

ABAP SDK for Azure



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Agenda

- Setup SAP NetWeaver System
- Presentation & Overview
- Install and use ABAP SDK for Azure

History

Date	Comments	Author	Version
08.08.2018	Initial version	hobruche	0.1
07.09.2018	Feedback from PM & customer implemented	hobruche	0.5
11.09.2018	Switch to hobru-github (SUCU issue)	Hobruche	0.6
17.09.2018	Final changes for v1	Hobruche	1.0
20.09.2018	Feedback form first Hackathon, Bigger VMs	Hobruche	1.1
07.02.2019	Preparation for DSAG TT19	Hobruche	1.2

Introduction

The ABAP SDK for Azure is a result of several projects within Microsoft-IT. Out of several individual projects that all wanted to connect from our SAP Systems to Azure a centralized ABAP SDK for Azure was developed.

After using the SDK for several months internally Microsoft-IT decided to publish the code on GitHub. We then enhanced the installation process and are currently working with several SAP Mentors and SAP customer on new ideas.

The goal of the ABAP SDK for Azure is to simplify the consumption of service in Azure from ABAP as best as possible.

In our scenario we will use the Microsoft Azure Event Hub to push information from SAP to Azure. Once in Azure we will create a Logic App application that sends this information via Email to a user. Although this could obviously be done directly from ABAP, the goal here is to introduce different components and guide you through a full end-to-end process.

You will work with the Azure Portal (<http://portal.azure.com>) and the SAP Cloud Appliance Library (<http://cal.sap.com>).

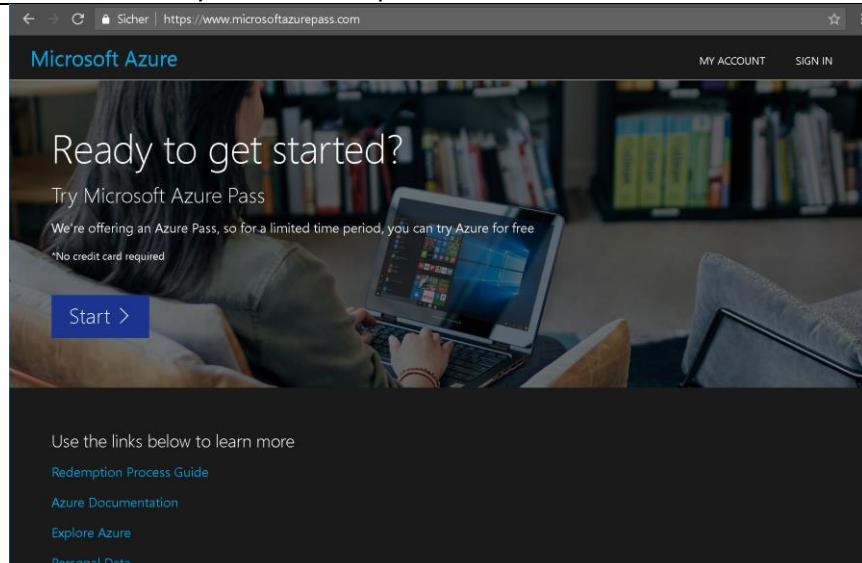
Most of the files are available via GitHub. The abapGit can be found at
<https://github.com/larshp/abapGit> the ABAP SDK for Azure can be found at
<https://github.com/Microsoft/ABAP-SDK-for-Azure>

