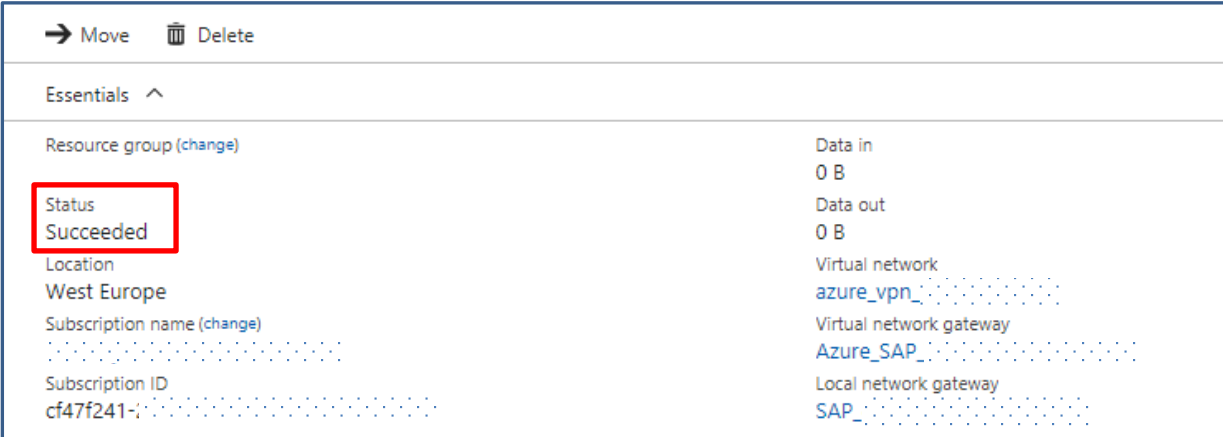
6.2.2.8 Verify the VPN connection

In the Azure portal, you can view the connection status of a Resource Manager VPN Gateway by navigating to the connection. The following steps show one way to navigate to your connection and verify.

1. In the [Azure portal](#), click All resources and navigate to your virtual network gateway.
2. On the blade for your virtual network gateway, click Connections. You can see the status of each connection.
3. Click the name of the connection that you want to verify to open Essentials. In Essentials, you can view more information about your connection. The Status is 'Succeeded' and 'Connected' when you have made a successful connection.



NAME	STATUS	CONNECTION TYPE	PEER
VNet_...	Connecting	Site-to-site (IPsec)	SAP_...



Essentials	
Resource group (change)	Data in
Status	0 B
Succeeded	Data out
Location	0 B
West Europe	Virtual network
Subscription name (change)	azure_vpn_...
Subscription ID	Virtual network gateway
cf47f241-...	Azure_SAP_...
	Local network gateway
	SAP_...

[To connect to a virtual machine](#)

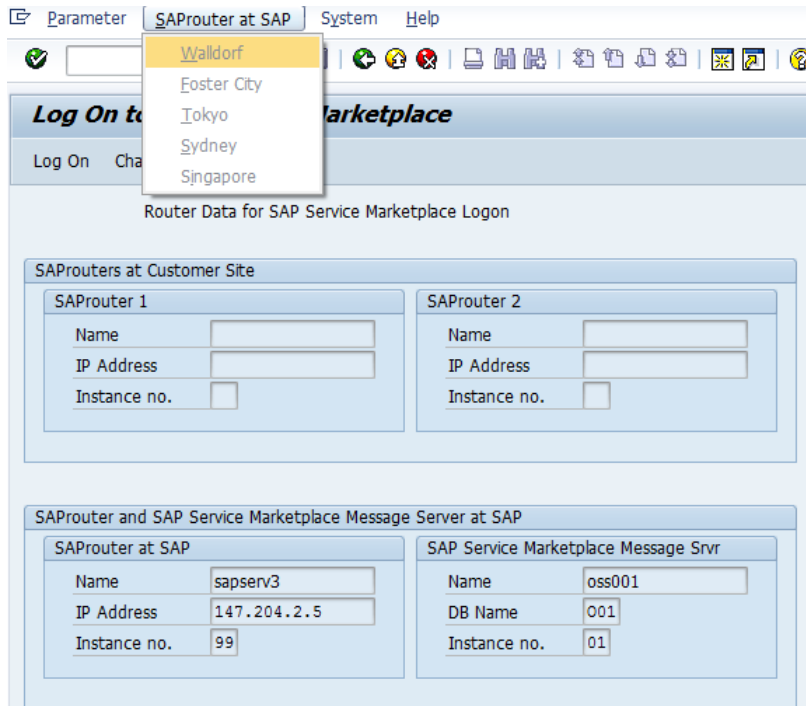
You can connect to a VM that is deployed to your VNet by creating a Remote Desktop Connection to your VM. The best way to initially verify that you can connect to your VM is to connect by using its private IP address, rather than computer name. That way, you are testing to see if you can connect, not whether name resolution is configured properly.

[Microsoft Azure Help](#)

[How to configure BGP on Azure VPN Gateways using PowerShell](#)

6.2.3 Connect the SAP system to sapservX

To enable the automatic download of SAP Notes via tx. SNOTE, the SAP system located in the Azure Cloud needs access to the sapservX service.



There is no need to maintain a SAP Router service on the Azure Cloud, a designated Firewall rule with your local Network is necessary.



SAP Help - [Support Backbone Update](#)

[Note 1668882 - Note Assistant: Important notes for SAP_BASIS 730,731,740,750](#)

[Note 2738426 - Automated Configuration of new Support Backbone Communication](#)

task list SAP_BASIS_CONFIG_OSS_COMM

[Note 2631190 - Download location of SSL certificates req for Support Hub Connectivity configuration](#)

[Note 2827658 - Automated Configuration of new Support Backbone Communication - Update 02](#)

contains TCI K75000KCPSAPBASIS.SAR

[Note 2836302 - Automated guided steps for enabling Note Ass. for TCI and Digitally Signed SAP Notes](#)

report RCWB_TCI_DIGITSIGN_AUTOMATION

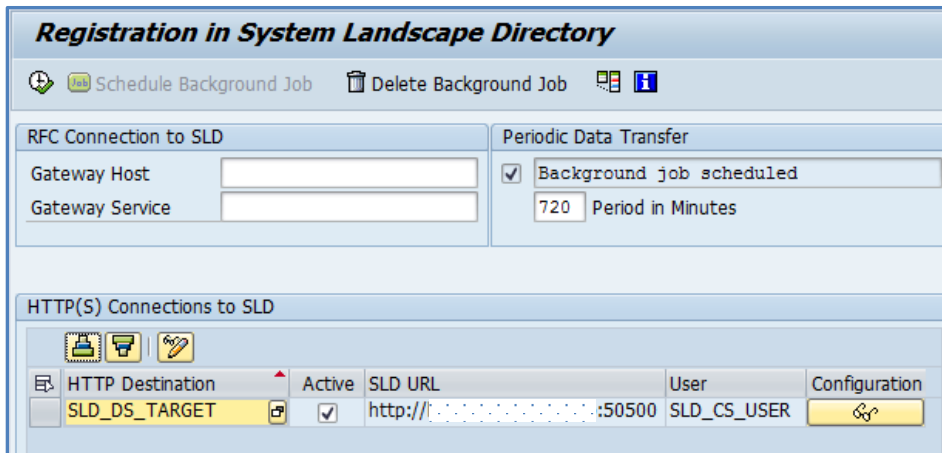
[Note 2869143 - Composite note for handling of Digitally Signed SAP Notes in Note Assistant \(SNOTE\)](#)

6.2.4 Connect Azure based System to local SLD/LMDB

Another important connection to realize, is the update of the existing system landscape directory with your SAP Systems available in the Azure Cloud. Assuming the SLD service and the corresponding LMDB hosted on the Solution Manager is available in the on-premise Network only.

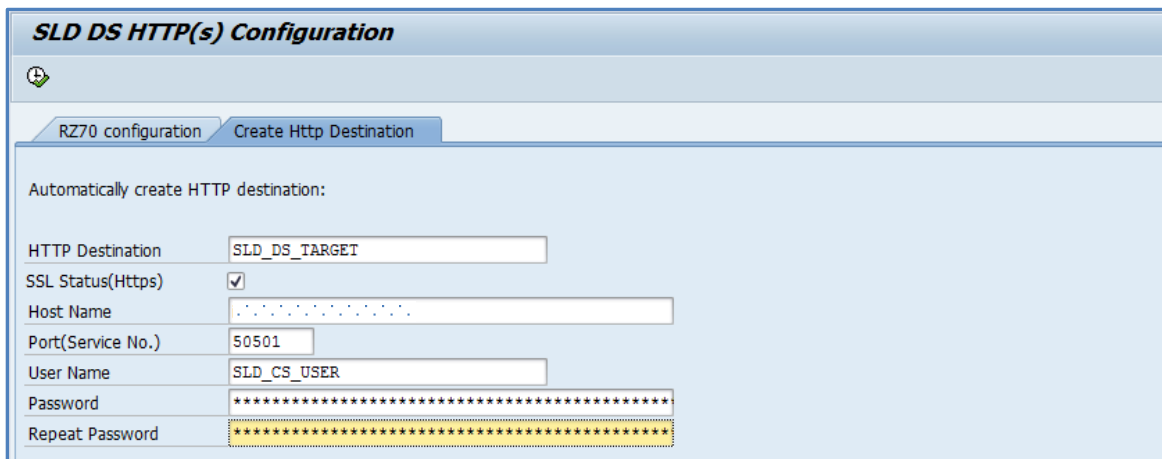
To maintain software lifecycle task, the system data needs to be updated to the SLD service via tx. RZ70. Details of the activation can be found here -

[SAP First Guidance – SEM/BW Modelling in SolMan 7.1 with MOPZ/MP](#)



[Note 2188401 - Enabling HTTP\(S\) in RZ70](#)

Use the Program RSLDHTTPCONF to configure the HTTP(S) support in Transaction RZ70



[SAP First Guidance – complete functional scope \(CFS\) for SAP BW 7.50](#)

[Note 2046334 - Distribution of TMS configuration ends with an error](#)

[Note 2691074 - SPAM / SAINT hangs at IMPORT_PROPER problem connecting to Message Server](#)

niping -v

6.3 smart data integration (SDI) with SAP HANA

Blog - [Smart Data Integration available for the SAP Cloud Platform](#)

Blog - [next Mystery solved – proper SAC Connection](#)

The SAP HANA smart data integration and SAP HANA smart data quality options provide tools to access source data, and provision, replicate, and transform that data in SAP HANA on-premise or in the cloud. The smart data integration and smart data quality options let you enhance, cleanse, and transform data to make it more accurate and useful. These options let you efficiently connect to any source to provision and cleanse data for loading into SAP HANA on-premise or in the cloud, and for supported systems, write back to the original source.

SAP Help - [SAP HANA Smart Data Integration and SAP HANA Smart Data Quality](#)

SAP Help - [Enable the Server in a Multi-database Container Scenario](#)

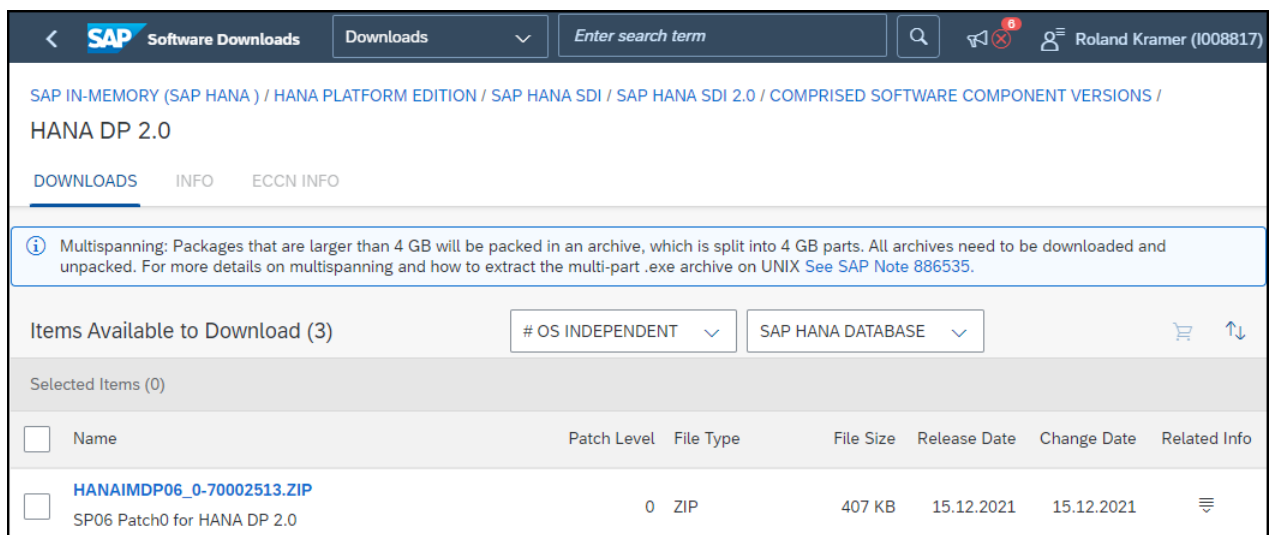
Start a “dpserver” on the SAP HANA Server as follows:

```
ALTER DATABASE H4X ADD 'dpserver'
```


SAP Help - [Download and Deploy the Data Provisioning Delivery Unit](#)

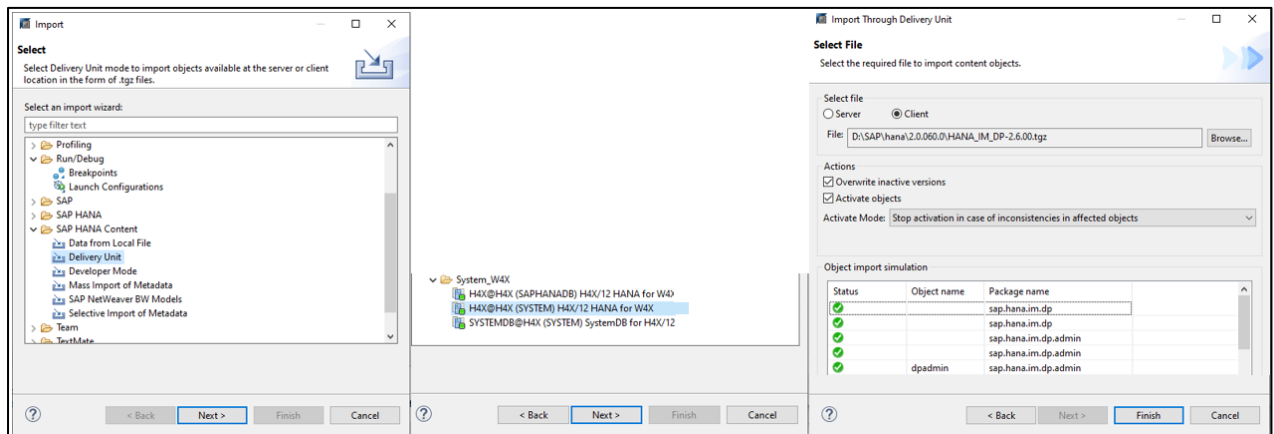
Import the Delivery Unit for SDI as well

[Note 3127084 - SAP HANA Smart Data Integration and SAP HANA SDQ 2.0 SP 06 Patch 0x \(2.6.0\)](#)



The screenshot shows the SAP Software Downloads interface. The breadcrumb trail is: SAP IN-MEMORY (SAP HANA) / HANA PLATFORM EDITION / SAP HANA SDI / SAP HANA SDI 2.0 / COMPRISED SOFTWARE COMPONENT VERSIONS / HANA DP 2.0. The page has tabs for DOWNLOADS, INFO, and ECCN INFO. A notification banner states: "Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See SAP Note 886535." Below this, there are filters for "Items Available to Download (3)", "# OS INDEPENDENT", and "SAP HANA DATABASE". A table lists the available items:

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	HANAIMDP06_0-70002513.ZIP SP06 Patch0 for HANA DP 2.0	0	ZIP	407 KB	15.12.2021	15.12.2021	



Install the latest Version of the DP Agent along with the DI Delivery Unit (higher Version are possible as the SAP HANA Version (e.g. DI Agent SP06 PL10 with HANA 2.0 SP05 PL59.01)

[Note 3141796 - SAP HANA Smart Data Integration and SAP HANA SDQ 2.0 SP 06 Patch 1x \(2.6.1\)](#)

[Note 3167432 - SDA & SDI - Creating Remote Sources via HANA Studio Fails](#)

SAP IN-MEMORY (SAP HANA) / HANA PLATFORM EDITION / SAP HANA SDI / SAP HANA SDI 2.0 / COMPRISED SOFTWARE COMPONENT VERSIONS /

HANA DP AGENT 2.0

DOWNLOADS INFO ECCN INFO

ⓘ Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See SAP Note 886535.

Items Available to Download (5) LINUX ON X86_64 64BIT

Selected Items (0)

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	IMDB_DPAGENT200_06P_20-70002516.ZIP SP06 Patch 20 (2.6.2.0) for HANA DP AGENT 2.0 (*)	20	ZIP	794501 KB		14.05.2022	☰
<input type="checkbox"/>	IMDB_DPAGENT200_06P_12-70002516.ZIP SP06 Patch 12 (2.6.1.2) for HANA DP AGENT 2.0	12	ZIP	789718 KB	17.03.2022	17.03.2022	☰
<input type="checkbox"/>	IMDB_DPAGENT200_06_0-70002516.ZIP SP06 for HANA DP AGENT 2.0	0	ZIP	783897 KB	15.12.2021	15.12.2021	☰

SAP Help - [Installation and Configuration Guide](#)

After the Installation (done with <sid>adm), you can check the availability of the Agents in HANA

```
select * from M_HOST_AGENT_INFORMATION
```

Release Notes *SQL Console 1 *H43@H43 - SQL Console 2 X

H43@H43 (SYSTEM) It :orp 01

SQL Result

select * from M_HOST_AGENT_INFORMATION

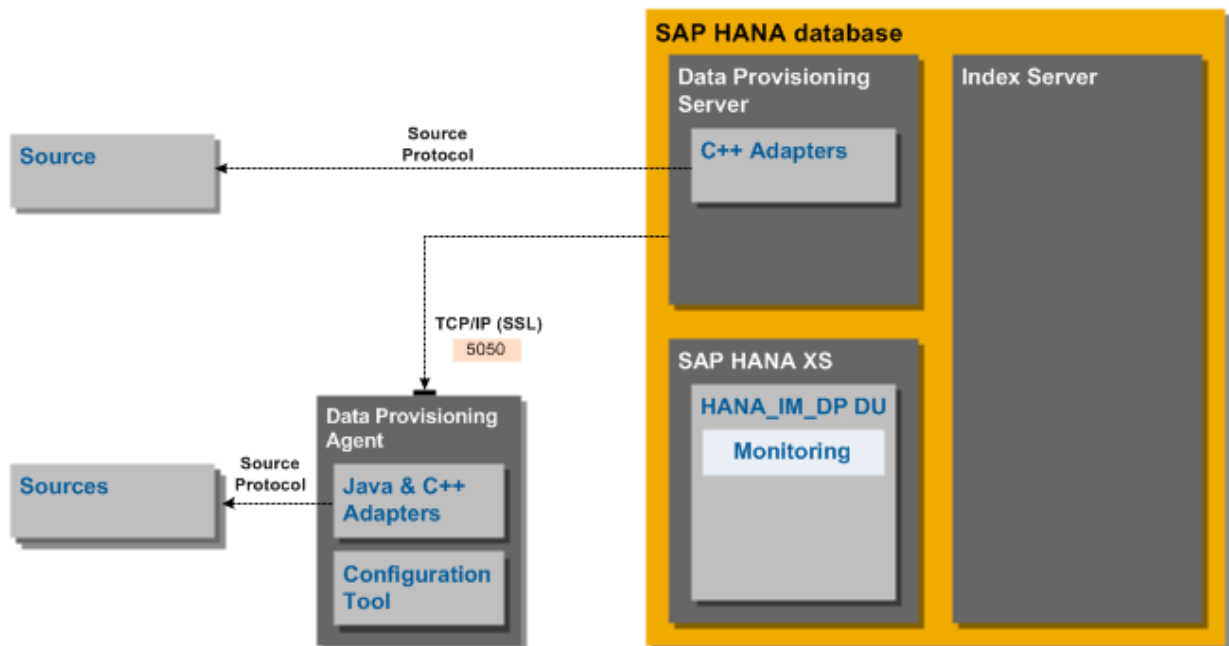
	HOST	CLASS_NAME	INSTANCE_NUMBER	PROPERTY_NAME	PROPERTY_VALUE
1	It	SAP_ITSAMComputerSystem	0	CPUCount	160
2	It	SAP_ITSAMComputerSystem	0	Caption	IBM System x3850 X5 -[7143Y62]-
3	It	SAP_ITSAMComputerSystem	0	CreationClassN...	SAP_ITSAMComputerSystem
4	It	SAP_ITSAMComputerSystem	0	FQDNName	It5087.wdf.sap.corp
5	It	SAP_ITSAMComputerSystem	0	Hostnames	localhost;It :orp;1...
6	It	SAP_ITSAMComputerSystem	0	IPAddresses	127.0.0.1;10. .9...
7	It	SAP_ITSAMComputerSystem	0	Manufacturer	IBM
8	It	SAP_ITSAMComputerSystem	0	Model	System x3850 X5 -[7143Y62]-
9	It	SAP_ITSAMComputerSystem	0	Name	It
10	It	SAP_ITSAMComputerSystem	0	NameFormat	IP
11	It	SAP_ITSAMComputerSystem	0	OperationalStatus	2;
12	It	SAP_ITSAMComputerSystem	0	SerialNumber	06T4949
13	It	SAP_ITSAMOperatingSystem	0	AvailablePhysic...	637066268
14	It	SAP_ITSAMOperatingSystem	0	CSCreationClass...	SAP_ITSAMComputerSystem
15	It	SAP_ITSAMOperatingSystem	0	CSName	It5087
16	It	SAP_ITSAMOperatingSystem	0	Caption	SUSE Linux Enterprise Server 12 ...
17	It	SAP_ITSAMOperatingSystem	0	CreationClassN...	SAP_ITSAMOperatingSystem
18	It	SAP_ITSAMOperatingSystem	0	CurrentTimeZone	60
19	It	SAP_ITSAMOperatingSystem	0	CurrentTimeZo...	CET
20	It	SAP_ITSAMOperatingSystem	0	FreePhysicalMe...	230719316
21	It	SAP_ITSAMOperatingSystem	0	FreeSpaceInPagi...	33521092
22	It	SAP_ITSAMOperatingSystem	0	FreeVirtualMem...	264240408
23	It	SAP_ITSAMOperatingSystem	0	KernelVersion	4.4.180-94.147-default #1 SMP ...
24	It	SAP_ITSAMOperatingSystem	0	Name	LINUX
25	It	SAP_ITSAMOperatingSystem	0	OSBits	64
26	It	SAP_ITSAMOperatingSystem	0	OSType	36
27	It	SAP_ITSAMOperatingSystem	0	PPMSName	LINUX X86 64

Start the Agent Configuration as follows:

```
h43adm@server:/usr/sap/dataprovagent/bin> ./agentcli.sh --configAgent
```

```
*****
DPAgent Configuration Tool
*****
1. Agent Status
2. Start or Stop Agent
3. Agent Preferences
4. Remote Source Credentials
5. SSL Keystores & Settings
6. Configure DPAgent HTTP(S) Proxy Authentication
7. SAP HANA Connection
8. Agent Registration
9. Adapter Registration
10. Custom Adapters
11. Agent & Adapter Versions
q. Quit
b. Back
*****
Enter Option: █
```

6.3.1 SAP HANA deployed on premise

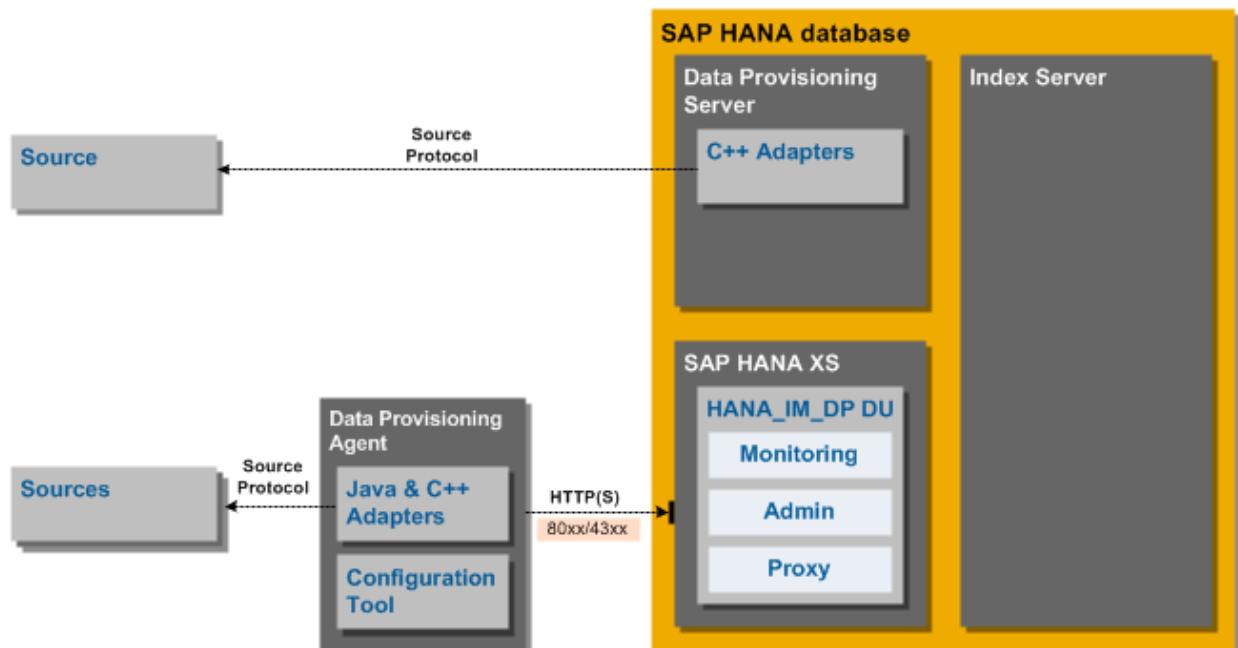


Outbound Connections

When SAP HANA is deployed on premise, the Data Provisioning Server within SAP HANA connects to the agent using the TCP/IP protocol (HTTP Port 5050 by default). To manage the listening port used by the agent, edit the adapter framework preferences with the Data Provisioning Agent Configuration tool.

The connections to external data sources depend on the type of adapter used to access the source. C++ adapters running in the Data Provisioning Server connect to the source using a source-defined protocol. Java adapters deployed on the Data Provisioning Agent connect to the source using a source-defined protocol.

6.3.2 SAP HANA deployed in the cloud or behind a firewall



Inbound Connections

When SAP HANA is deployed in the cloud or behind a firewall, the Data Provisioning Agent connects to the SAP HANA XS engine using the HTTP/S protocol. (HTTP Ports 80xx and 43xx by default)

When the agent connects to SAP HANA in the cloud over HTTP/S, data is automatically gzip compressed to minimize the required network bandwidth.

For information about configuring the port used by the SAP HANA XS engine, see the *SAP HANA Administration Guide*.

6.3.3 Components

SAP HANA smart data integration and SAP HANA smart data quality include several components that you need to install, deploy, and configure.

SAP Help - [Components to Install, Deploy, and Configure](#)

6.4 nearline storage (NLS) with SAP HANA

Overview

<https://blogs.sap.com/2016/10/12/sap-nls-solution-sap-bw/>

<https://blogs.sap.com/2015/11/17/increasing-the-sap-nls-performance/>

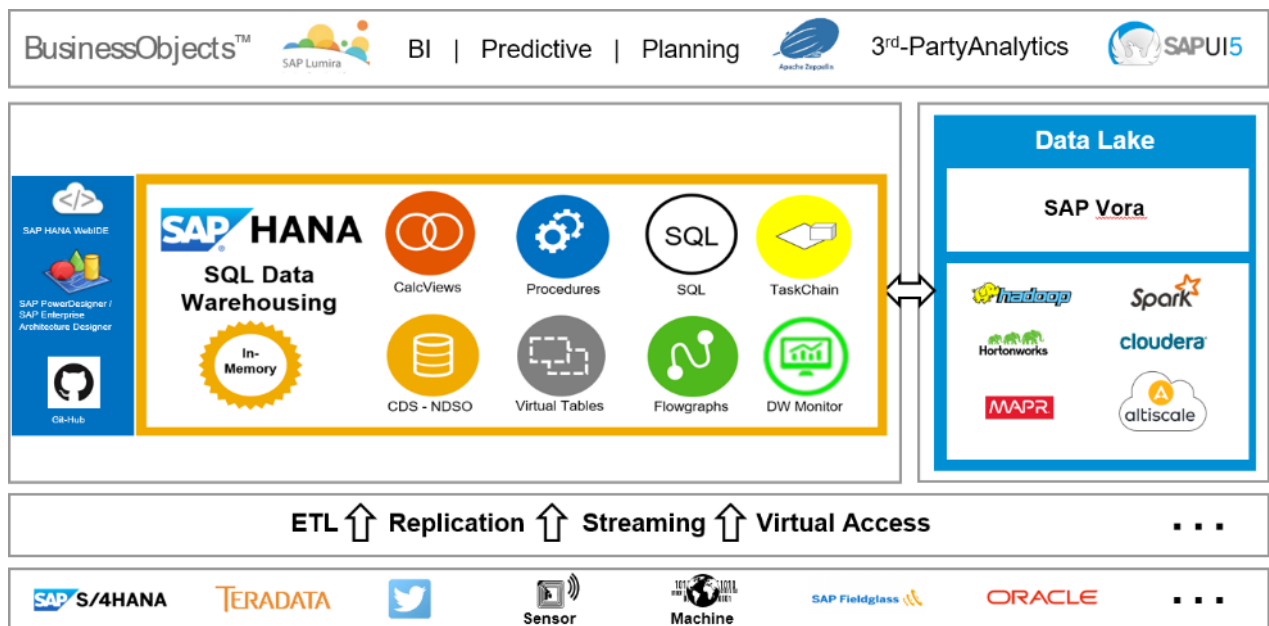
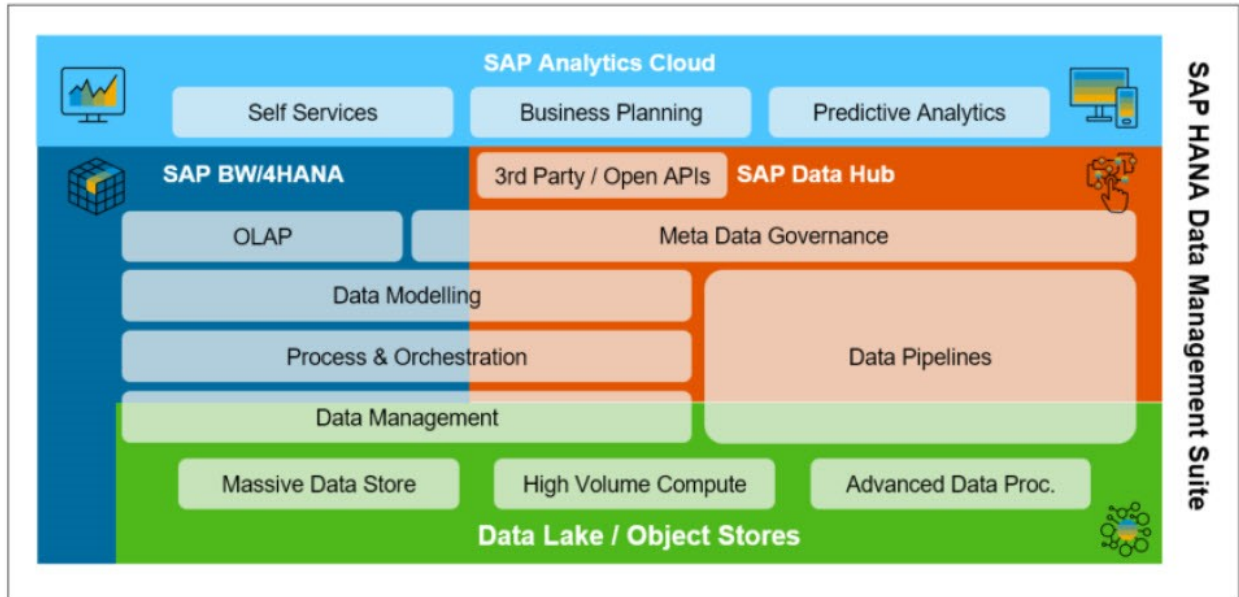
6.5 BW/4 HANA and SAP Data Intelligence

Overview

<https://blogs.sap.com/2020/03/20/sap-data-intelligence-next-evolution-of-sap-data-hub/>

Blog - [Unified Data Integration for SAP](#)

SAP Data Hub Integration



6.6 SAP Analytics Cloud (SAC)

SAP Community - [SAP Analytics Cloud](#)

SAP Help - [SAP Analytics Cloud](#)

SAP Help - [Live Data Connections to SAP BW](#)

SAP Help - [What's new in SAC](#) (bi-weekly update)

Blog - [next Mystery solved – proper SAC Connection](#)

[Note 2415249 - Using SAP Analytics Cloud as Client for SAP BW queries on BW 7.50](#)

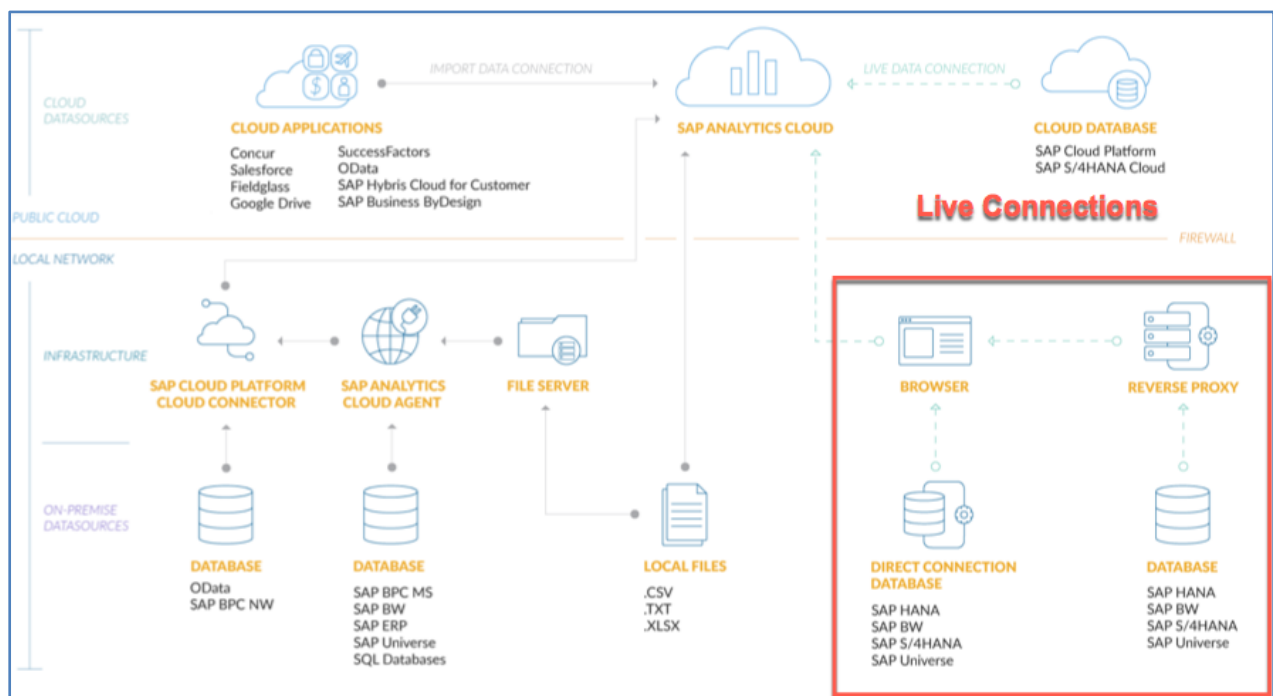
[Note 2518900 - How do I connect SAP Analytics Cloud \(BOC\) to SAP S/4HANA Cloud Identity Provider](#)

[Note 2541557 - SAP Analytics Cloud with BW live connection - Which SP is recommended?](#)

(this Note cont. a XML file with which can be applied with Z_SAP_BW_NOTE_ANALYZER)

[Note 2715030 - Considerations when using SAP BW and SAP S/4HANA Live Connections in SAC](#)

[Note 2728183 - SAP Analytics Cloud \(SAC\) releases and release information](#)



Blog - [SAP Analytics Cloud: Live Data Connection to SAP BW/4HANA](#)

Blog - [Enable BW Direct Live connections in SAC](#)



For the option “Data Connectivity - Import” you will need

- [6.6.1 Configuration SAP Cloud Connector](#)
- [6.6.2 Configuration SAP Analytics Cloud Agent](#)

For the option “Data Connectivity - Live” you will need

- [6.6.4 Configuration of Cross-Origin Resource Sharing \(CORS\)](#)

6.6.1 Configuration SAPCP Cloud Connector

SAP Analytics Cloud Help - [Installing the SAPCP Cloud Connector](#)

SAP BTP Help - [Cloud Connector for the Cloud Foundry environment](#)

Download the necessary Software from here - <https://tools.hana.ondemand.com/#cloud>

Cloud Connector

The Cloud Connector is an optional on-premise component that is needed to integrate on-demand applications with customer backend services and is the counterpart of SAP Connectivity service.

For more information, see the [Cloud Connector documentation](#).

Note: The Portable archives for Cloud Connector are meant for non-productive scenarios only. They can be used even if you don't have administrator permissions on the machine, on which you like to use the Cloud Connector. However, those variants do not support upgrades from previous versions.

Available Cloud Connectors

Operating System*	Architecture	Version	File Size	Download
Linux	ppc64le	2.14.0.1	73.9 MB	sapcc-2.14.0.1-linux-ppc64le.zip (sha1)
Linux	x86_64	2.14.0.1	72.2 MB	sapcc-2.14.0.1-linux-x64.zip (sha1)

SAP JVM

The SAP JVM is a prerequisite for local profiling with the SAP JVM Profiler. It is a standard compliant certified JDK, supplemented by additional supportability and developer features and extensive monitoring and tracing facilities. For more information, see the [SAP JVM documentation](#).

Available SAP JVMs

Operating System*	Architecture	Version	File Size	Download
Linux	x86_64	8.1.084	130.0 MB	sapjvm-8.1.084-linux-x64.zip (sha1)
Linux	x86_64	8.1.084	126.0 MB	sapjvm-8.1.084-linux-x64.rpm (sha1)

Component	Operation System	Architecture	Version	File Size	Download
SDI Data Provisioning Agent	Linux	x86_64	2.0 SP06 Patch 10	803.4 MB	Download Link (sha1)

Install the Cloud Connector Components

```
sap@xxxxxxxxxxxxx:/sapmnt/software/Cloud_Connector #
rpm -i sapjvm-8.1.084-linux-x64.rpm
sap@xxxxxxxxxxxxx:/sapmnt/software/Cloud_Connector #
rpm -i com.sap.scc-ui-2.14.1-8.x86_64.rpm
```

Installing Cloud Connector

search for java installations ...

Found SAP JVM 8 installation. Will use it for cloud connector.

scc_Daemon installed.

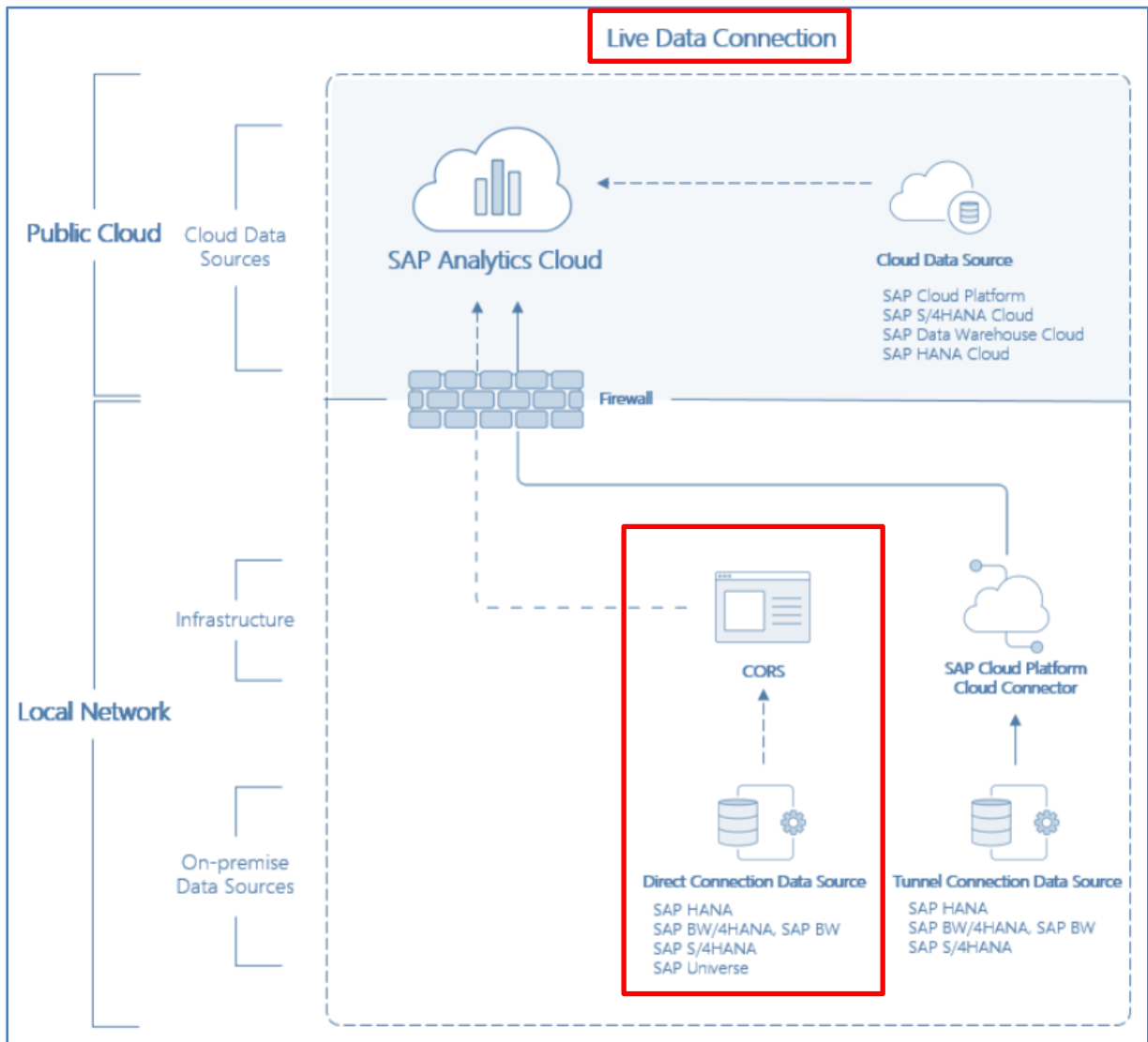
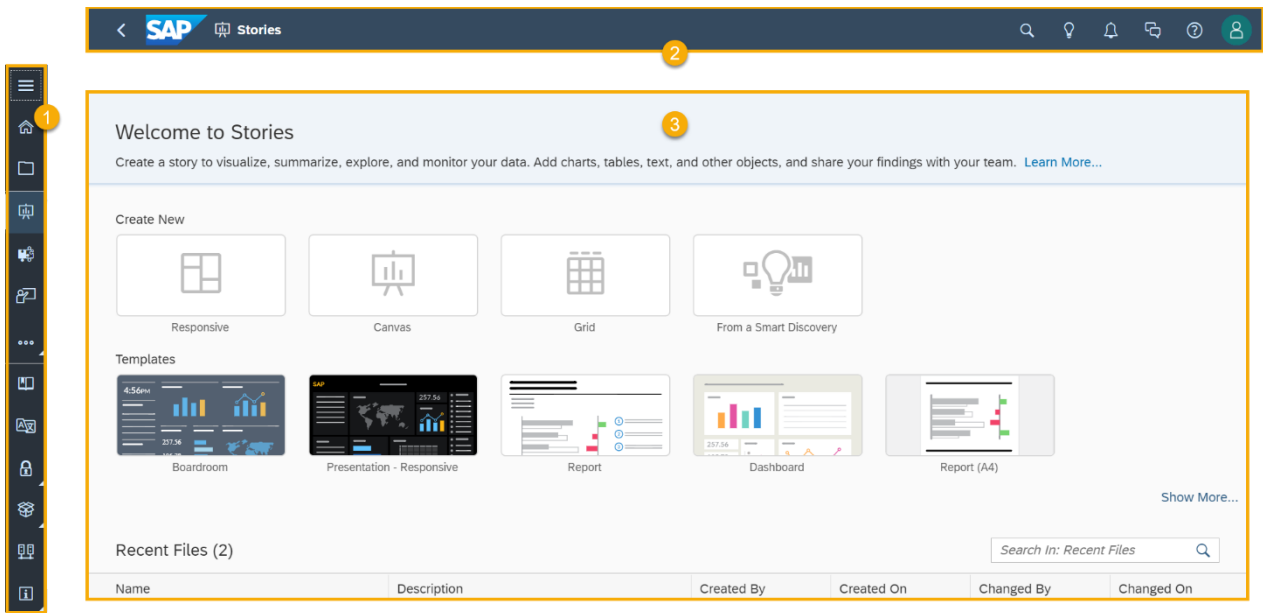
Cloud Connector server can be managed using systemctl scc_daemon start | stop
/usr/local/sbin/rcscc_daemon start | stop

Starting scc_Daemon

osgi>

scc_Daemon started.