All other required files can be found <https://aka.ms/sap/abapsdklinks>

Activate Azure Pass

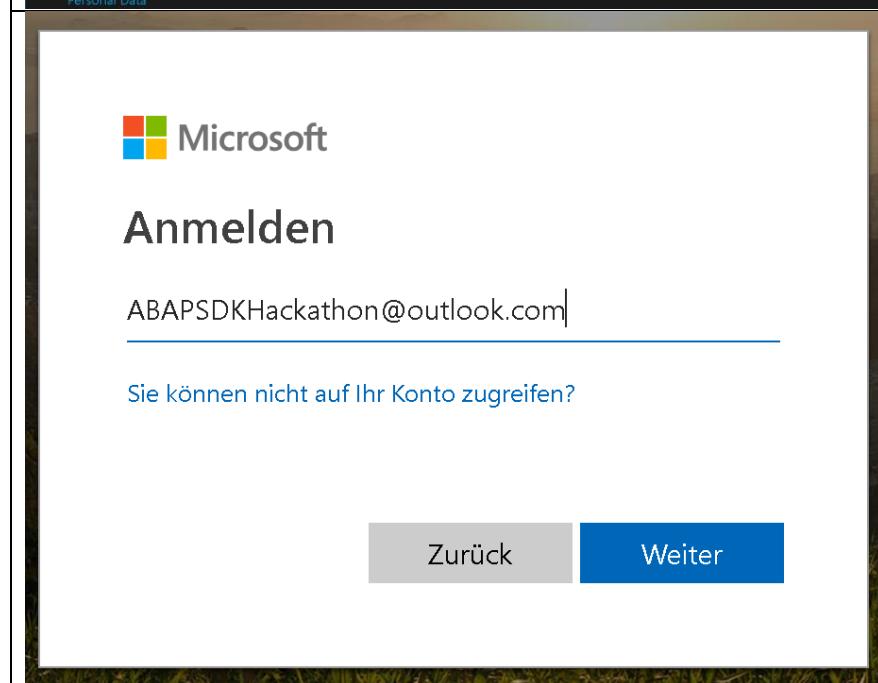
In this tutorial you are going to leverage an Microsoft Azure Pass. This pass allows you to use Azure for one month free of charge for up to \$100.

You can also run through this tutorial with your own existing Azure Subscription or get your own Free Trial Subscription using <http://azure.com/free> The main difference to using an Azure Pass is that you will have to enter a credit card information. Please keep in mind that this credit card will not be charged unless you explicitly change this setting. The credit card information is just used to make sure that you are a "real person".



The screenshot shows the Microsoft Azure Pass landing page. At the top, it says "Ready to get started? Try Microsoft Azure Pass". Below that, it states "We're offering an Azure Pass, so for a limited time period, you can try Azure for free" and "No credit card required". A large blue "Start >" button is visible. In the background, there's a photo of a person sitting on a couch using a laptop. At the bottom, there's a section titled "Use the links below to learn more" with links to "Redemption Process Guide", "Azure Documentation", "Explore Azure", and "Personal Data".

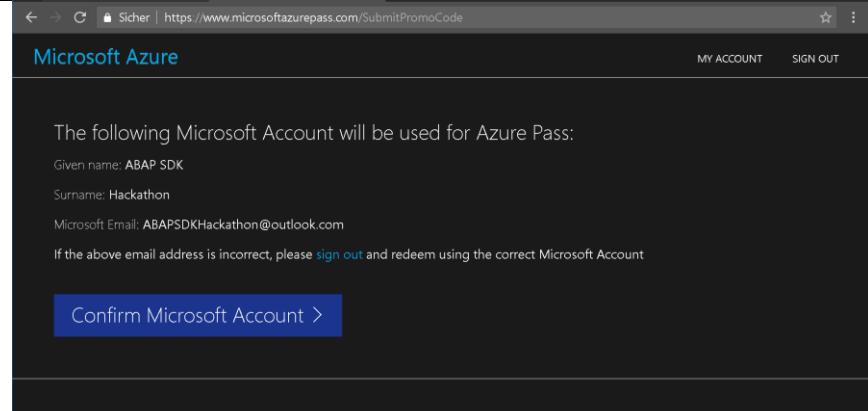
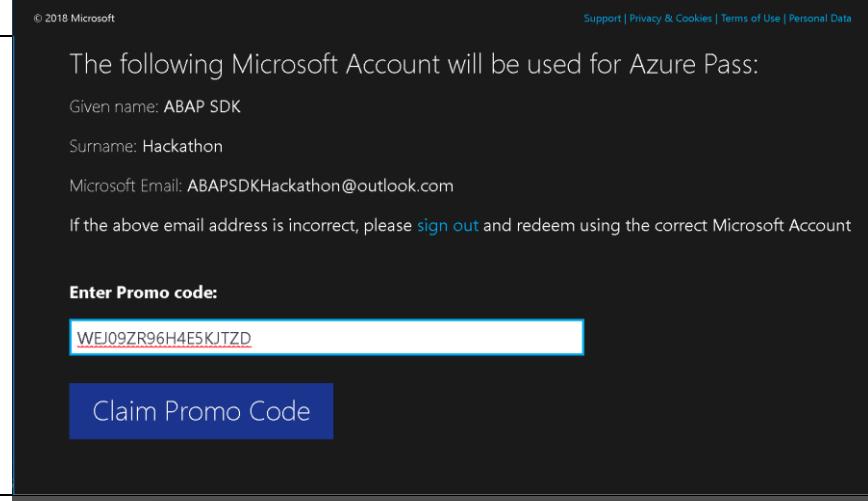
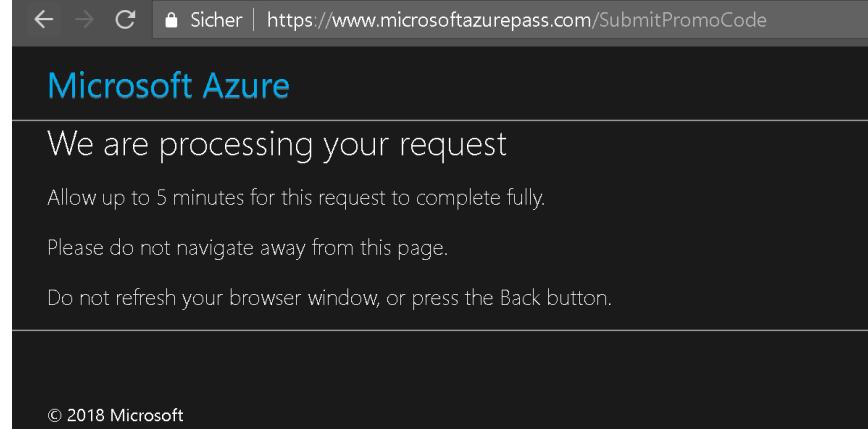
Go to
<http://www.microsoftAzurePass.com>

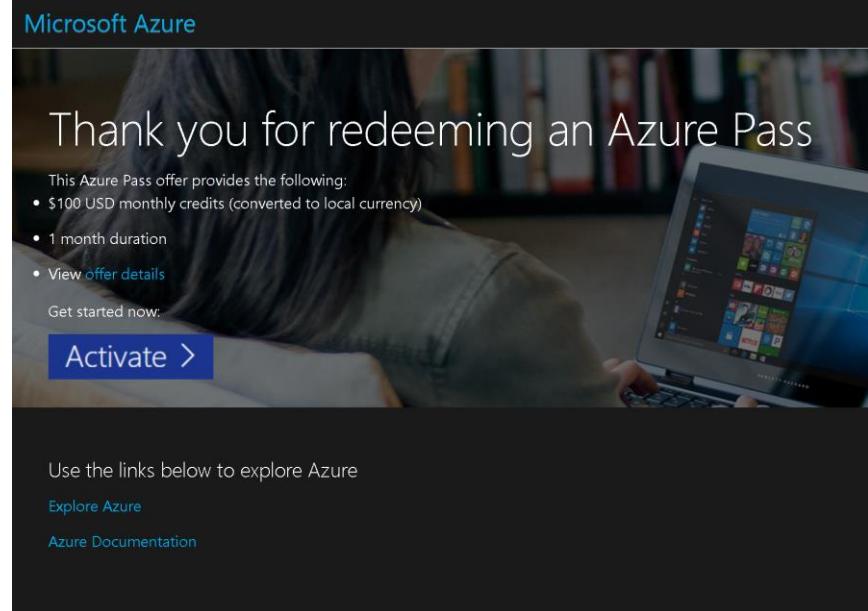
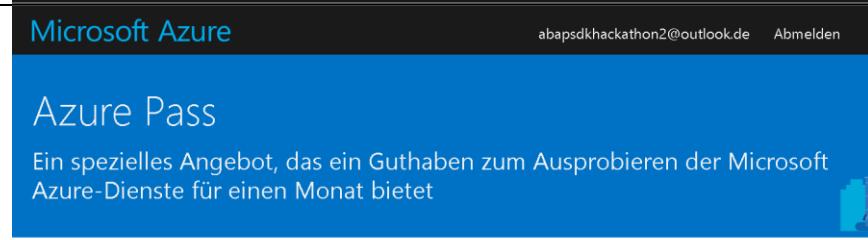