Cloud Connector 2.14.0.1 started on <https://xxxxxxxxxxxxx.corp:8443> (master)



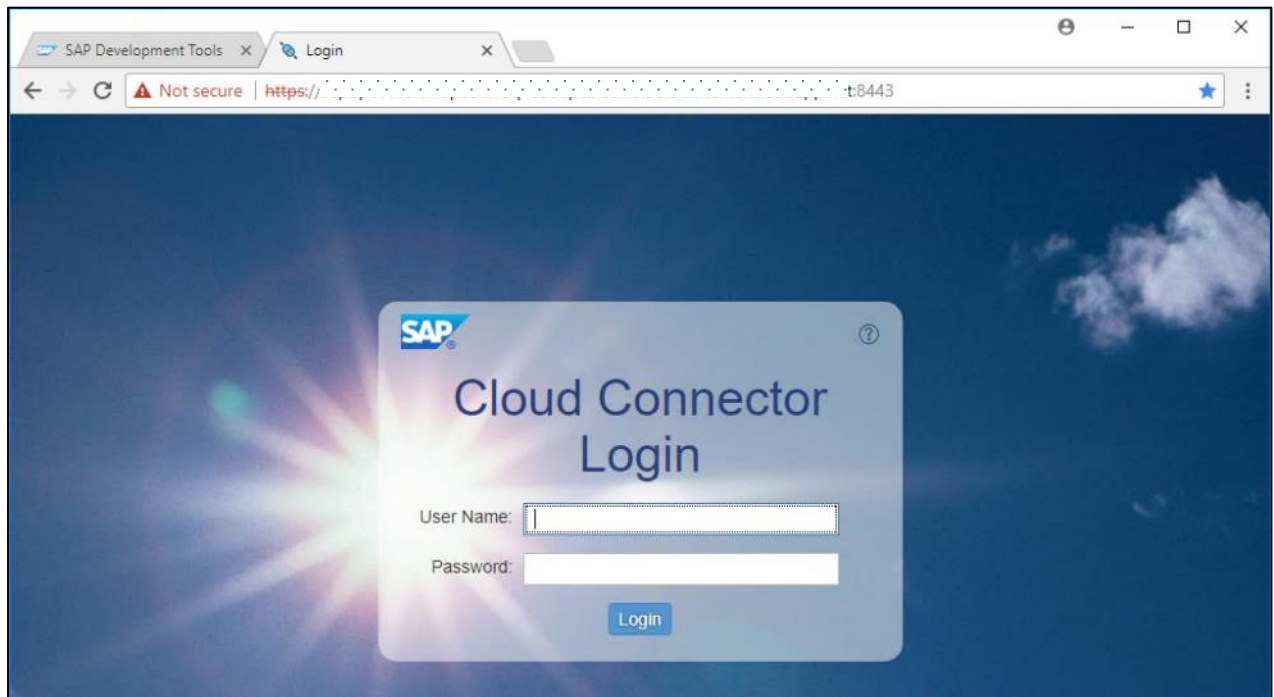
Call the Cloud Connector UI

[Note 2958529 - Connection to administration UI of Cloud Connector fails](#)

Add/Check the following line to the file `/opt/sap/scc/props.ini`

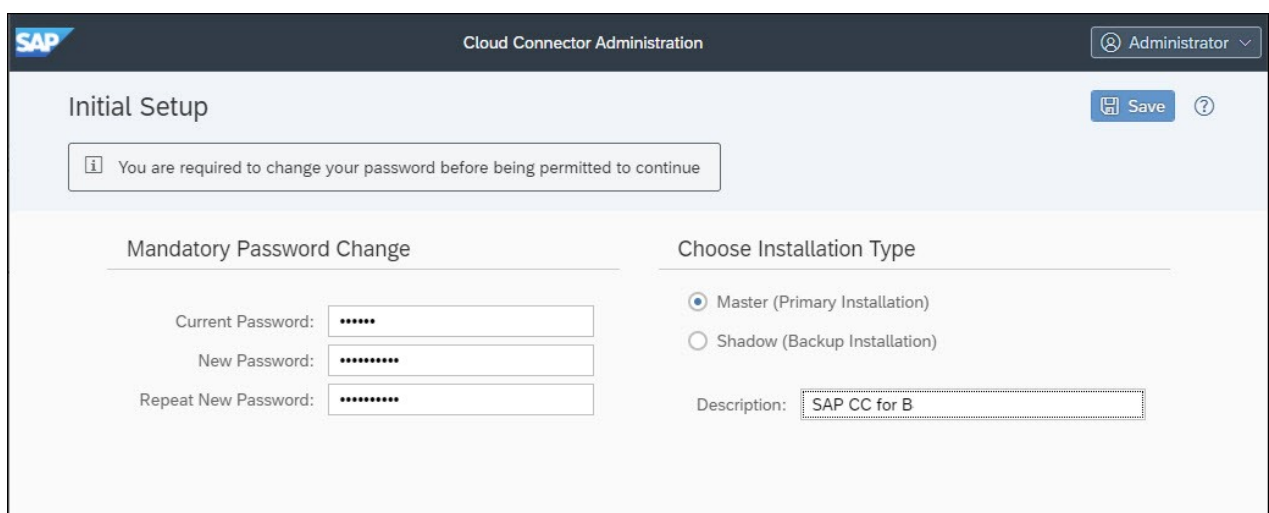
```
-Djdk.tls.server.protocols=TLSv1.2
```

<https://server.domain.ext:8443> (Administrator/manage)



SAP Help - [Initial Configuration](#)

Define your SAP Cloud Connector Administrator Password



Define your Subaccount from the SAP Cloud Connector to the SAP Analytics Cloud

Define Subaccount

i Cloud Connector is not configured and remains inoperative unless you define at least one subaccount

First Subaccount

Region:*

Subaccount:*

Display Name:

Login E-Mail:*

Password:*

Location ID:

Description:



Instead of the option to use the keytool as described in the [SAP Cloud Platform Help](#), you can also use the sapgenpse tool from the SAPCRYPTOLIB8 Package to do so.

SAP Help - [Configuring SSO for the SAP Host Agent on UNIX - SAP Help Portal](#)

SAP Help - [Recommended Locations of Files - SAP Help Portal](#)

SAP Help - [Installing SAP Host Agent from the Command Line - SAP Help Portal](#)

SAP Help - [The SAP Cryptographic Library Installation Package - SAP Help Portal](#)

[Note 1848999 - Central Note for CommonCryptoLib 8 \(replacing SAPCRYPTOLIB\)](#)

[Note 2631190 - Download location of SSL certificates required for Support Hub Connectivity conf.](#)

Steps to do:

- sapgenpse gen_pse -p server_scc.pse -x changeit -r server_scc.p10
"CN=server.domain.ext O=Company, C=DE"
- sapgenpse seclogin -p server_scc.pse -x changeit -O root
- server_scc.p10 → [sending to CA](#) → server_scc_cr.p7b
- sapgenpse import_own_cert -p server_scc.pse -x changeit -c server_scc_cr.p7b
- sapgenpse get_my_name -p server_scc.pse -x changeit -v
- sapgenpse export_p12 -p server_scc.pse -x changeit -v server_scc.p12

SAP Help - [Configure a Secure Login Server - Implementation](#) –

Blog - [SAP Secure Login Server - your own CA on Hand...](#)

SAP Help - [Find Your Subaccount ID](#) (Cloud Foundry Environment)

[Note 2571763 - Authorization problem in SAP Cloud Conn. when adding Cloud Foundry subaccount](#)

[Note 2731253 - Europe Frankfurt regions for subaccounts in SAP Cloud Connector](#)

[Note 2987604 - SAP_COM_0200 - Error validating user in HCP \(401, Unauthorized\)](#)

[Note 2620478 - Download Service: Trust anchor certificates required for software & notes downloads](#)

Subaccount: Azure - Overview

Subaccount for

General Cloud Foundry Environment Entitlements

20 Entitlements 4 Instances and Subscriptions

Subdomain: i00	Provider: Microsoft Azure	Used for Production: Yes	Created On: 9 Nov 2020, 1
Tenant ID: 825bcf	Region: Europe (Netherlands)	Beta Features: Enabled	Modified On: 13 May 2021
Subaccount ID: 825bc	Environment: Multi-Environment		

Cloud Foundry Environment

API Endpoint: <https://api.cf.eu20.hana.ondemand.com>

Org Name: **i00**

Org ID: **a2040**

Manage environment instance

Spaces (2)

Name	Applications	Service In
ic_01	0	3
id_02	0	0

Subaccount: **i00**

i00 Disconnect

Connected since February 9, 2022 1:10:22 PM CET — no active resources available (check Cloud To On-Premise/Access Control)

Subaccount Overview

Region: Europe (Netherlands) - Azure	Subaccount: 825bc
Region Host: cf.eu20.hana.ondemand.com	33d2
HTTPS Proxy: ◇	Initiated By: roland.kramer@sap.com
Subaccount Certificate: ◇ Certificate valid until February 9, 2023 1:10:07 PM CET	Location ID:
System Certificate: ◇	Description:

Disaster Recovery Subaccount

SAP Help - [Recommendations for Secure Setup](#)

Security Status
?

Low risk

General Security Status

Status	Area	Description	Actions
✔	UI Certificate	Certificate configured: CN=lt .corp, OU=SAP CC, O=SAP, C=DE	>
✔	Cipher Suites	All enabled ciphers are considered secure	>
✔	Trust Store	OK	>
⚠	Authentication	Configure local LDAP for authentication of Cloud Connector users	>
✔	CPIC Trace	Trace is off	>

Subaccount-Specific Security Status

Display Name	Application Allowlist	Payload Trace
iOC	✔ Application allowlist not supported	✔ Trace is off

SAP Help - [Exchange UI Certificates in the Administration UI](#)

UI Certificate

📄
↑
📄
i
?

Subject DN: CN=sap .azure.com Subject Alternative Names

Issuer: CN=Let's Encrypt Authority X3, O=Let's Encrypt, C=US

Valid From: Nov 11 15:37:44 2020 CET

Valid To: Feb 9 15:37:44 2021 CET

Type	Value
DNS	sap .azure.com

Generate CSR

Subject DN

*Common Name (CN): .azure.com

E-Mail Address (EMAIL):

Locality (L):

Organizational Unit (OU):

Organization (O):

State or Province (ST):

Country (C):

Subject Alternative Names

Type	Value	Actions
RFC8...	<input type="text" value="roland.kramer@sap.com"/>	🗑
DNS	<input type="text" value="sap .azure.com"/>	🗑

Generate
Cancel

File name:

Save as type: PEM File (*.pem)

6.6.2 Configuration Analytics Cloud Agent

SAP Help - [Installing SAP Analytics Cloud Agent](#)

Download the necessary Software from – <https://launchpad.support.sap.com/#/softwarecenter>

[Note 2551072 - How to download the SAP Analytics Cloud Agent for SAP Analytics Cloud \(BOC\)](#)

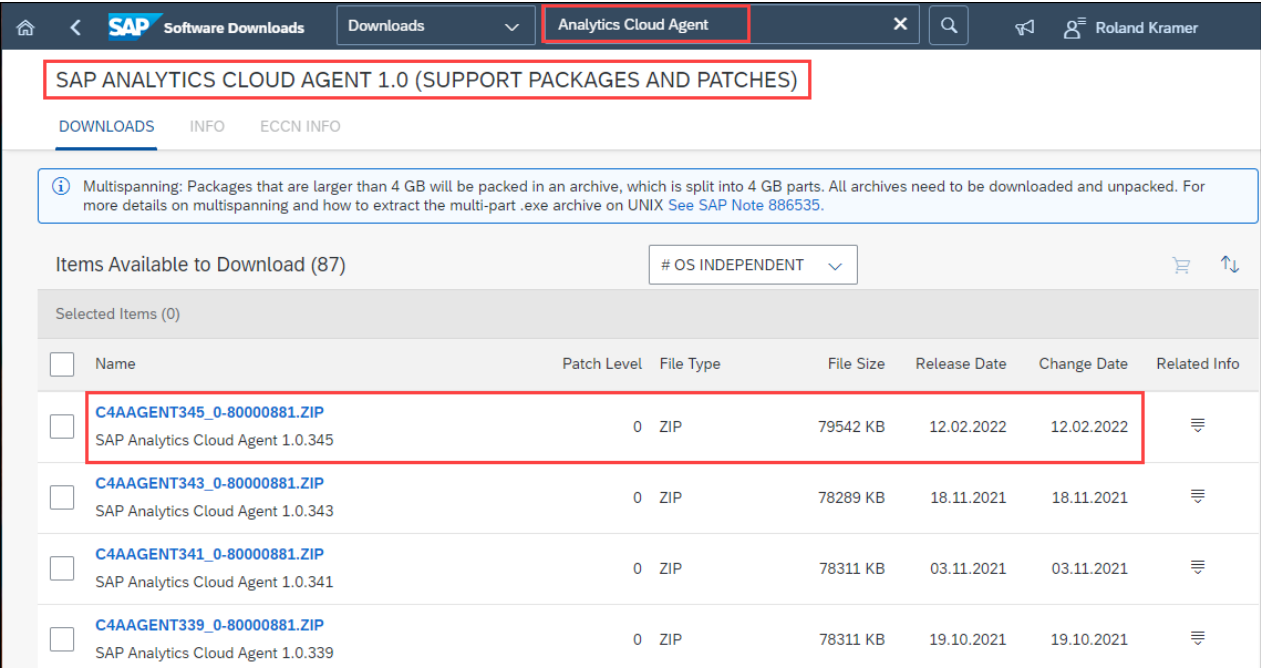
[Note 3107426 - SAP Analytics Cloud agent kit 1.0.339](#)

[Note 3107438 - SAP Analytics Cloud agent 1.0.339](#)

[Note 3116989 - SAP Analytics Cloud agent 1.0.343](#)

[Note 3136559 - SAP Analytics Cloud agent 1.0.345](#)

[Note 3164356 - SAP Analytics Cloud agent 1.0.347](#)



SAP ANALYTICS CLOUD AGENT 1.0 (SUPPORT PACKAGES AND PATCHES)

DOWNLOADS INFO ECCN INFO

ⓘ Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See SAP Note 886535.

Items Available to Download (87) # OS INDEPENDENT

Selected Items (0)

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	C4AAGENT345_0-80000881.ZIP SAP Analytics Cloud Agent 1.0.345	0	ZIP	79542 KB	12.02.2022	12.02.2022	☰
<input type="checkbox"/>	C4AAGENT343_0-80000881.ZIP SAP Analytics Cloud Agent 1.0.343	0	ZIP	78289 KB	18.11.2021	18.11.2021	☰
<input type="checkbox"/>	C4AAGENT341_0-80000881.ZIP SAP Analytics Cloud Agent 1.0.341	0	ZIP	78311 KB	03.11.2021	03.11.2021	☰
<input type="checkbox"/>	C4AAGENT339_0-80000881.ZIP SAP Analytics Cloud Agent 1.0.339	0	ZIP	78311 KB	19.10.2021	19.10.2021	☰

SAP Help

- [Installing the SAP Java Connector \(JCO\)](#)
- [Live Data Connections to SAP BW and SAP BW/4HANA](#)

6.6.2.1 Tomcat 9.0 Installation

SAP Help - [Java Web Tomcat 9](#)

[Note 1648573 - How to configure SSL/TLS on Tomcat in BI 4.x](#)

Install the Web Server - Make yourself familiar with the Tomcat Distribution -

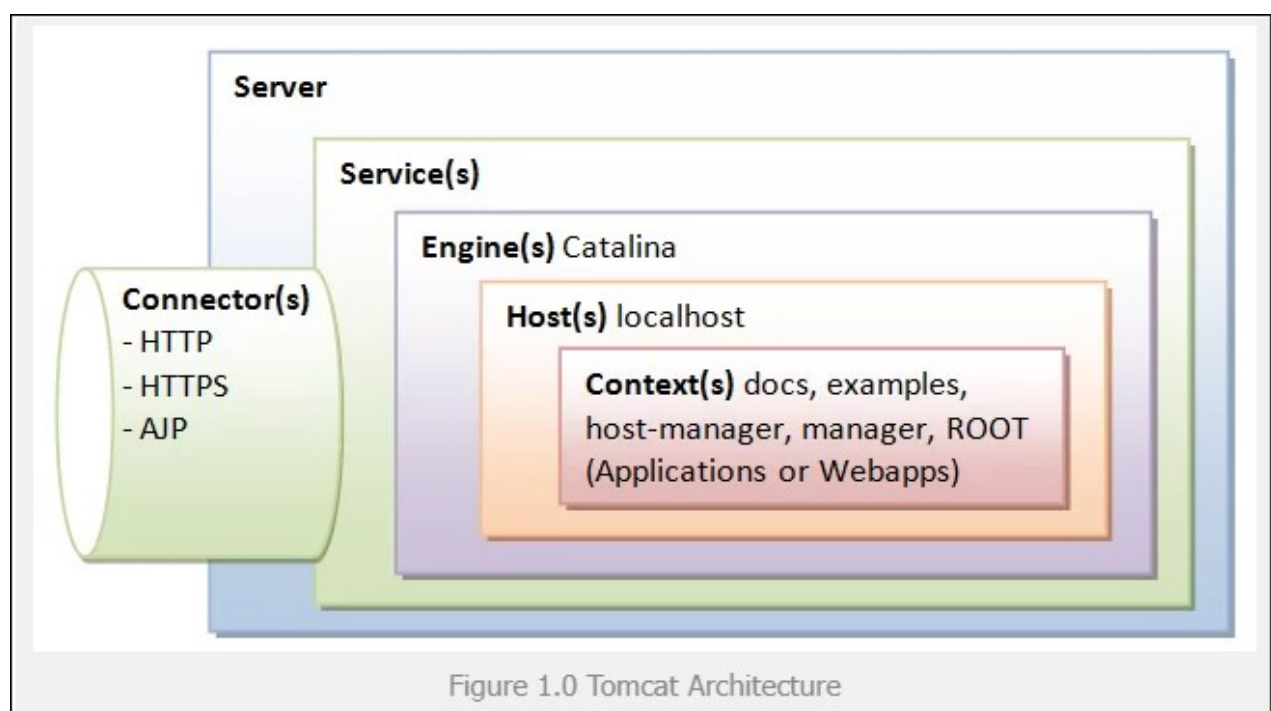
<http://tomcat.apache.org/whichversion.html> and Download the latest [Tomcat 9.0 Version](#) (eg. 9.0.60)

Log on as a user with root authorization.

Change to the directory to which you downloaded the file `apache-tomcat-9.0.60.tar.gz`

Extract `apache-tomcat-9.0.60.tar.gz` to `/opt`

```
server:/opt # tar -xvf /sapmnt/software/apache-tomcat-9.0.60.tar.gz
```



Create the file `setenv.sh` at the location `$CATALINA_BASE/bin` to ensure the correct location of the environment or edit the file `.bashrc` from the Tomcat user.

```
CAROOT=/opt/apache-tomcat-9.0.58/sec
CATALINA_BASE=/opt/apache-tomcat-9.0.58/
CATALINA_HOME=/opt/apache-tomcat-9.0.58/
JAVA_HOME=/opt/sap/sapmachine-jdk-11.0.14.1/
JRE_HOME=/opt/sap/sapmachine-jdk-11.0.14.1/
LD_LIBRARY_PATH=/opt/apache-tomcat-9.0.58/lib:/opt/openssl/lib
PATH=/opt/sap/sapmachine-jdk-11.0.14.1/bin:/opt/openssl/bin:/
```

You can also use additional SAP standard tools like SapMachine 11 and SAPCryptoLib 8, simply allow the Tomcat Installation user to find them, e.g. in `.bashrc`

6.6.2.2 Enable SSL/TLS support on Tomcat 9.0

Create the directory `/opt/apache-tomcat-9.0.60/sec`

There are different tools you can use here, and you have to make sure that the Tomcat user find's them accordantly, like `keytool`, `mkcert`, `openssl`, (`sapgenpse`)

Get the program "`mkcert`" from - <https://github.com/FiloSottile/mkcert>

The tool `mkcert` creates several files automatically, instead of using several other tools for this task.