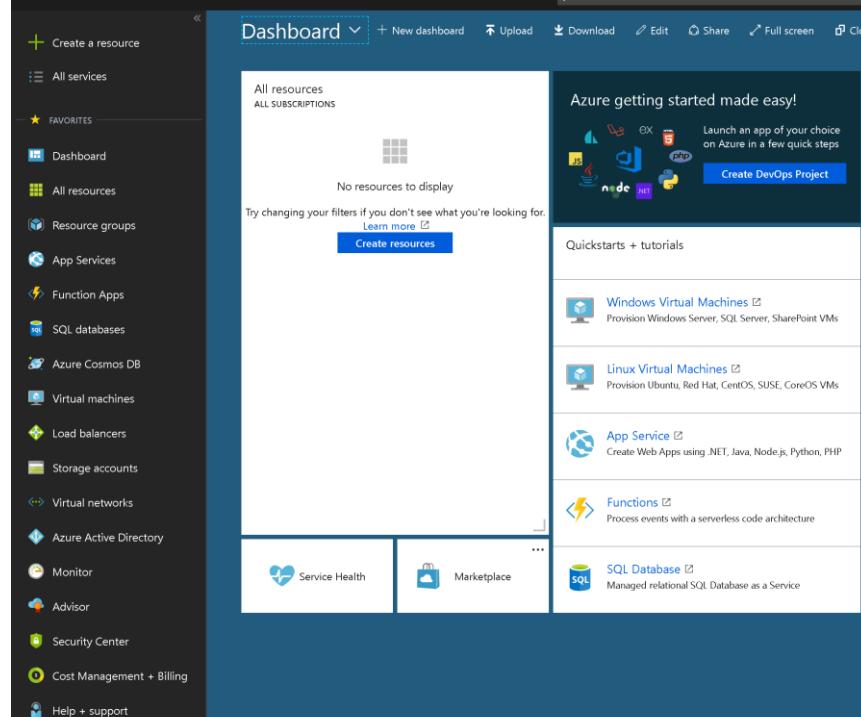
The screenshot shows the Microsoft login page. It features the Microsoft logo and the word "Anmelden" (Log in). Below the login field, which contains "ABAPSDKHackathon@outlook.com", is a link "Sie können nicht auf Ihr Konto zugreifen?". At the bottom, there are two buttons: "Zurück" (Back) and "Weiter" (Next).