Create a keystore file to store the server's private key and self-signed certificate by executing the following command and specify a password value of "`changeit`":

```
$CATALINA_HOME/sec/ mkcert -CAROOT
```

```
/opt/apache-tomcat-9.0.60/sec
```

```
$CATALINA_HOME/sec/ mkcert rootCA
```

```
$CATALINA_HOME/sec/ mkcert -csr server.domain.ext.csr
```

```
keytool -certreq -alias server.tomcat9 -keyalg RSA -file server.domain.ext.csr  
-keystore server.keystore.jks -ext SAN=dns:server.domain.ext
```

```
keytool -importcert -alias root -file rootCA.pem -keystore server.keystore.jks
```

```
keytool -genkey -v -keyalg RSA -alias tomcat -keypass changeit -keystore  
rootCA -storepass changeit -dname "CN=server.domain.ext, OU=SAP_CA, O=SAP"
```

```
keytool -selfcert -v -keystore server.keystore.jks -alias tomcat -storepass  
changeit
```

In case the certificate `server.domain.ext.csr` cannot be imported to the Key Store you can use `openssl` to convert it. Use the `keytool` to import Root Certificates as well.

```
$CATALINA_HOME/sec/ openssl -in server.domain.ext.csr -out  
server.domain.ext_new.csr
```

```
keytool -import -alias DigiCertGlobalRootCA -keystore server.keystore.jks -  
trustcacerts -file DigiCertGlobalRootCA.crt
```

```
keytool -import -alias SAPGlobalRootCA -keystore server.keystore.jks -  
trustcacerts -file SAPGlobalRootCA.crt
```

```
keytool -import -alias server -keystore server.keystore.jks -trustcacerts -  
file server.domain.ext.pem
```

6.6.2.3 Adapt the configuration file on Tomcat 9.0

Change to the directory `/opt/apache-tomcat-9.0.60/conf` and edit the file `server.xml`

There are several settings to change:

- Tomcat Server port(s)
- Connector port for HTTP and HTTPS
- Connector Port for APJ/1.3

The following Example starts the Tomcat 9.0 server on port 8005 with can be accessed at port 1080 (HTTP) and redirected to port 1443 (HTTPS)

Blog - [SapMachine and SAP HANA Studio](#)

[Note 3144530 - SAP JVM 8.1 Patch Collection 85 \(build 8.1.085\)](#)

```

<Server port="8005" shutdown="SHUTDOWN">
  <Listener className="org.apache.catalina.startup.VersionLoggerListener" />
  <Listener className="org.apache.catalina.core.JreMemoryLeakPreventionListener" />
  <Listener className="org.apache.catalina.mbeans.GlobalResourcesLifecycleListener" />
  <Listener className="org.apache.catalina.core.ThreadLocalLeakPreventionListener" />

  <GlobalNamingResources>
    <Resource name="UserDatabase" auth="Container"
      type="org.apache.catalina.UserDatabase"
      description="User database that can be updated and saved"
      factory="org.apache.catalina.users.MemoryUserDatabaseFactory"
      pathname="conf/tomcat-users.xml" />
  </GlobalNamingResources>

  <Service name="Catalina">

    <Executor name="tomcatThreadPool" namePrefix="catalina-exec-"
      maxThreads="200" minSpareThreads="4"/>

    <!-- A "Connector" represents an endpoint by which requests are received
         and responses are returned. Documentation at
         APR (HTTP/AJP) Connector: /docs/apr.html
         Define a non-SSL/TLS HTTP/1.1 Connector on port 1080
    -->
    <Connector port="1080" protocol="HTTP/1.1" connectionTimeout="20000"
      redirectPort="1443" address="0.0.0.0"/>
    <!--
    <Connector executor="tomcatThreadPool" port="1080" protocol="HTTP/1.1"
      connectionTimeout="20000" redirectPort="1443" />
    -->
    <Connector port="1443" SSLEnabled="true" scheme="https" secure="true"
      maxThreads="50" minSpareThreads="10" compression="on"
      protocol="org.apache.coyote.http11.Http11NioProtocol"
      sslImplementationName="org.apache.tomcat.util.net.jsse.JSSEImplementation">
    <SSLHostConfig protocols="TLSv1.2,TLSv1.3" sslProtocol="TLSv1.2">
    <Certificate certificateKeystoreFile="sec/lt5087.keystore.jks"
      certificateKeystorePassword="changeit"/>
    </SSLHostConfig>
    <UpgradeProtocol className="org.apache.coyote.http2.Http2Protocol" />
  </Connector>

    <Connector protocol="AJP/1.3" port="1009" redirectPort="1443" />

  <Engine name="Catalina" defaultHost="localhost" >

    <Realm className="org.apache.catalina.realm.LockOutRealm">
    <Realm className="org.apache.catalina.realm.UserDatabaseRealm"
      resourceName="UserDatabase"/> </Realm>

    <Host name="localhost" appBase="webapps" unpackWARs="true" autoDeploy="true">

    <Valve className="org.apache.catalina.authenticator.SingleSignOn" />
    <Valve className="org.apache.catalina.valves.AccessLogValve" directory="logs"
      prefix="localhost_access_log" suffix=".txt"
      pattern="%h %l %u %t %r %s %b" />

    </Host>
  </Engine>
</Service>
</Server>

```

The start/stop commands for Tomcat 9.0 can be found in the directory

You can use the script `./configtest` to check the Setup before launching it.

`/opt/apache-tomcat-9.0.60/bin`

```

/opt/apache-tomcat-9.0.58/bin # dir
total 828
-rwxrwxrwx 1 root sapsys 34779 Jan 15 15:37 bootstrap.jar
-rwxrwxrwx 1 root sapsys 1664 Jan 15 15:37 catalina-tasks.xml
-rwxrwxrwx 1 root sapsys 25294 Jan 15 15:37 catalina.sh
-rwxrwxrwx 1 root sapsys 1997 Jan 15 15:37 ciphers.sh
-rwxrwxrwx 1 root sapsys 207420 Jan 15 15:37 commons-daemon-native.tar.gz
-rwxrwxrwx 1 root sapsys 25357 Jan 15 15:37 commons-daemon.jar
-rwxrwxrwx 1 root sapsys 1922 Jan 15 15:37 configtest.sh
-rwxrwxrwx 1 root sapsys 9100 Jan 15 15:37 daemon.sh
-rwxrwxrwx 1 root sapsys 1965 Jan 15 15:37 digest.sh
-rwxrwxrwx 1 root sapsys 3382 Jan 15 15:37 makebase.sh
-rwxrwxrwx 1 root sapsys 3708 Jan 15 15:37 setclasspath.sh
-rwxrwxrwx 1 root sapsys 476 Feb 13 15:22 setenv.sh
-rwxrwxrwx 1 root sapsys 1902 Jan 15 15:37 shutdown.sh
-rwxrwxrwx 1 root sapsys 1904 Jan 15 15:37 startup.sh
-rwxrwxrwx 1 root sapsys 47110 Jan 15 15:37 tomcat-juli.jar
drwxrwxr-x 8 root sapsys 4096 Aug 26 16:54 tomcat-native-1.2.31-src
-rwxrwxrwx 1 root sapsys 428057 Jan 15 15:37 tomcat-native.tar.gz
-rwxrwxrwx 1 root sapsys 5540 Jan 15 15:37 tool-wrapper.sh
-rwxrwxrwx 1 root sapsys 1908 Jan 15 15:37 version.sh
/opt/apache-tomcat-9.0.58/bin #

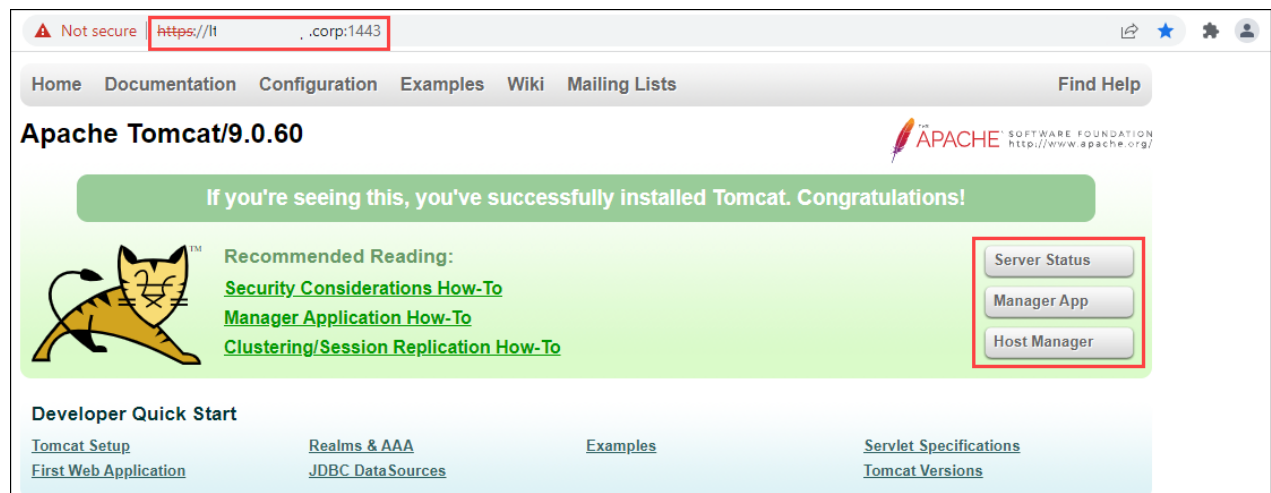
```

Start the Tomcat Web Application Manager as follows

<https://server.domain.ext:1443/>

<https://server.domain.ext:1443/manager/text/vminfo>

<https://server.domain.ext:1443/manager/status/all>



6.6.2.4 Deploy the Cloud Agent (WAR file)

Log on as a user with root authorization.

Change to the directory to which you downloaded the cloud agent file

Extracted the `C4AAGENT<SP-version>.zip` archive.

Copy the `C4A_AGENT.war` file to `/opt/apache-tomcat-9.0.60/webapps` directory

The war file is automatically deployed once Tomcat is restarted.

6.6.2.5 Configure the Tomcat Service Admin User

Change to the directory `/opt/apache-tomcat-9.0.60/conf` and edit the file `tomcat-users.xml`

There are several settings to change:



- Several roles for the Tomcat Administration
- At least one Administration User
- Role/User assignment for the Cloud Agent Service

```
<tomcat-users xmlns="http://tomcat.apache.org/xml"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://tomcat.apache.org/xml tomcat-users.xsd"
  version="1.0">
  <role rolename="Services"/>
  <role rolename="tomcat"/>
  <role rolename="admin-gui"/>
  <role rolename="admin-script"/>
  <role rolename="manager-gui"/>
  <role rolename="manager-script"/>
  <role rolename="manager-jmx"/>
  <role rolename="manager-status"/>
  <user username="tomcat" password="tomcat" groups="super"
  roles="admin-script,admin-gui"/>
  <user username="admin" password="tomcat" groups="super"
  roles="manager-gui,manager-status,manager-script,Services"/>
</tomcat-users>
```

To allow the access via user/password you have to maintain an addition file (manager.xml) at the following location:

Tomcat 9 Help - [HTML User-friendly Interface](#)

/opt/apache-tomcat-9.0.58/conf/Catalina/localhost/			
Name	Size	Changed	Rights
/		15.02.2022 12:46:15	rxwxrwxrwx
manager.xml	1 KB	15.02.2022 15:39:24	rw-r--r--

Tomcat Web Application Manager

Message: OK

Manager

[List Applications](#)
 [HTML Manager Help](#)
 [Manager Help](#)
 [Server Status](#)

Applications					
Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/C4A_AGENT	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

[Note 2943656 - When accessing Cloud agent getting: Access to the requested resource has been denied in SAP Analytics Cloud \(SAC\)](#)

Log on to the Tomcat Web Application Manager with your user/password combination and check the Version of the SAP Cloud Agent - https://server_domain.ext:1443/C4A_AGENT/deploymentInfo



6.6.2.6 Deploy the SAP JCo file

[Note 3115707 - SAP Java Connector Release 3.1.5](#)

Log on as a user with root authorization.

Change to the directory to which you downloaded the JCO file

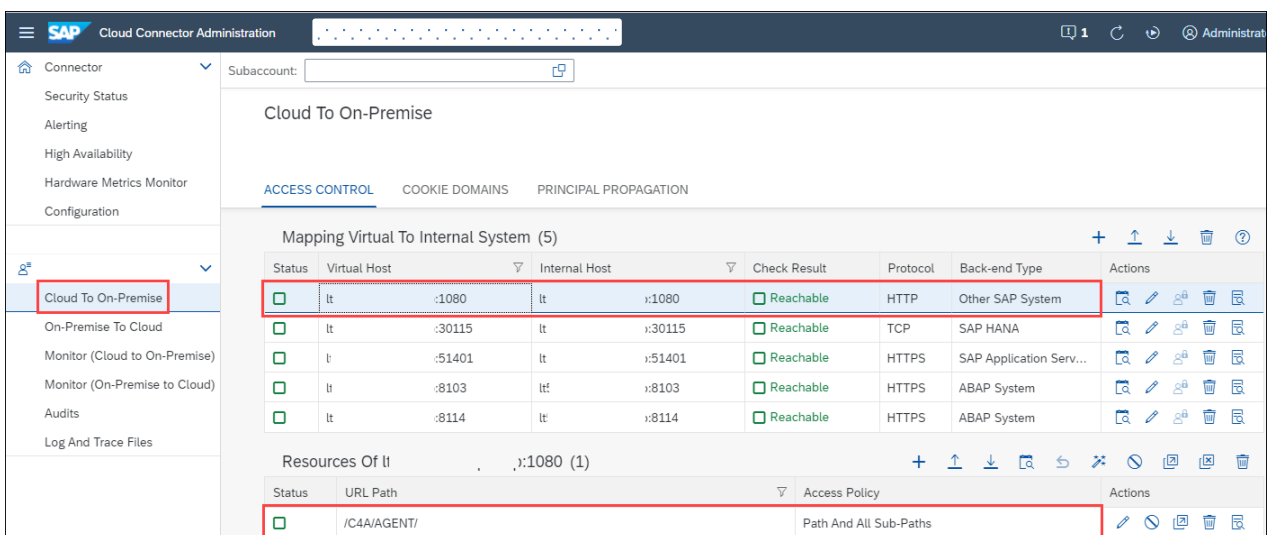
Extracted the `sapjco31P_<SP-version>.zip` archive.

Copy the files `libsapjco3.so` and `sapjco3.jar` to `/opt/apache-tomcat-9.0.60/lib`

Downloads can be found here - <https://support.sap.com/en/product/connectors/jco.html#Download>

6.6.2.7 Configure the Access Control in the SAP HCC

Logon to the SAP HANA Cloud Connector (HCC) with your User/password combination and add a System mapping-



Status	Virtual Host	Internal Host	Check Result	Protocol	Back-end Type	Actions
<input checked="" type="checkbox"/>	lt :1080	lt :1080	Reachable	HTTP	Other SAP System	[Icons]
<input checked="" type="checkbox"/>	lt :30115	lt :30115	Reachable	TCP	SAP HANA	[Icons]
<input checked="" type="checkbox"/>	lt :51401	lt :51401	Reachable	HTTPS	SAP Application Serv...	[Icons]
<input checked="" type="checkbox"/>	lt :8103	lt :8103	Reachable	HTTPS	ABAP System	[Icons]
<input checked="" type="checkbox"/>	lt :8114	lt :8114	Reachable	HTTPS	ABAP System	[Icons]

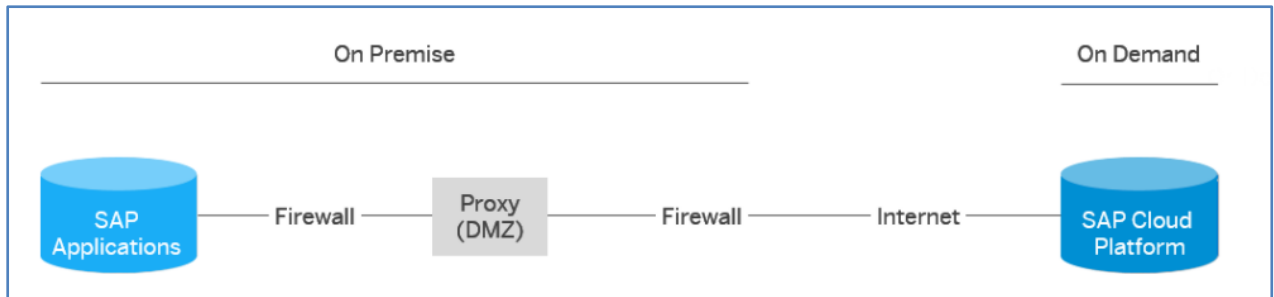
Status	URL Path	Access Policy	Actions
<input checked="" type="checkbox"/>	/C4A/AGENT/	Path And All Sub-Paths	[Icons]

SAP HANA will be connected with the (TCP) SQL Port of the HANA indexserver

Add: "Other SAP System" as HTTPS and specify your configured Tomcat server configured in [Chapter 4.6.2.3](#) and set the URL PATH: /C4A/AGENT/

6.6.3 Configuration of Reverse Proxy

SAP Help - [Connectivity via Reverse Proxy](#)



Azure Help: [Application Gateway redirect overview](#)

<https://azure.microsoft.com/en-us/services/application-gateway/>



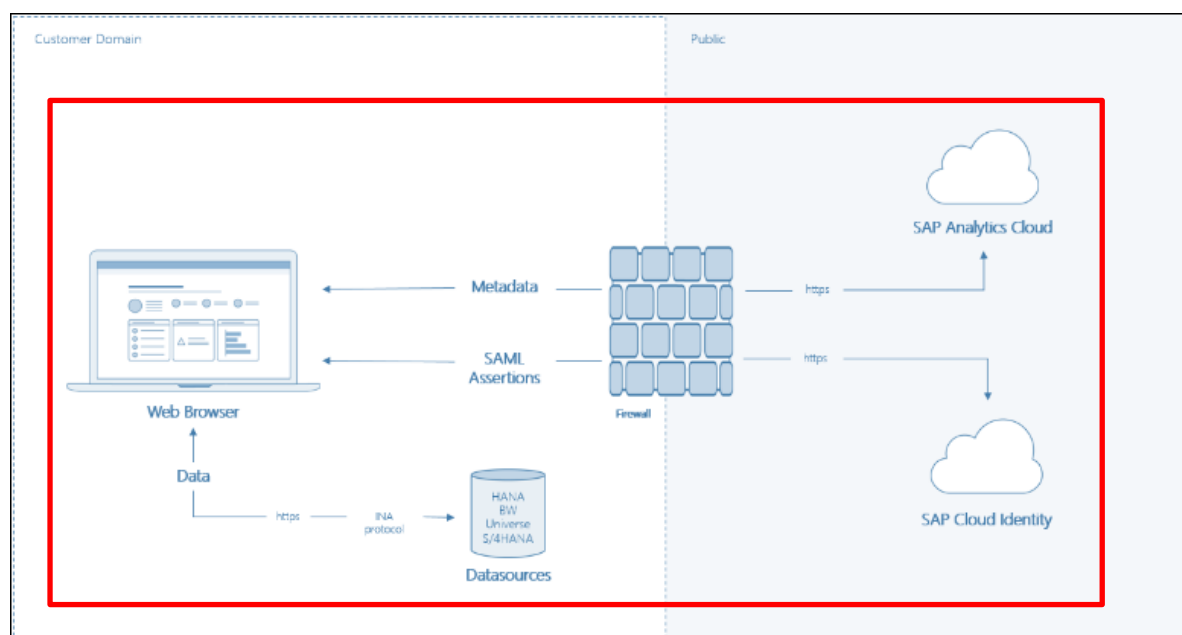
As the cross-origin resource sharing (CORS) can replace the “classical Reverse Proxy” Implementation, you will save an additional configuration of the HTTPD functionality on the Linux VM

In case you need a reverse proxy configuration anyway, you can check the following Document for this Setup with the SAP Web Dispatcher functionality.

[SAP First Guidance – complete functional scope \(CFS\) for SAP BW/4HANA](#)

6.6.4 Configuration of Cross-Origin Resource Sharing (CORS)

SAP Help: [Live Data Connections to SAP BW and SAP BW/4HANA](#)



[Note 2482807 - Secure HTTPS Browser configuration using Live Data Connections \(CORS\) in SAC](#)

[Note 2659735 - Troubleshooting CORS issues with SAP Analytics Cloud \(SAC\)](#)

[Note 1757252 - How to analyze problems related to session loss, logoff or blank screens caused by timeout issues](#) (not only CRM related)

[Cross-Origin Resource Sharing](#) (CORS) is a W3C specification that allows cross-domain communication from the browser. By building on top of the AJAX/XMLHttpRequest object, CORS allows developers to work in the same coding paradigm as with same-domain requests. CORS has started to play a more and more important role in today's web and cloud-based applications, while our web applications are trending towards system/data integration across domains. Web application servers that support CORS make it possible for a clean architecture, without using reverse proxies or other forms of middle tier.

The final CORS functionality is available from NetWeaver 7.51 and onwards.

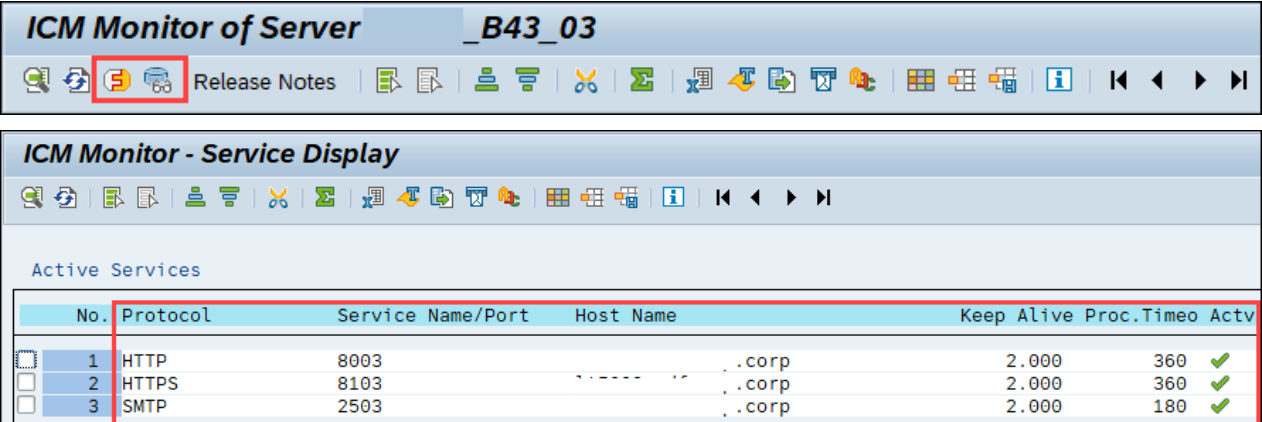
This is either available

- with the Installation of the BPC 11.0 Add-On which requires SAP_UI 7.51
- with the import of Feature Pack 01 (based on SP08) which requires SAP_UI 7.52

`icf/cors_enabled = 1` (from 7.50 onwards)

6.6.4.1 Check the TLS/SSL Settings

HTTPS availability with tx.SMICM



The screenshot shows the ICM Monitor of Server interface for server B43_03. The 'Active Services' table is highlighted with a red border and contains the following data:

No.	Protocol	Service Name/Port	Host Name	Keep Alive	Proc.Timeo	Actv
1	HTTP	8003	.corp	2.000	360	✓
2	HTTPS	8103	.corp	2.000	360	✓
3	SMTP	2503	.corp	2.000	180	✓

[Note 2694092 - HTTP error 500 from myssocntl service](#)

`login/create_sso2_ticket = 3`

`login/accept_sso2_ticket = 1`

[Note 2007212 - Tuning SAP Web Dispatcher and ICM for high load](#)

[Note 2715935 - SSO fails due to logon ticket created for a specific hostname](#)

[Note 2578923 - Collective corrections for ICF service /sap/public/myssocntl](#)

[Note 2727683 - Unable to retrieve data from the datasource error appears in SAP Analytics Cloud story based on live data connection](#)

Details of the System Profiles can be found in the Document -

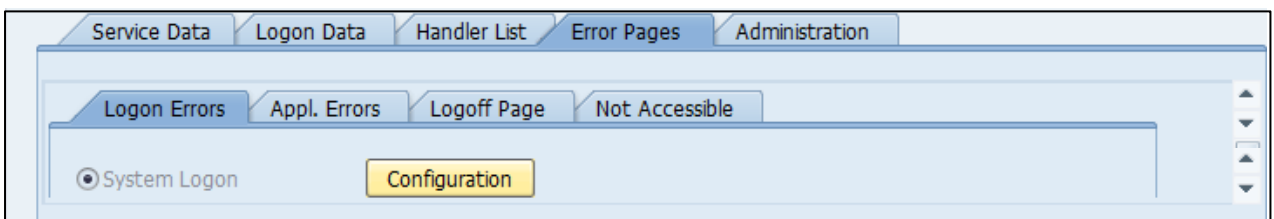
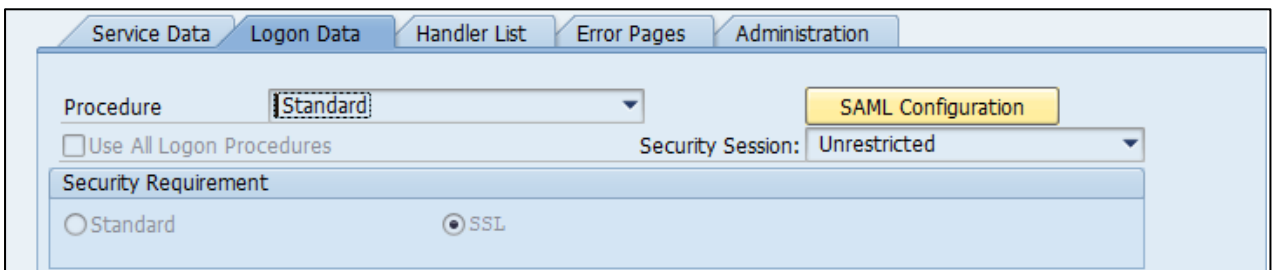
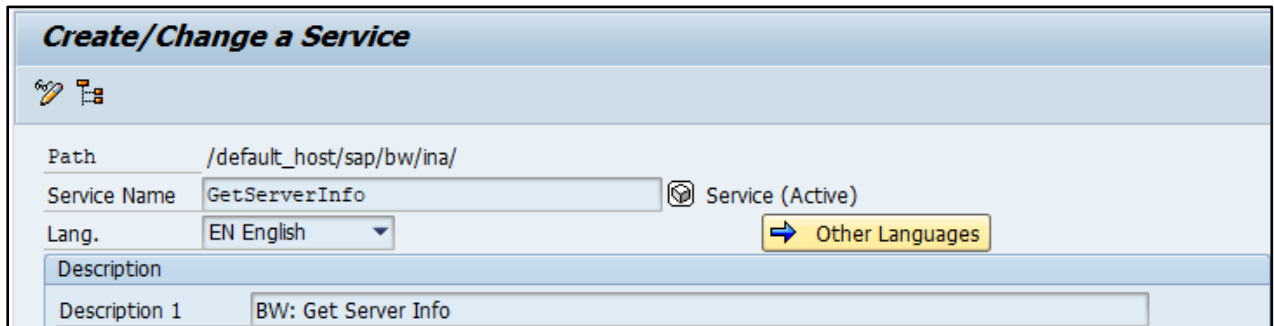
[SAP First Guidance – SAP BW on HANA – Edition 2022](#)

6.6.4.2 Check the Services GetResponse/GetServerInfo

ina	BW InA
ao	Folder for AO Endpoints
BatchProcessing	BW: BatchProcessing
ExecuteBICS	Execute BICS
GetCatalog	Catalog Service
GetResponse	BW: GetResponse
GetServerInfo	BW: Get Server Info
GetXXLValue	InA Protocol: Get values of XXL attributes
Logoff	Logoff
ValueHelp	BW Value Help

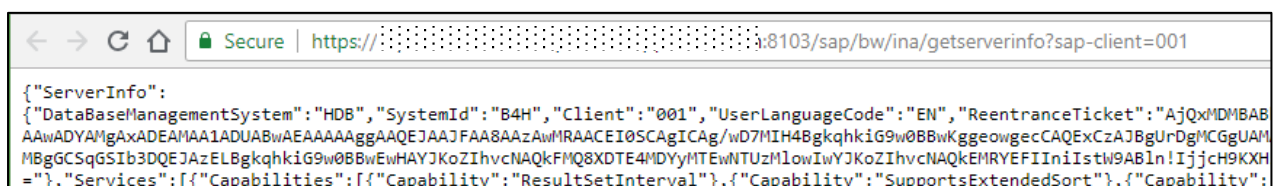
Ensure that the InA package (/sap/bw/ina/) or a higher-level package on your SAP NetWeaver system is configured for basic authentication.

Check with tx.SICF



Test the URL

https://server.domain.ext:<HTTPS Port>/sap/bw/ina/getserverinfo?sap-client=001

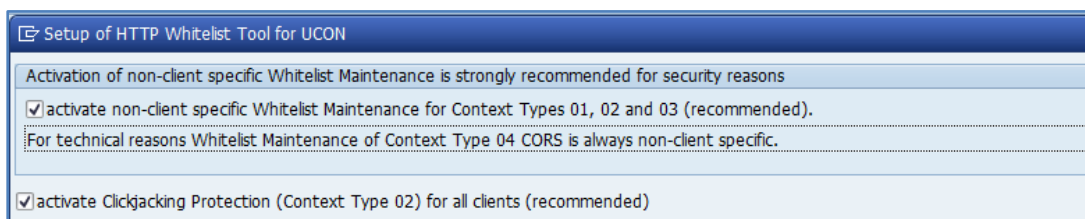
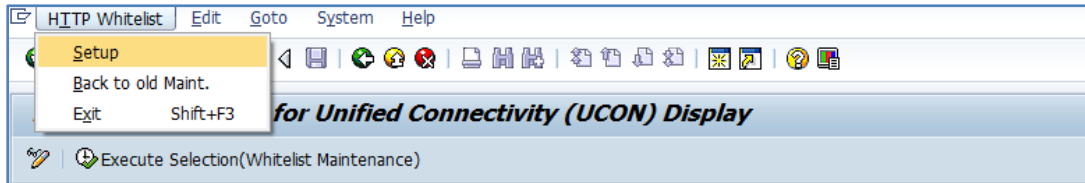


6.6.4.3 Configure the System Whitelist

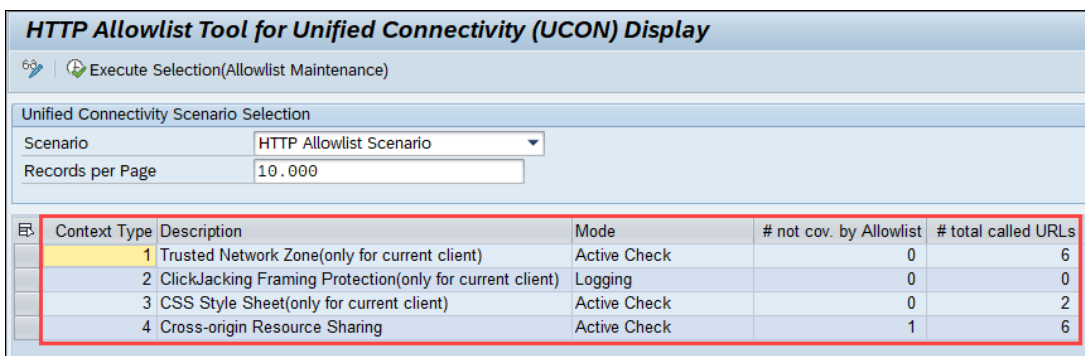
Start tx. UCONCOCKPIT or UCON_CHW in the SAP Gui

SAP Help - [Manage HTTP Allowlists](#)

SAP Analytics Cloud Help - [Live Data Connection to SAP BW Using a Direct CORS Connection](#)



During the Logging Mode” you can switch between activation of the Context Types 01 – 04



Context Type	Description	Mode	# not cov. by Whitelist	# total called URLs
1	Trusted Network Zone	Logging	2	2

Switch to 1 – Trusted Network Zone and execute Execute Selection(Whitelist Maintenance)

Switch to Edit Mode Press Refresh Coverage

In the “Trusted Network Zone” all System Internal Web URL calls are handled
Add the mandatory internal calls to the whitelist and save the entries.

[Note 2900689 – SAPGUI for HTML. WebGUI logon not working on S/4 Hana 1909](#)

[Note 2704178 - The error HTTP 500 "Redirect is not possible" occurs in /sap/public/myssocntl or in /sap/public/bc/icf/logoff](#)

HTTP Allowlist Tool for Unified Connectivity (UCON) Change

Context Type Settings
Context Type: 01 Description: **Trusted Network Zone(only for current client)**

Logged HTTP Allowlist Checks
Selection: All

To Allowlist **To No-Log-List** **Refresh Coverage**

Covered by	Scheme	Host	Port	Path
○○	https	L	8103	/sap/bc/webdynpro/sap/fpm_bics_ovp
○○	https	L	8103	/sap/bc/webdynpro/sap/oauth2_config
○○	https	L	8103	/sap/bc/webdynpro/sap/saml2
○○	http	lt	8003	/sap/bc/webdynpro/sap/rso_metadata_repository
○○	http	lt	8003	/sap/bc/webdynpro/sap/wdg_theme_info
○○	https	lt	8103	/sap/bc/ui5_ui5/sap/rspcm_web/index.html

Trusted Network Zone(only for current client) Mode: Active Check

Allowlist

Nam...	Scheme rule	Host rule	Port rule	Path rule
C	http	lt .corp	8003	/sap/bc/*
C	https	lt: .corp	8103	/sap/bc/*
C				/sap/*

Switch to 4 - Cross-origin Resource sharing and execute **Execute Selection(Whitelist Maintenance)**

Switch to Edit Mode Press **Refresh Coverage**

HTTP Whitelist Tool for Unified Connectivity (UCON) Display

Execute Selection(Whitelist Maintenance)

Unified Connectivity Scenario Selection **Select (F8)**
Scenario: HTTP Whitelist Scenario
Records per Page: 10.000

Context Type	Description	Mode	# not cov. by Whitelist	# total called URLs
1	Trusted Network Zone	Logging	5	5
2	ClickJacking Framing Protection	Logging	0	0
3	CSS Style Sheet	Logging	2	2
4	Cross-origin Resource Sharing	Active Check	39	51

In the “Cross-origin Resource Sharing” Zone (CORS) all System External and Internal (Roundtrips) Web URL calls are handled, e.g. to SAP Cloud Solution and SAP Analytic Cloud (SAC).

HTTP Allowlist Tool for Unified Connectivity (UCON) Change

Show only Allowlist

Context Type Settings
 Context Type: 04 Description: **Cross-origin Resource Sharing** Mode: Active Check

Logged HTTP Allowlist Checks
 Selection: All

To Allowlist To No-Log-List Refresh Coverage

Covered by	HTTP Service Path	Origin Host	Ge	Po	He	Pu	Pa
○○○	/sap/bw/ina/GetResponse/	master- .cloud		X			
○○○	/sap/bw/ina/GetResponse/	qrc- .cloud		X			
○○○	/sap/bw/ina/GetServerInfo/	master- .cloud	X				
○○○	/sap/bw/ina/GetServerInfo/	qrc- .cloud	X				
○○○	/sap/bw/ina/Logoff/	master- .cloud					
○○○	/sap/bw/ina/Logoff/	qrc- .cloud					

Depending on your scenario, you will see different HTTP Service URL's on the left-Hand side and corresponding Origin Hosts. Add the necessary URL to the whitelist

Client: all clients

Allowlist

Nam...	HTTP Service Path	Origin Host Rule	Ge
C	/sap/bw/ina/getresponse/	master- .i.cloud,qrc- .proje..	X
C	/sap/bw/ina/getserverinfo/	master- .cloud,qrc	X
C	/sap/bw/ina/logoff/	master- .i.cloud,t	X

Select the HTTP Service Path `/sap/bw/ina` and add to the Whitelist **To Whitelist**

Whitelist

Nam...	HTTP Service Path	Origin Host Rule	Ge	Po	He	Pu	Pa	De	Tr	Op	Co	Allowed Headers
C	/sap/bw/ina/	*.ca	loud,*eu2	to...	X	X	X	X	X	X	X	ACCEPT,ACCEPT-LANGUAGE

Modify the entry and follows and save the settings (only one entry at the time → Bug!).

- Allowed Methods: **GET , HEAD , POST , OPTIONS , PUT , DELETE , CONNECT**
- Allowed Headers: **accept , accept-language , authorization , content-type , sap-contextid , sap-rewriteurl , sap-url-session-id , sap-perf-fesrec , sap-system , x-csrf-token , x-sap-cid , x-authorization , firefly-cache-hints , firefly-invalidate-caches , cache-control , x-boe-session-token , from-ina-cache-service , mysapso2**
- Exposed Headers: **same as above**
- Allow Credentials: **x**
- Max Age: **60**



[Set Up Trust Between the Cloud Connector and Your On-Premise ABAP Systems \(BW or S/4HANA\)](#)

SAP Analytics Cloud Help - [SameSite Cookie Configuration for Live Data Connections](#)

SAP Help - [Configure Principal Propagation for HTTPS](#)

For this Functionality, you have to maintain an additional Parameter in the DEFAULT.pfl

```
icm/HTTP/mod_0 = PREFIX=/,FILE={path_to_cors_rewrite_file}
```

6.6.4.4 Additional Background Information

Additional Corrections to implement (Component BC-MID-ICF)

[Note 3059669 - Improving the performance of HTTP_CORS_LOG and HTTP_LOG_LIST update](#)

[Note 3087254 - \[CVE-2021-40496\] Improper Access Control in SAP NetWeaver AS ABAP](#)

[Note 3138312 - UCON_CHW - Entries cannot be moved to the Whitelist](#)

Additional Corrections to implement (Component BC-SEC-LGN)

[Note 2544795 - Improvements for SAML2_CLEANUP_CACHES](#)

[Note 3129068 - IdP metadata upload with automatic renewal of Primary Signing Certificate in tx SAML2](#)

[Note 3131742 - SAML2_IDP: Replace "User UUID" w. "Global User ID" 2](#)

Additional Corrections to implement (Component BC-SEC-LGN-SML)

[Note 2822876 - User gets recurring login screen with forced re-authentication](#)

[Note 2843019 - New service to show SAML 2.0 SP metadata without download](#)

[Note 2880744 - \[CVE-2020-6181\] HTTP Response Splitting vulnerability in SAP NetWeaver and ABAP Platform](#)

[Note 510007 - Additional considerations for setting up SSL on Application Server ABAP](#)

[Note 2005571 - Warnings when you logon to SAP ABAP system via HTTP](#)

[Note 2384290 - SapSSL update to facilitate TLSv1.2-only conf, TLSext SNI for 721+722 clients](#)

[Note 2462126 - AS Java UI not reach via HTTPS - ERR_CERT_COMMON_NAME_INVALID - Not Secure](#)

[Note 2923117 - SAP Cloud Platform NEO – TLS 1.2 Migration - How to address problems with old TLS protocol versions in clients of SCP](#)

[Note 2971642 - SSL Connection does not work with Chrome Browser - Issue with SAN](#)

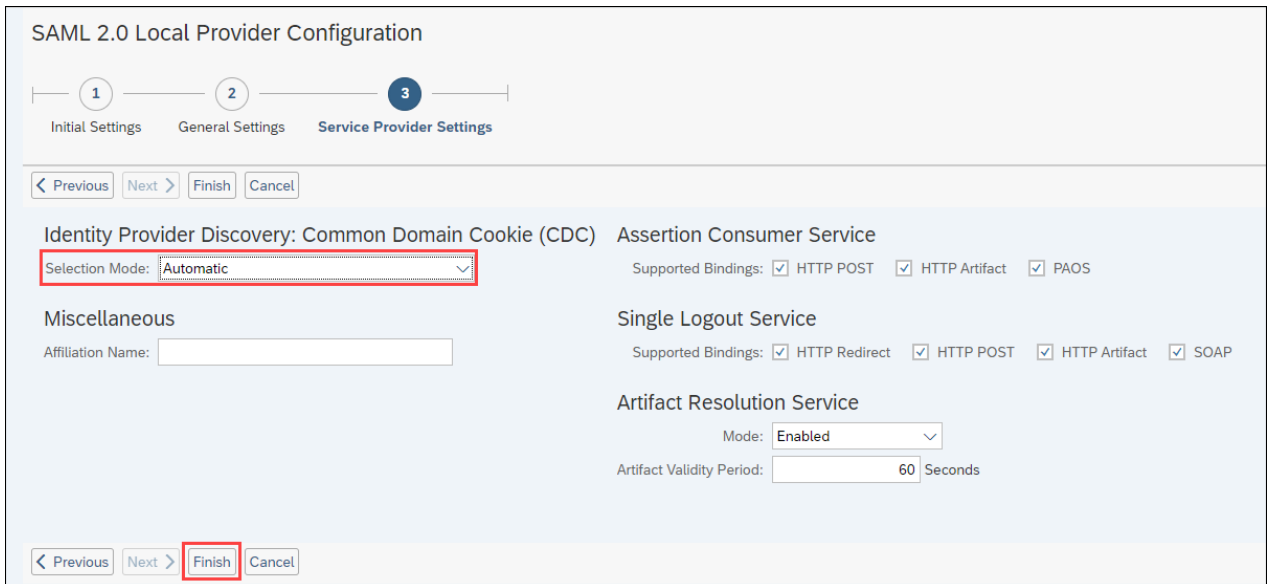
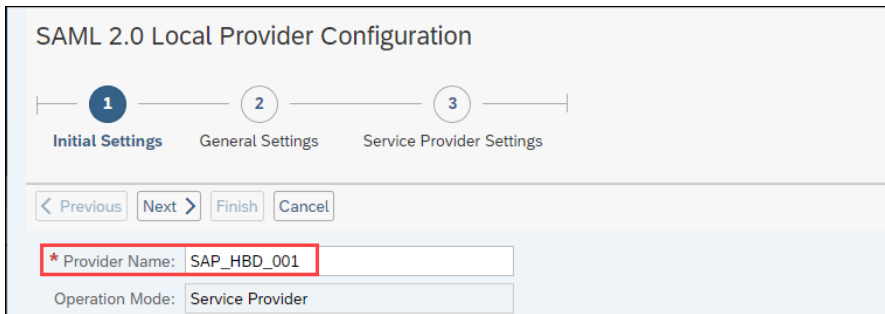
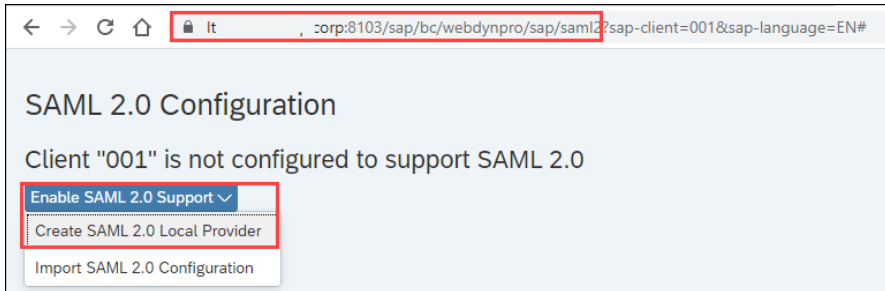
[Note 3062891 - SSSLERR_NO_SSL_REQUEST when trying to implement the parameter system/secure_communication](#)

[Note 2729853 - Web Browser warning "Connection is insecure" trying to access Fiori, WebDynpro, BSP, WebGUI, SolMan, S4/HANA or NetWeaver WebUI with https:// URL](#)

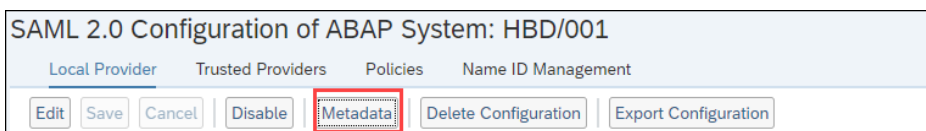
6.6.5 Activate the SAML2 Provider

[Note 2317944 - \[SSO\] SAML 2.0 Provisioning Guide - Troubleshooting Tips and Tricks - Common Errors and Resolutions](#)

Start tx. SAML2 on the ABAP Server via SAP Gui and if ICM is configured properly the WebDynpro Windows open.