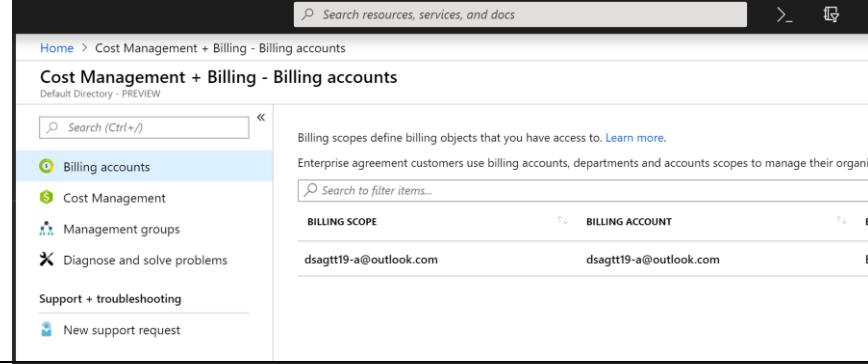
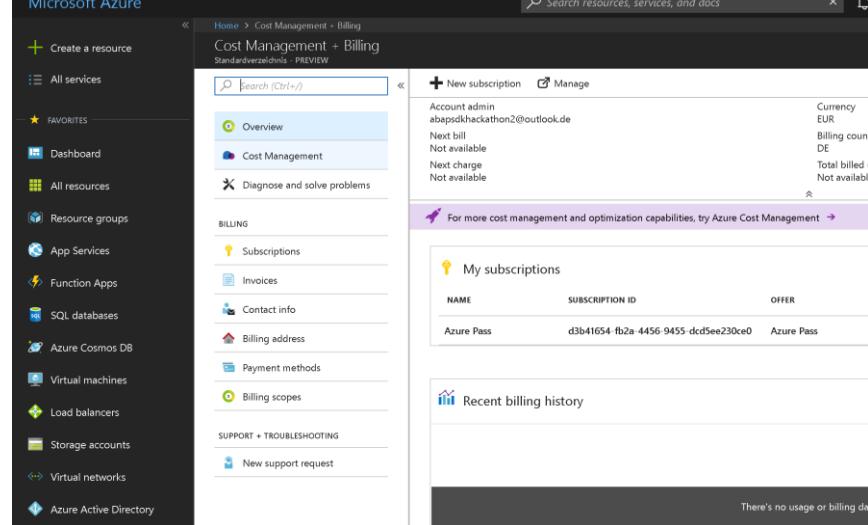
Click on **Start**
And log-in with your
Microsoft user

Note: Create a new
Outlook user if required

 <p>The following Microsoft Account will be used for Azure Pass:</p> <p>Given name: ABAP SDK Surname: Hackathon Microsoft Email: ABAPSDKHackathon@outlook.com</p> <p>If the above email address is incorrect, please sign out and redeem using the correct Microsoft Account</p> <p>Confirm Microsoft Account ></p>	Click on Confirm Microsoft Account
 <p>The following Microsoft Account will be used for Azure Pass:</p> <p>Given name: ABAP SDK Surname: Hackathon Microsoft Email: ABAPSDKHackathon@outlook.com</p> <p>If the above email address is incorrect, please sign out and redeem using the correct Microsoft Account</p> <p>Enter Promo code:</p> <input type="text" value="WEJ09ZR96H4E5KJTZD"/> <p>Claim Promo Code</p>	Enter Promo Code and click on Claim Promo Code
 <p>We are processing your request</p> <p>Allow up to 5 minutes for this request to complete fully.</p> <p>Please do not navigate away from this page.</p> <p>Do not refresh your browser window, or press the Back button.</p>	Wait for the Verification Step

 <p>Microsoft Azure</p> <h1>Thank you for redeeming an Azure Pass</h1> <p>This Azure Pass offer provides the following:</p> <ul style="list-style-type: none"> • \$100 USD monthly credits (converted to local currency) • 1 month duration • View offer details <p>Get started now:</p> <p>Activate ></p> <p>Use the links below to explore Azure</p> <p>Explore Azure</p> <p>Azure Documentation</p>	Click on Activate
 <p>Microsoft Azure</p> <p>abapsdkhackathon2@outlook.de Abmelden</p> <h2>Azure Pass</h2> <p>Ein spezielles Angebot, das ein Guthaben zum Ausprobieren der Microsoft Azure-Dienste für einen Monat bietet</p> <p>Persönliche Informationen</p> <hr/> <p>Land/Region <small>i</small></p> <p>Deutschland</p> <p>Vorname</p> <p>ABAP SDK</p> <p>Nachname</p> <p>Hackathon</p> <p>E-Mail-Adresse für wichtige Benachrichtigungen <small>i</small></p> <p>Abapsdkhackathon2@outlook.de</p> <p>Telefon</p> <p>(0 15) 1 44 01 2029</p> <p>USt-IdNr. des Unternehmens <small>i</small></p> <p>Optional</p> <p>Durch Fortfahren bestätigen Sie die Datenschutzerklärung und den Abonnementvertrag.</p> <p>Weiter</p>	Enter required contact information and click on Next