Export the MetaData Configuration to share with the SAC Identity Provider (IdP)



SAML 2.0 Metadata

Choose which entity descriptor to be included in the metadata

- Service Provider
- Application Service Provider
- Security Token Service

Name	Date modified	Type	Size
metadata - orca-cf_accounts400.xml	01.02.2022 14:40	XML Document	10 KB
metadata_B43_NEW.xml	01.02.2022 12:22	XML Document	15 KB
saml2_config_B43_001.cfg	24.01.2022 15:34	CFG File	40 KB
metadata (1).xml	24.01.2022 11:39	XML Document	15 KB

Upload the updated IdP MetaData Information to the local SAML2 Provider

SAML 2.0 Configuration of ABAP System: HBD/001

Local Provider Trusted Providers Policies Name ID Management

List of Trusted Providers

Show: Identity Providers Add

Manually
Upload Metadata File

Active	Default	Name
<input type="checkbox"/>		
<input type="checkbox"/>		

Name	Date modified	Type	Size
metadata - orca-cf_accounts400.xml	01.02.2022 14:40	XML Document	10 KB
metadata_B43_NEW.xml	01.02.2022 12:22	XML Document	15 KB
saml2_config_B43_001.cfg	24.01.2022 15:34	CFG File	40 KB
metadata (1).xml	24.01.2022 11:39	XML Document	15 KB

New Trusted Identity Provider

1
2
3
4
5
6
7

Select Metadata Metadata Verification Select Providers Provider Name Signature and Encryption Single Sign-On Endpoints Single Logout Endpoints

* Metadata File: metadata - orca-cf_accounts400.xml

SAML 2.0 Configuration of ABAP System: 001 Logoff

Local Provider Trusted Providers Policies Name ID Management

List of Trusted Providers

Show: Identity Providers Edit Save Cancel Enable Add Remove

Active	Default	Name	Alias
<input checked="" type="radio"/>	<input type="radio"/>	orca-ondemand.com	IDP_Prod
<input type="radio"/>	<input type="radio"/>		
<input type="radio"/>	<input type="radio"/>		
<input type="radio"/>	<input type="radio"/>		

Details of Identity Provider "orca-ondemand.com"

Endpoints Identity Federation Signature and Encryption Authentication Requirements

Show: Single Sign-On Endpoints Add Remove

Default	Binding	Location URL
<input checked="" type="radio"/>	<input type="radio"/> HTTP Redirect	https://orca-ondemand.com/saml2/idp/sso/orca-cf.accounts400.ondemand.com
<input type="radio"/>	<input type="radio"/> HTTP POST	https://orca-ondemand.com/saml2/idp/sso/orca-cf.accounts400.ondemand.com
<input type="radio"/>		

Specify the Identity Federation (E-mail)

Details of Identity Provider "orca-ondemand.com"

Endpoints Identity Federation Signature and Encryption Authentication Requirements

Supported NameID Formats

Add Remove

Do not send NameID Policy

Default	Name	Federation Type
<input checked="" type="radio"/>	E-mail	Persistent Users
<input type="radio"/>		

Details of Identity Provider "orca-ondemand.com"

Endpoints Identity Federation Signature and Encryption Authentication Requirements

Certificates and Algorithms

Primary Signing Certificate: CN=orca-cf.accounts400.ondemand.com, O=SAP-SE, C=DE Details Browse

Secondary Signing Certificate: Details Browse

Digest Algorithm: SHA-256

Encryption Certificate: CN=orca-cf.accounts400.ondemand.com, O=SAP-SE, C=DE Details Browse

Single Sign-On Authentication Request

Sign: Always

Single Sign-On Assertions

Require Signature: Always

Single Sign-On Response

Require Signature: Never

Require Encrypted Elements: No

Logout Request and Logout Response

Sign: Always

Require Signature: Always

Encrypt elements: No

Require Encrypted Elements: No

Artifact Profile

Sign: Always

Require Signature: Always

Cross check with your Whitelist Settings in tx. UCON_CHW

Context Type Settings
Context Type: 04 Description: **Cross-origin Resource Sharing** Mode: Active Check

Whitelist

Names..	HTTP Service Path	Origin Host Rule	Ge	Po	He	Pu	Pa	De	Tr	Op	Cc
C	/sap/opu/odata4/	*	X	X	X	X	X	X	X	X	X
C	/sap/bw/ina/logoff/	*	X	X	X	X	X	X	X	X	X
C	/sap/bw/ina/	*	X	X	X	X	X	X	X	X	X
C	/sap/bw/ina/getresponse/	localhost,master									X
C	/sap/bw/ina/getserverinfo/	localhost,maste									X
C	/sap/	lt .corp	X	X	X	X	X	X	X	X	X
C	/sap/bw/ina/batchprocessing/	master- .i.cloud	X	X	X						X
C	/sap/bc/ina/service/v2/getserverinfo/	master- .bat.eu2...	X	X	X						X
C	/sap/saml2/sp/slo/001/	orca-cf.accounts400.ondemand.com	X	X	X						X
C	/sap/saml2/sp/acs/001/	orca-cf.accounts400.ondemand.com	X	X	X						X

The first connection attempt creates an entry in the “Logged HTTP Whitelist Checks”

<input checked="" type="checkbox"/>		W. JST lt5 14	BW — DIRECT Live Data	2022.02.01
-------------------------------------	--	------------------	--------------------------	------------

Context Type Settings
Context Type: 04 Description: **Cross-origin Resource Sharing** Mode: Active Check

Logged HTTP Whitelist Checks
Selection: All

	/sap/bw/ina/GetResponse/	master	projectorca.cloud	X		
	/sap/bw/ina/GetServerInfo/	master	projectorca.cloud	X		

When creating an new Model in the SAC Administration Tenant a second entry will be created

Welcome to the Modeler

Prepare your raw data using a structured view and get started with your scenario analysis. [Learn More...](#)

Models Public Dimensions Currency Conversions Points of Interest

Create New

Model

From a CSV or Excel File

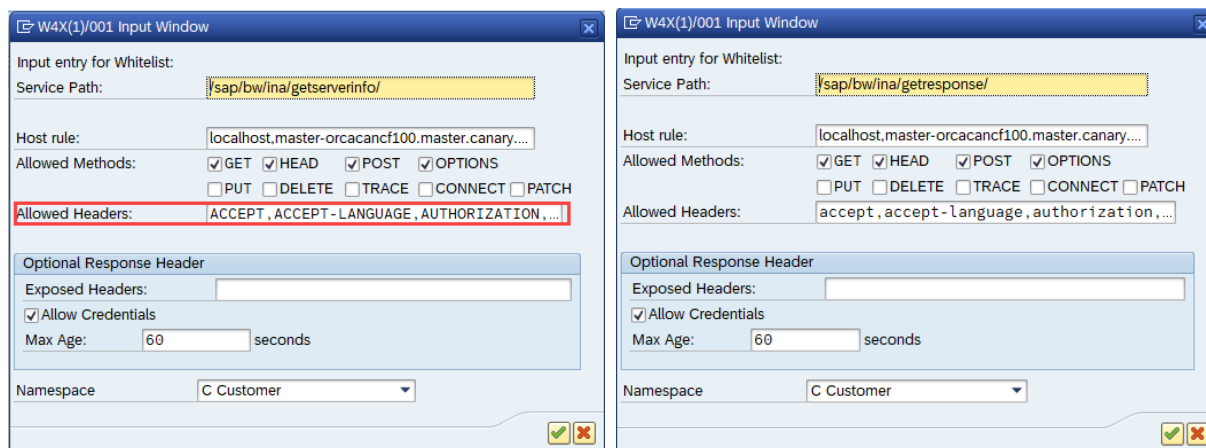
Live Data Model

From a Data Source

Both entries have to be added to the Whitelist Application of the SAP BW(/4) System.

Please Note that the Service Path “/sap/bw/ina/getserverinfo/” and “/sap/bw/ina/getresponse/” doesn't accept “*” as Wildcard . Values like “*.domain.ext” are accepted in the Host Rule Field,

To get the full cover of the White List the Service Path “/sap/bw/ina/*” must exist as well



Example of the “Logged HTTP Whitelist Checks” (tx. UCON_CHW)

Context Type Settings

Context Type: 04 Description: Cross-origin Resource Sharing Mode: Active Check

Logged HTTP Whitelist Checks

Selection: All

Covered by	HTTP Service Path	Origin Host	Ge Po
<input type="checkbox"/>	/sap/bw/ina/GetServerInfo/	master-... a.cloud	X
<input type="checkbox"/>	/sap/bw/ina/GetResponse/	master-... cloud	X
<input type="checkbox"/>	/sap/bw/ina/GetServerInfo/	master-... cloud	X
<input type="checkbox"/>	/sap/bw/ina/BatchProcessing/	master-... :orca.cloud	X
<input type="checkbox"/>	/sap/bw/ina/GetResponse/	master-... :orca.cloud	X
<input type="checkbox"/>	/sap/bc/ina/service/v2/GetServerInfo/	master-... ctorca.cloud	X
<input type="checkbox"/>	/sap/bw/ina/GetServerInfo/	master-... i.cloud	X
<input type="checkbox"/>	/sap/bw/ina/GetServerInfo/	master-... i.cloud	X

Create the INA Service - /sap/bw/ina/auth

SAP Analytics Cloud Help - [Live Data Connection to SAP BW Using a Direct CORS Connection via Unified Connectivity](#)

SAP Help - [Preparing SAML2](#)

SAP Help - [SSO with SAML2 Assertion](#)

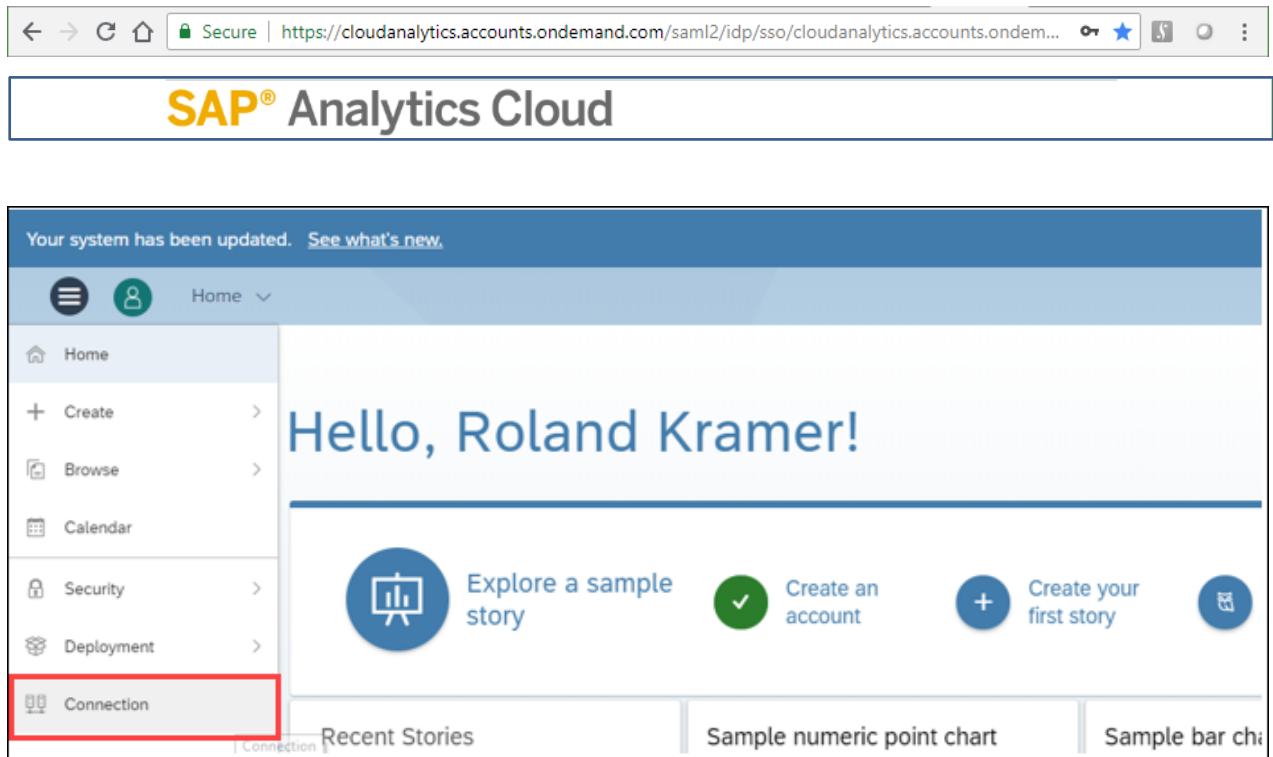
SAP Help - [SAP Gateway Host as the SAML2 Service Provider](#)

6.6.6 Connect to the SAC Application

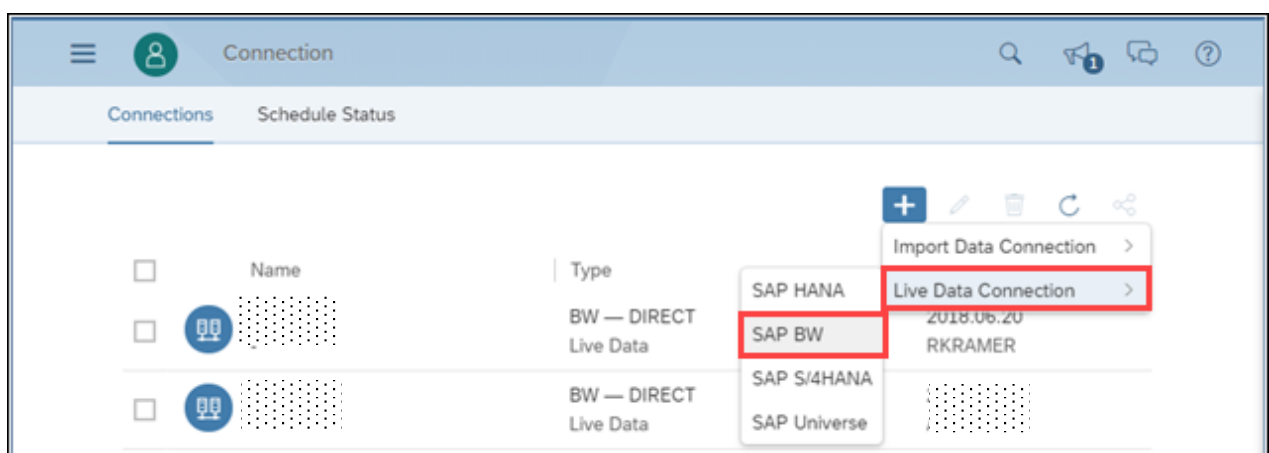
Overview - <https://www.sap.com/products/cloud-analytics.html>

SAP Analytics Cloud Help - [SAP Analytics Cloud Data Connections](#)

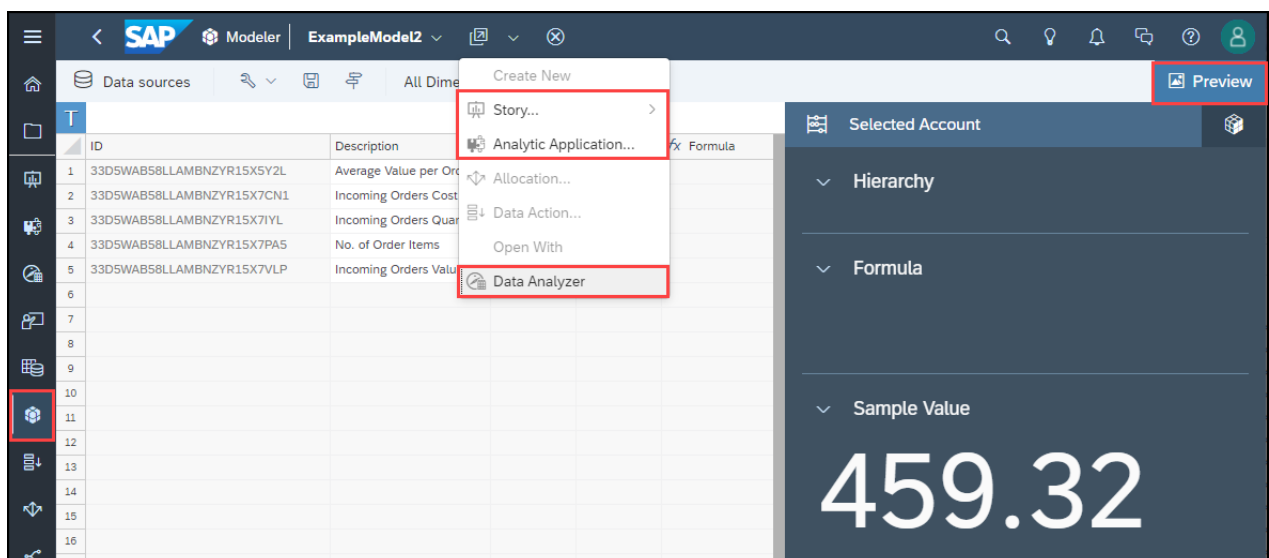
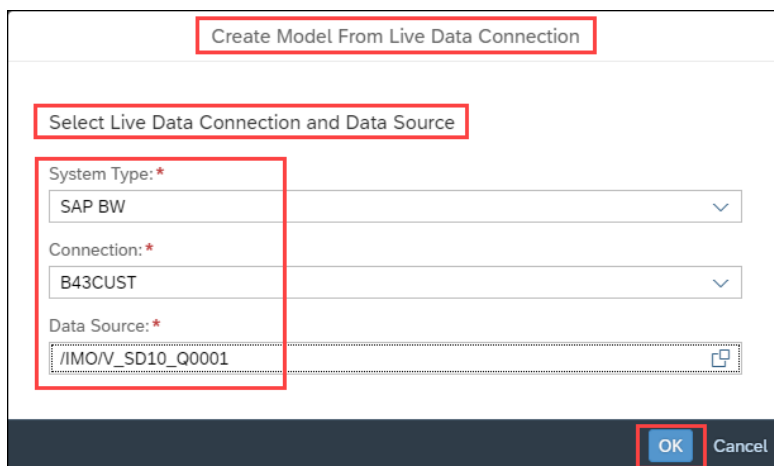
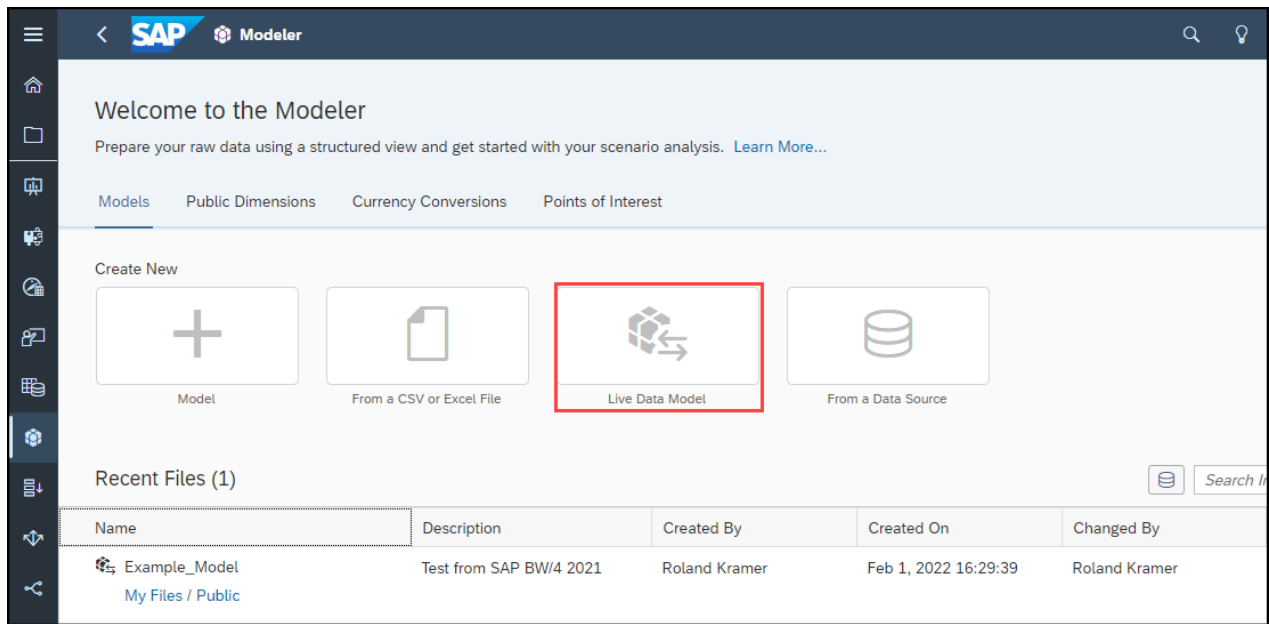
test your SAC Application now and log on to the SAP Analytics Cloud with your provided URL



Add a new connection by pressing the Plus Symbol 

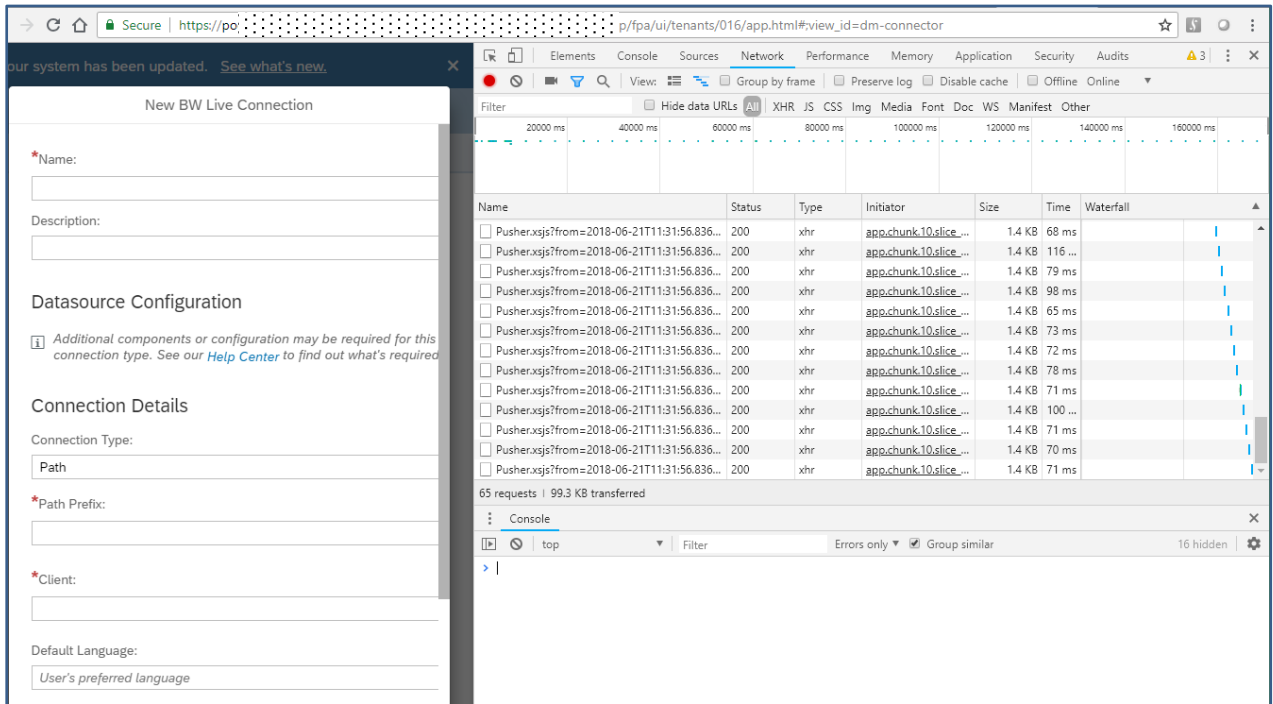


Add the System Details and Credentials to the screen as suggested and start with your Story.

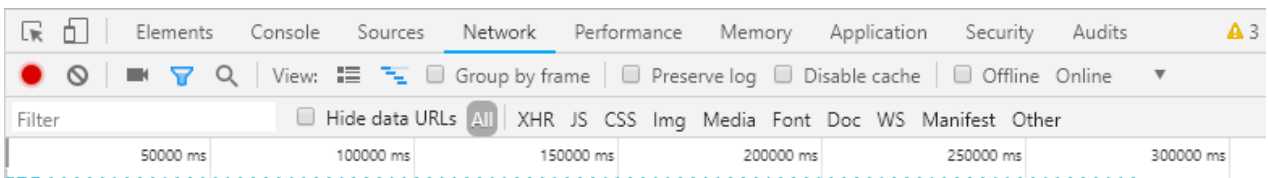




By pressing <F12> the Bowser (e.g. Chrome) open a Web Console to investigate any problems during the input or response of your SAP Analytics Cloud Connection



Important Information can be found at the Network TabStrip



If a Header is not jet maintained in tx. UCON_CHW you have to add them to the INA Service definition. Please Note that the Whitelist shows Green, even the missing Header is not jet maintained

Troubleshooting:

[Note 2544696 - Failed to connect to system in SAP Analytics Cloud *** Master KBA ***](#)

[Note 2589761 - Connecting to Live Data in SAP Analytics Cloud *** Master KBA ***](#)

[Note 2541557 - SAP Analytics Cloud with BW live connection - Which SP is recommended?](#)

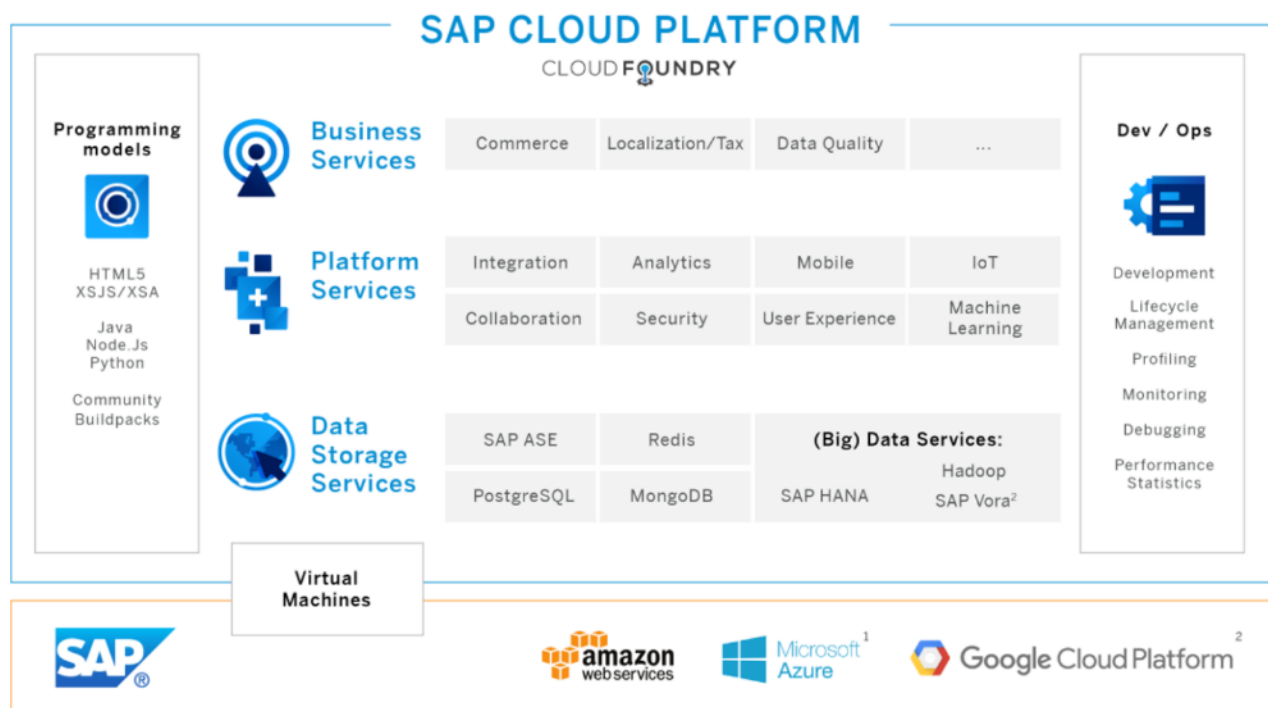
(this Note contains a XML file with SAP Notes which can be applied with Z_SAP_BW_NOTE_ANALYZER or with the new SNOTE Transaction)

6.7 SAP Cloud Platform Integration

Overview - <https://www.sap.com/products/cloud-platform.html>

SAP Cloud Platform is the agile platform-as-a-service (PaaS) for digital transformation, with comprehensive application development services and capabilities that allows businesses to collect, manage, analyze and leverage information of all types, to extend and connect to business systems, and to innovate new edge scenarios to allow the business to continuously adapt and advance. It enables customers to achieve business agility, create a truly integrated and optimized enterprise, and accelerate digital transformation across the business – all without the requirement of maintaining or investing in on-premises infrastructure.

CPI can be the central platform for the integration for all existing Cloud Solutions provided by SAP.



6.7.1 SAP Cloud Foundry

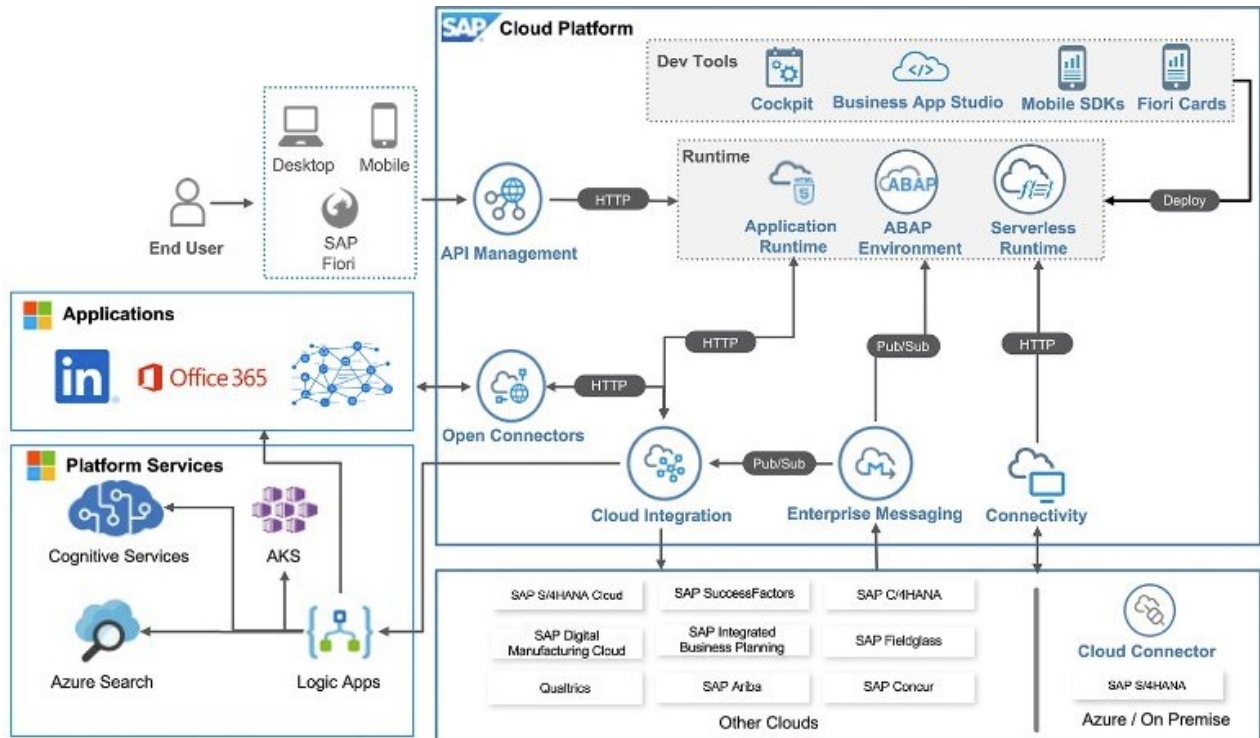
Overview - <https://www.sap.com/products/cloud-platform/capabilities/integration.html>

The screenshot displays the SAP Cloud Platform Cockpit interface. The left sidebar contains navigation options: Overview, Spaces, Subscriptions, Connectivity, Security (with sub-items: Administrators, Role Collections, Roles, Trust Configuration), Quota Plans, Entitlements, and Members. The main content area shows the 'Subaccount: trial - Overview' page. At the top, there is a 'Delete Subaccount' button. Below this, the 'Subaccount Details' section shows 'Subdomain: i0' and 'ID: 71'. To the right, the 'Cloud Foundry' section includes a 'Disable Cloud Foundry' button. A 'Spaces (1)' table is shown below, with one entry: 'dev' with '0' applications. At the bottom, the 'Subscriptions' section indicates 'Available: 17' and 'Active: 1'.

Two application subscription cards are shown. The first card is for 'SAP S/4HANA Cloud for Data En...' and is marked as 'Subscribed'. It features a cloud icon and the description: 'Provides Business Partner data from third-party data providers'. A 'Go to Application' link is at the bottom. The second card is for 'SAP Warehouse Insights trial' and is also marked as 'Subscribed'. It features a warehouse icon and the description: 'Optimize warehouse operations and increase resource utilizations.'. A 'Go to Application' link is at the bottom.

6.7.2 Extend SAP S/4HANA with SAP and Microsoft services

Overview - <https://www.sap.com/products/cloud-platform/use-cases/extend-s4hana.html>



See more SAP Cloud Platform use cases [here](#)

Integration with SAP Analytics Cloud.

For more information, see [Integration with SAP Analytics Cloud \(ISO\)](#)

Integration with SAP Business Warehouse

[SAP_COM_0042](#) – [Integration Technologies](#) - [SAP Cloud Platform Extension Factory](#) - [SAP Cloud API](#)

6.7.3 SAP Data Warehouse Cloud (DWC)

Overview: <https://www.sap.com/products/data-warehouse-cloud.html>

SAP Data Warehouse Cloud is the first enterprise-ready, data warehouse in the cloud that unites all your data sources in one solution, maintaining the security, trust, and semantic richness of your information.

Please Note that only SAP BW/4 2.0 can use the hybrid scenario. Component BW4-ME-DWC

[Note 2943200 - TCI for BW4HANA 2.0 Hybrid](#)

[Note 2945277 - BW/4 - Enable DWC "Import from Connection" for BW/4 Query - Revision 0](#)

[Note 2989654 - BW/4 - Enable DWC "Import from Connection" for BW/4 Query - Revision 1](#)

Further Components: DWC-DI-CON, HAN-DP-SDI

6.8 ODP based data extraction

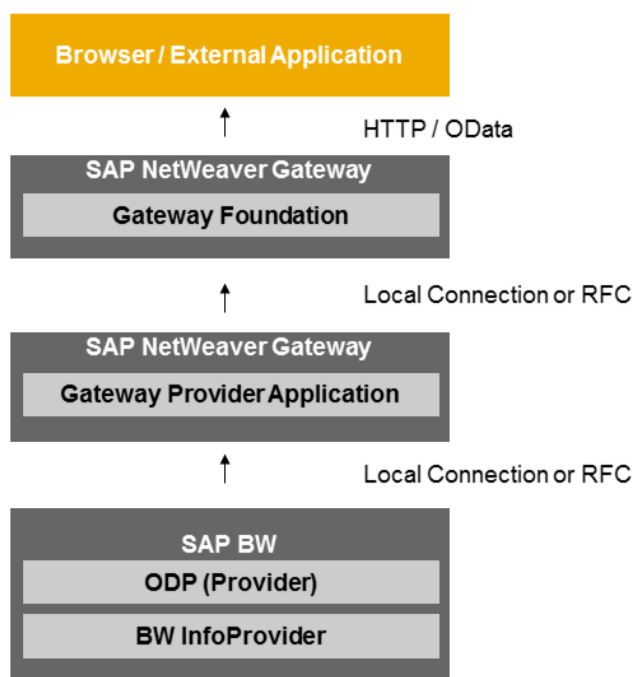
6.8.1 ODP-Based Data Extraction via OData

Using ODP-based data extraction via OData (based on the OData communication protocol) you can perform consistent, scalable delta extraction of ODP data into external non-ABAP recipients (such as Cloud and mobile applications).

SAP Help: [ODP-Based Data Extraction via OData](#)

Components for ODP-based extraction with OData

The following illustration shows the relationships between the involved components:

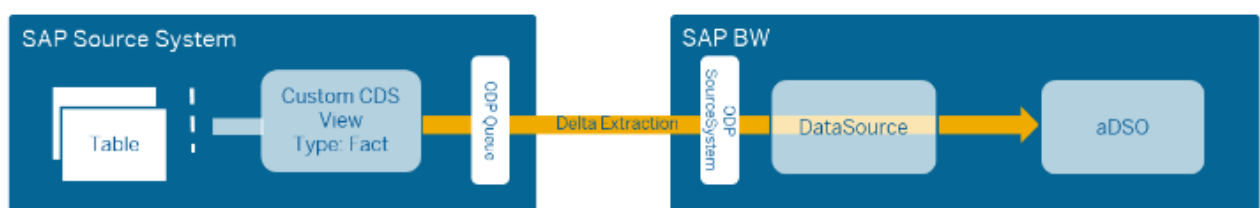


6.8.2 ODP-Based Data Extraction via CDS views

SAP Help: [Transferring Data from SAP Systems via ODP \(ABAP CDS Views\)](#)

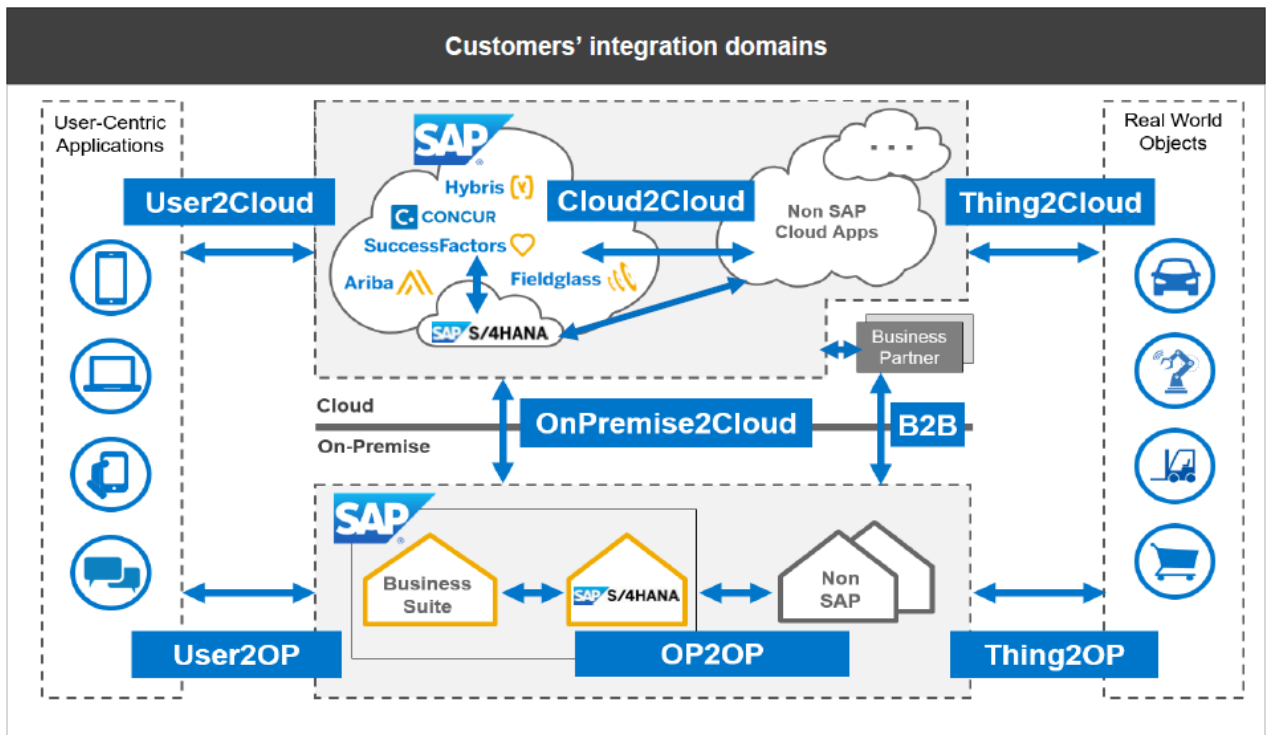
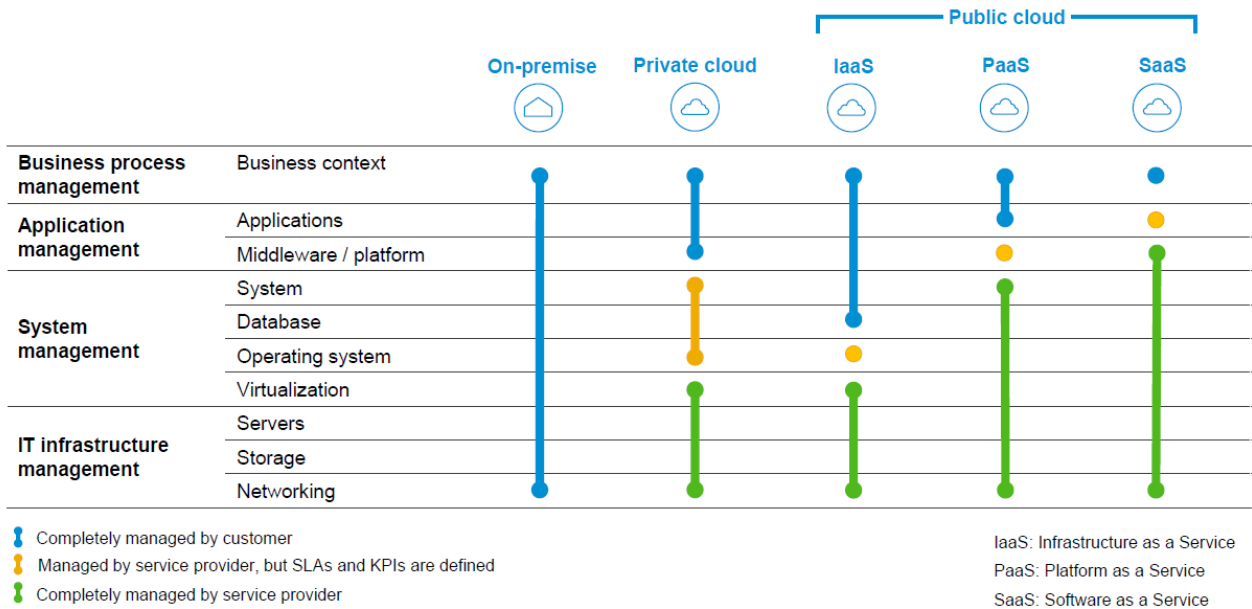
Related Information

[SAP How-to Guide - How to use ABAP CDS for Data Provisioning in BW](#)

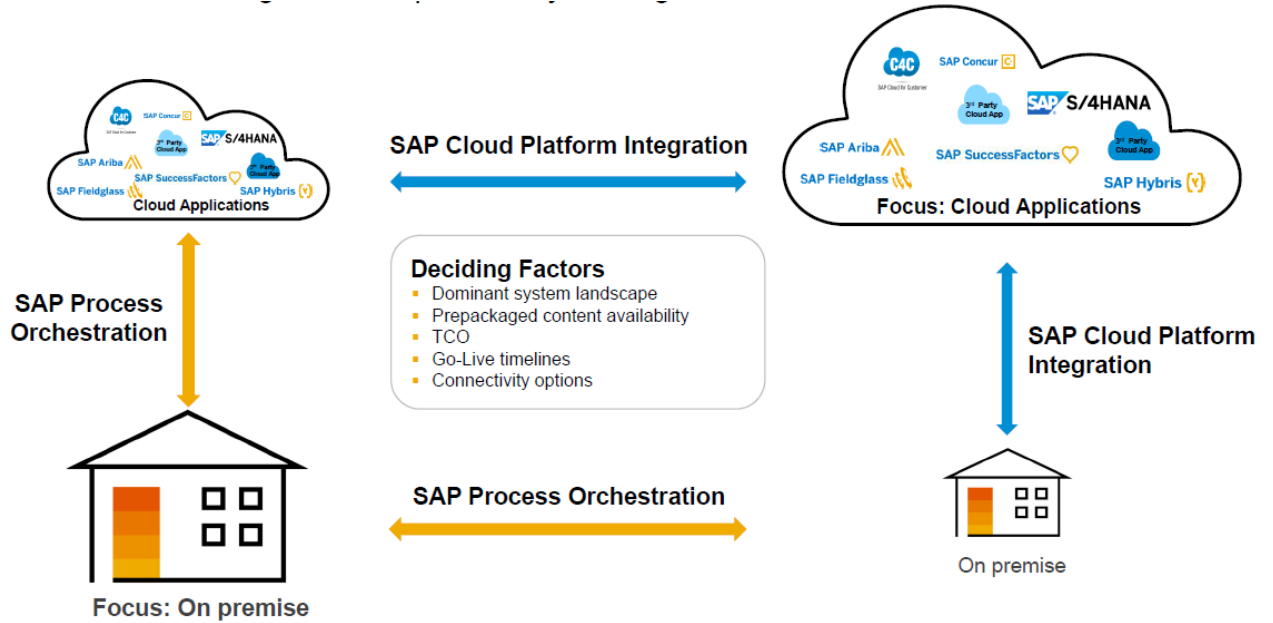


6.9 Integration with other Cloud Solutions

6.9.1 General cloud classification and responsibilities



6.9.2 SAP Integration Technologies

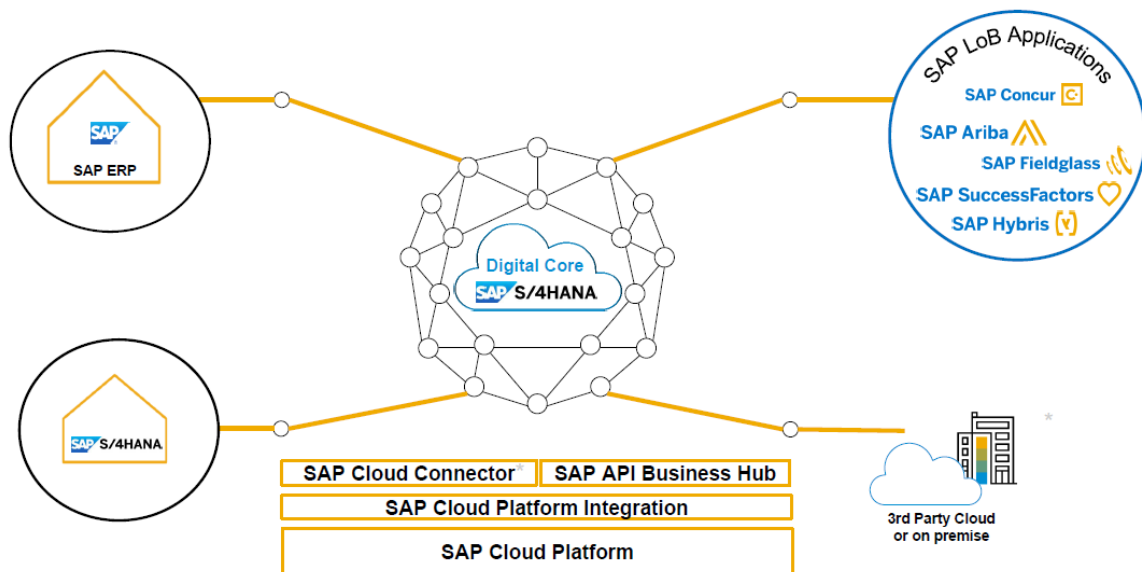


Cloud Infrastructure Services -

[SAP API Business Hub](#) – [SAP Fieldglass](#) – [SAP Cloud Platform \(SCP\)](#) -

- [Roadmap & Integration Guides -Customer](#)
- SAP Road Map for Cloud Integration - [Edition 2017 Q3](#)

Integration is the cornerstone for end-to-end digital transformation

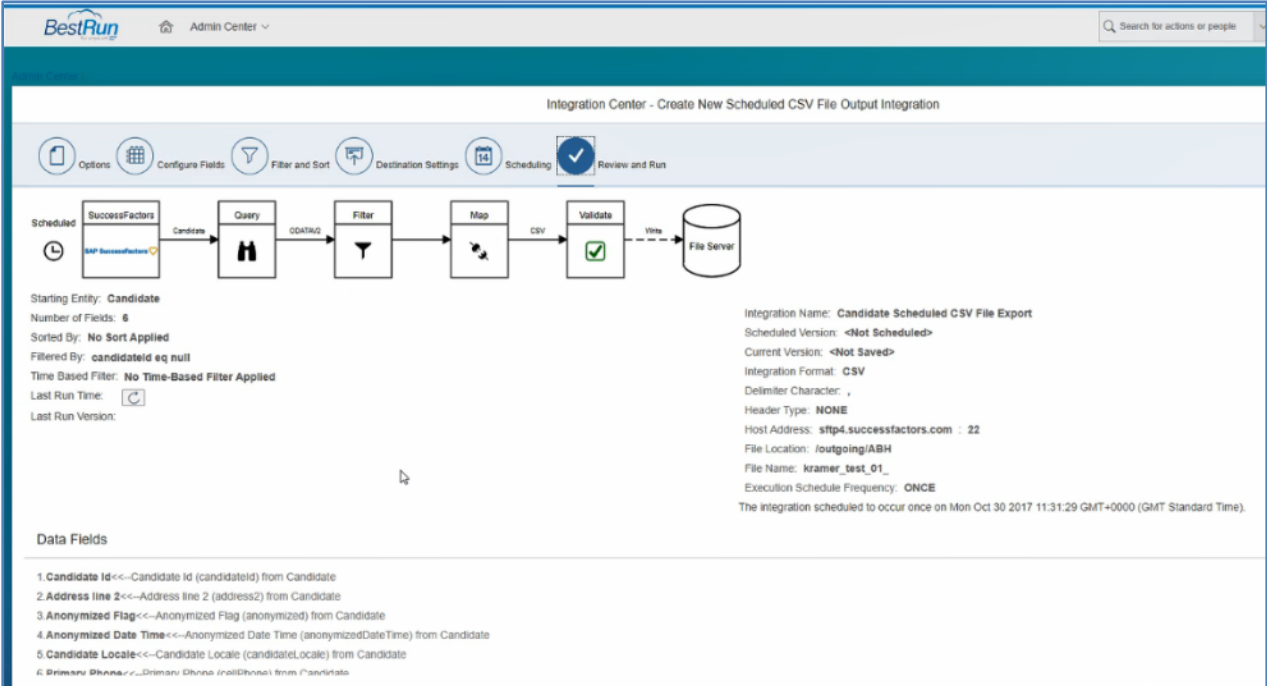


6.9.3 SuccessFactors

Integration via Integration Center (output via CSV files hosted on dedicated sFTP servers)

[SAP Success Factors Integration Center](#) - Q3 2017 – 2017-09-08

SAP Help: [Integration Center](#)



The screenshot shows the SAP Integration Center configuration interface for a new scheduled CSV file output integration. The process flow is: SuccessFactors (Candidate) → Query → OData → Filter → Map → CSV → Validate → Write → File Server.

Integration Details:

- Integration Name: Candidate Scheduled CSV File Export
- Scheduled Version: <Not Scheduled>
- Current Version: <Not Saved>
- Integration Format: CSV
- Delimiter Character: ,
- Header Type: NONE
- Host Address: sftp4.successfactors.com : 22
- File Location: /outgoing/ABH
- File Name: kramer_test_01_
- Execution Schedule Frequency: ONCE
- The integration scheduled to occur once on Mon Oct 30 2017 11:31:29 GMT+0000 (GMT Standard Time).

Data Fields:

- Candidate Id<<-Candidate Id (candidateId) from Candidate
- Address line 2<<-Address line 2 (address2) from Candidate
- Anonymized Flag<<-Anonymized Flag (anonymized) from Candidate
- Anonymized Date Time<<-Anonymized Date Time (anonymizedDateTime) from Candidate
- Candidate Locale<<-Candidate Locale (candidateLocale) from Candidate
- Primary Dharma<<-Dharma (dharma) from Candidate

SAP Help:

[Integrating SAP Cloud for Customer and SuccessFactors Employee Central Service Center - Employee Replication](#)

[Integrating SAP Hybris Cloud for Customer and SuccessFactors Employee Central Service Center - Employee Replication](#)

[Note 2171588 - SuccessFactors: OData API Metadata Refresh and Export](#)

[Note 2212494 - Enable Event Center/ Intelligent Services](#)

[Note 2215682 - SuccessFactors API URLs for different Data Centers](#)

[Note 2278751 - How to find the Admin Guides for SuccessFactors Integrations](#)

[Note 2355830 - How to refresh metadata of restricted OData MDF entities](#)

[Note 2395508 - IP addresses to be whitelisted when customer's own sftp is used with Int. Center](#)

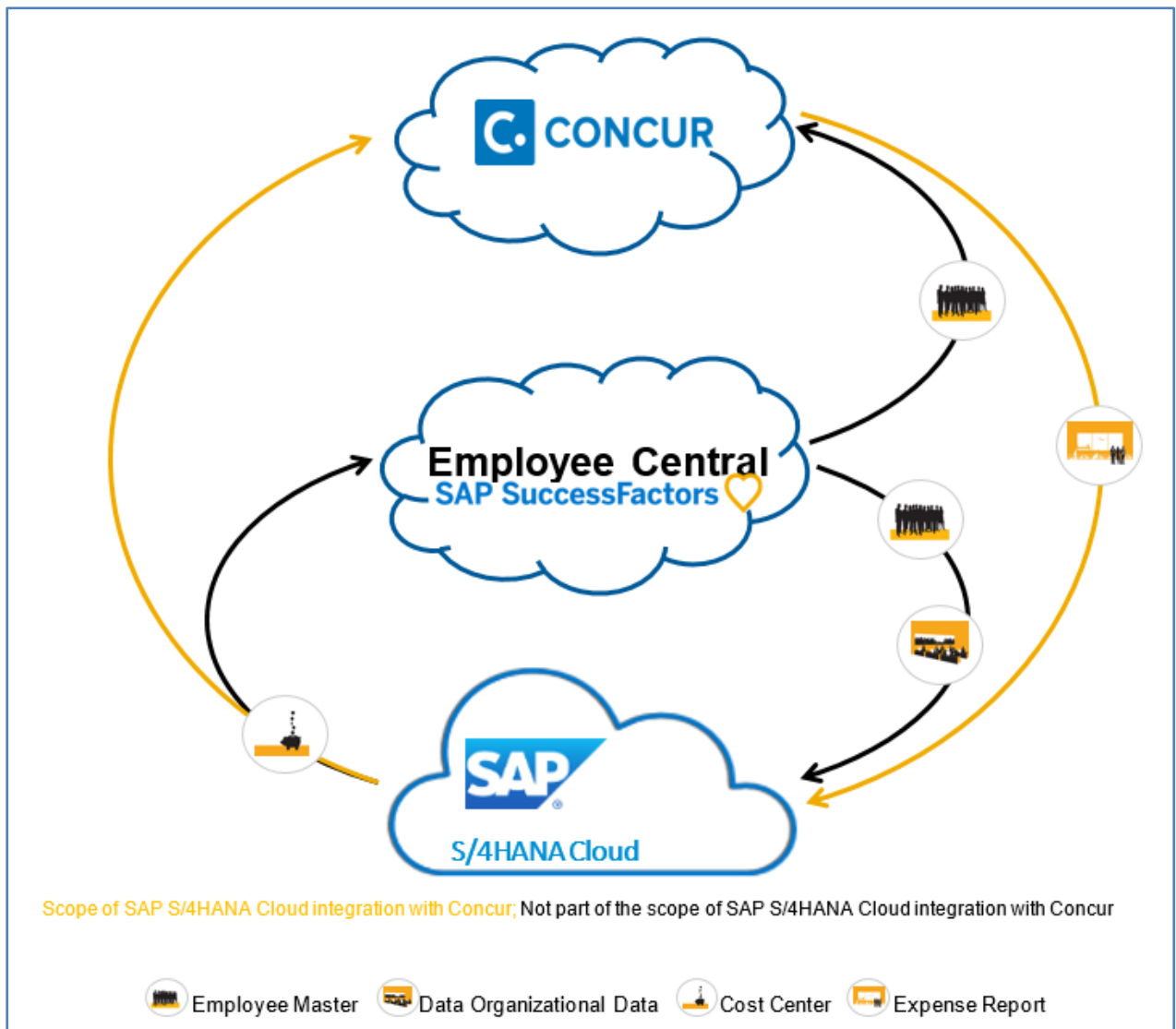
6.9.4 Concur

- [CONCUR – Development Center](#)
- [SAP-Concur Integration – SAP Setup Guide](#)

[Note 2432767 - SAP Best Practices for SAP S/4 HANA Cloud integration with Concur solutions](#)

[Note 2388587 - FAQ: Concur Integration](#)

Overall Scenario



6.9.5 Hybris

YaaS (SAP Hybris as a Service) is a microservices ecosystem helping businesses to rapidly augment and build new, highly flexible solutions. YaaS provides the platform that allows you to mashup, compose and measure all single components of your projects.



- [SAP Hybris Dev Portal](#)

[Note 2246019 - CPQ Hybris - Frequently Asked Questions](#)

SAP Hybris Service Engagement Center Integration

<https://help.sap.com/viewer/DRAFT/8541e089d13a4a27903b112b00ff2ced/6.6.0.0/en-US/c6c60f07e6504c989ecb6424cb786bc0.html>

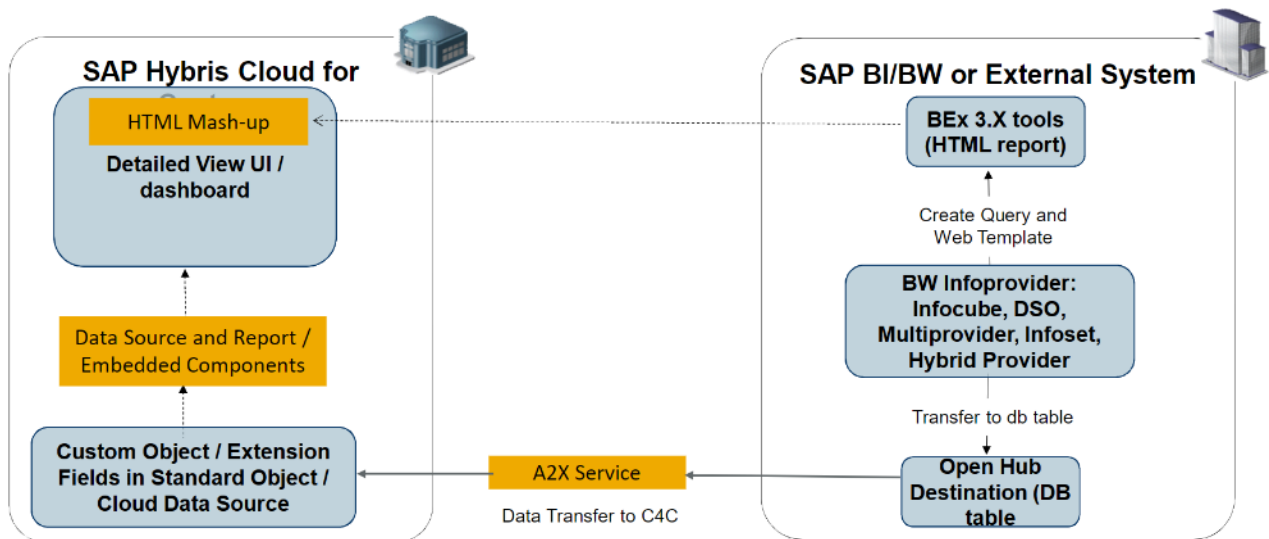
Blog: [SAP Cloud for Customer Integration with SAP On-Premise: ERP, CRM, BW](#)

Blog: [SAP Cloud for Customer integration with SAP Business Warehouse – Know your options](#)

The following options are available for C4C and SAP BW integration:

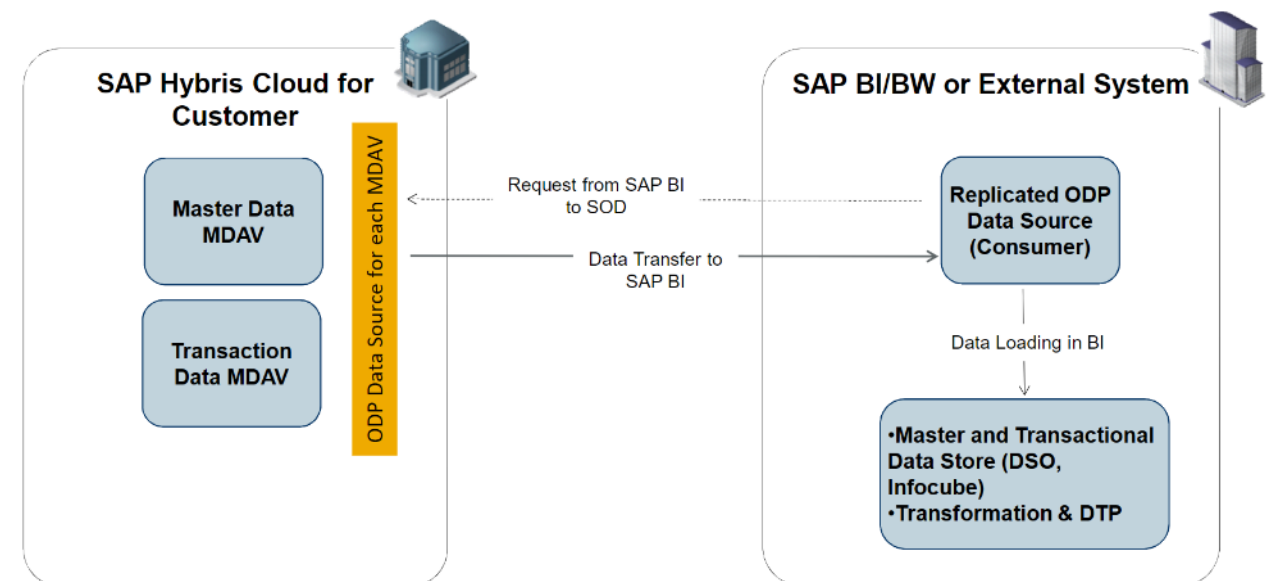
Outbound Integration (C4C to SAP BW)

- Transfer data from C4C to BW using the ODP connector
- Pull C4C report data via ODATA



Inbound Integration (SAP BW to C4C)

- Transfer data from BW to a C4C Cloud Data Source
- Use BW reports as mashups

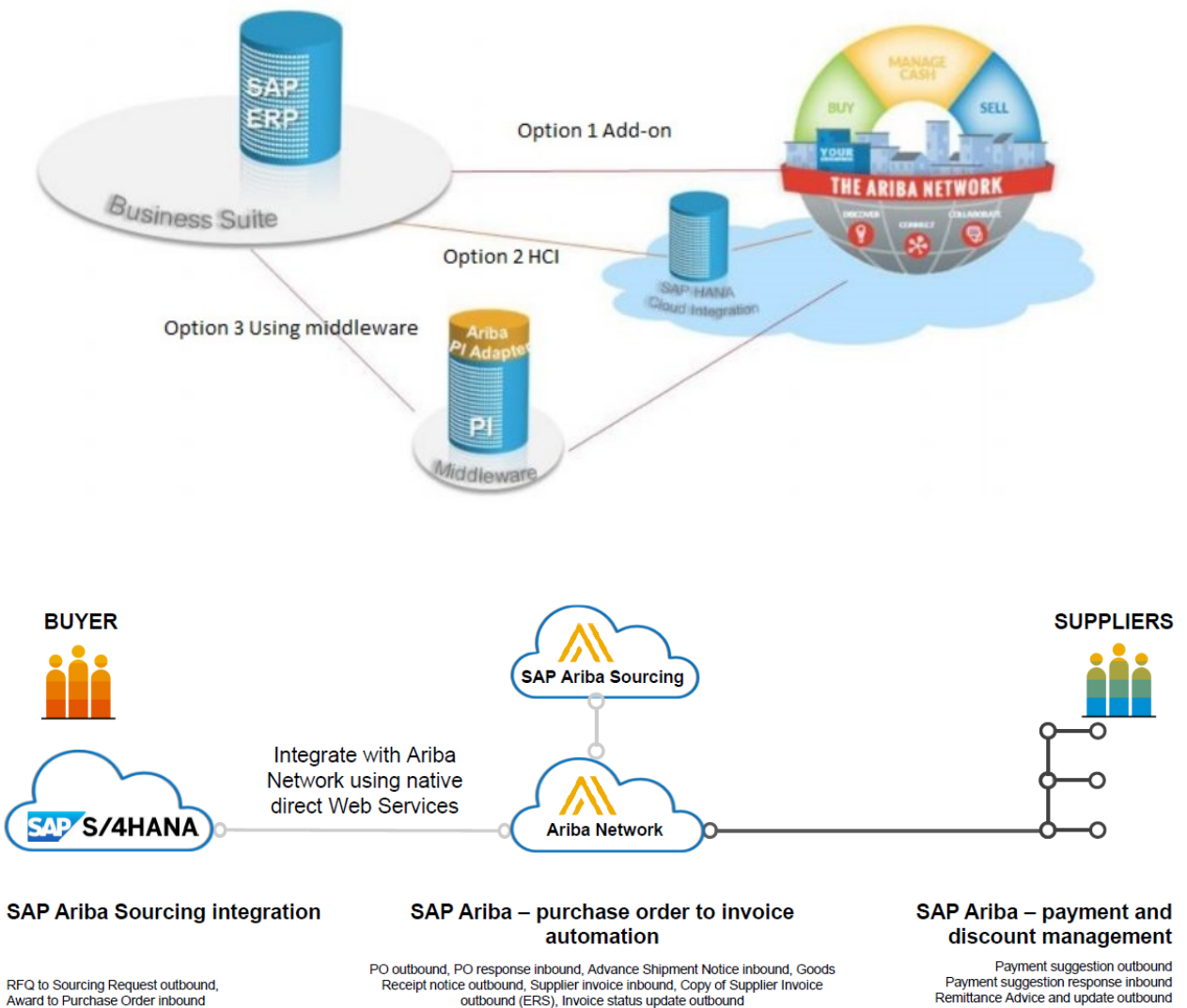


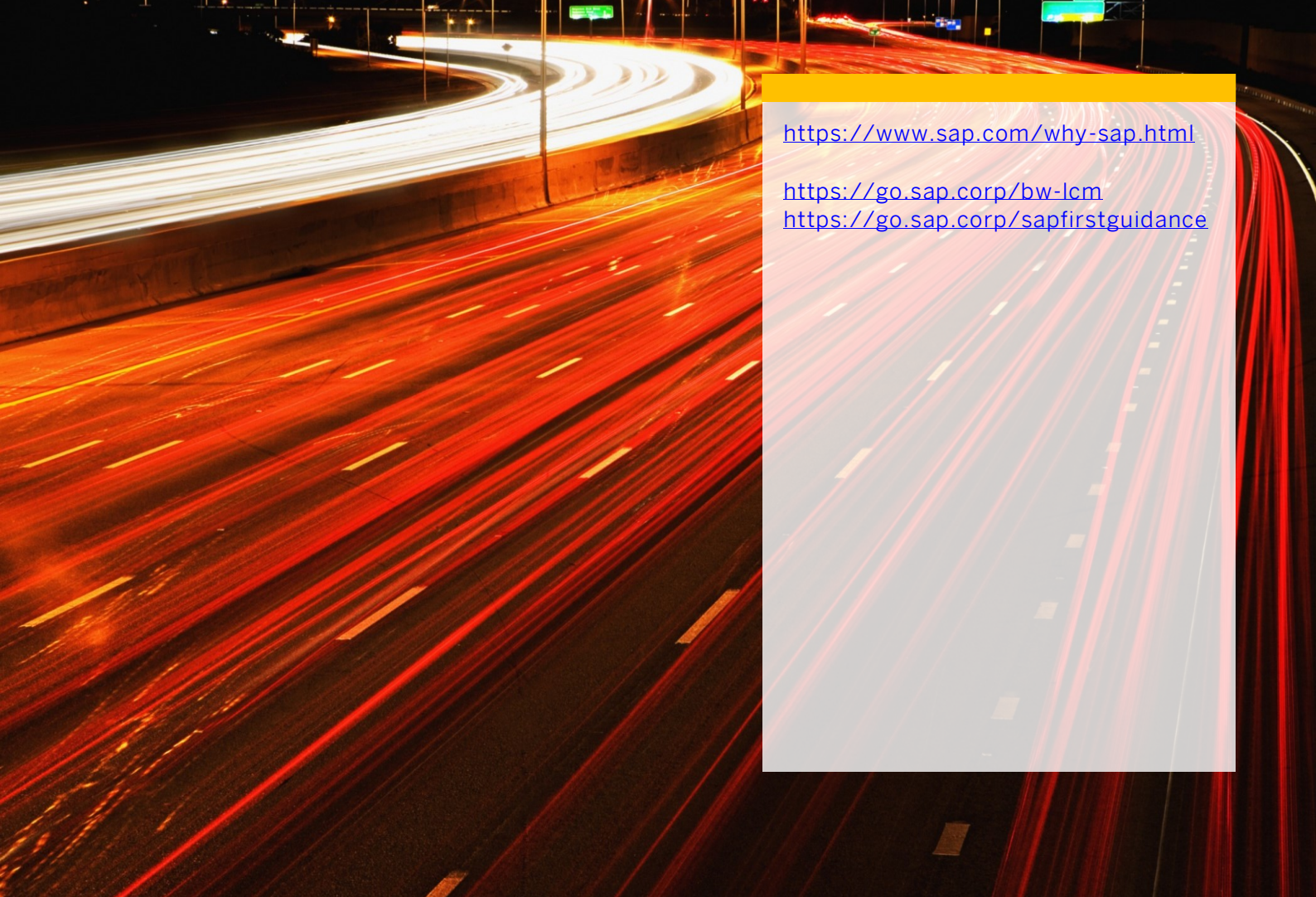
6.9.6 Ariba

- [SAP Ariba cloud solutions integration white paper](#)
- [SAP Ariba Open APIs](#)

Note 2336401 - SAP Best Practices for SAP S/4HANA Integration with SAP Ariba solutions V3

Blog - [HANA Cloud Integration \(HCI\), a new option to Integrate SAP to Ariba Network](#)





<https://www.sap.com/why-sap.html>

<https://go.sap.corp/bw-lcm>

<https://go.sap.corp/sapfirstguidance>

follow me



© 2020 SAP SE or an SAP affiliate company. All rights reserved.

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

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

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

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platforms, directions, and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.

See www.sap.com/copyright for additional trademark information and notices.