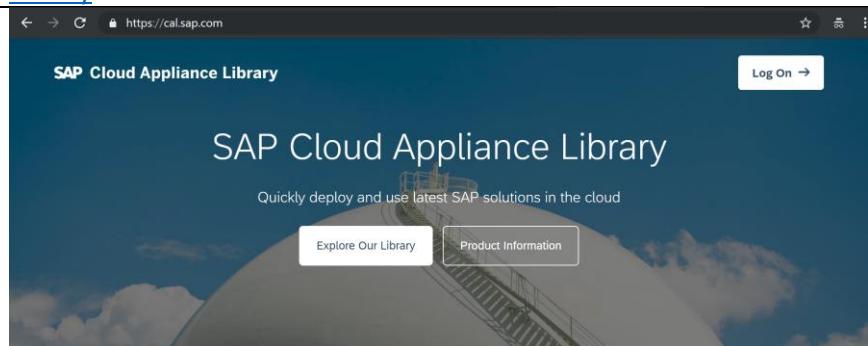
<p>1 Persönliche Informationen</p> <p>2 Vereinbarung</p> <p><input checked="" type="checkbox"/> Ich stimme dem Abonnementvertrag, den Angebotsdetails und der Datenschutzerklärung zu.</p> <p><input type="checkbox"/> Ich möchte Informationen, Tipps und Angebote zu Azure von Microsoft oder ausgewählten Partnern erhalten, z. B. den Azure-Newsletter, Preisaktualisierungen und Informationen zu anderen Microsoft-Produkten und -Diensten.</p> <p>Registrieren</p>	<p>Accept the Terms & Conditions and click on Register</p>
	<p>You are now redirected to the Azure Portal. This is the central place to work with your Azure Subscription.</p> <p>For now, skip the Tour and click on "Maybe Later"</p>
	<p>For the next step with the SAP Cloud Appliance Library, you need the ID of your Subscription ID. Click on Kostenverwaltung / Cost Management + Billing</p>

 <p>Billing Scope</p> <table border="1"> <thead> <tr> <th>BILLING SCOPE</th> <th>BILLING ACCOUNT</th> </tr> </thead> <tbody> <tr> <td>dsagtt19-a@outlook.com</td> <td>dsagtt19-a@outlook.com</td> </tr> </tbody> </table>	BILLING SCOPE	BILLING ACCOUNT	dsagtt19-a@outlook.com	dsagtt19-a@outlook.com	<p>Click on your user under Billing Scope (e.g. dsagtt19-a@outlook.com)</p>		
BILLING SCOPE	BILLING ACCOUNT						
dsagtt19-a@outlook.com	dsagtt19-a@outlook.com						
 <p>My subscriptions</p> <table border="1"> <thead> <tr> <th>NAME</th> <th>SUBSCRIPTION ID</th> <th>OFFER</th> </tr> </thead> <tbody> <tr> <td>Azure Pass</td> <td>d3b41654-fb2a-4456-9455-dcd5ee230ce0</td> <td>Azure Pass</td> </tr> </tbody> </table> <p>Recent billing history</p> <p>There's no usage or billing data</p>	NAME	SUBSCRIPTION ID	OFFER	Azure Pass	d3b41654-fb2a-4456-9455-dcd5ee230ce0	Azure Pass	<p>Note down the Subscription ID, e.g. d3b41654-fb2a-4456-9455-dcd5ee230ce0</p> <p>Note: You will need this ID in the next step.</p>
NAME	SUBSCRIPTION ID	OFFER					
Azure Pass	d3b41654-fb2a-4456-9455-dcd5ee230ce0	Azure Pass					

Deploy SAP NetWeaver System via SAP Cloud Appliance Library

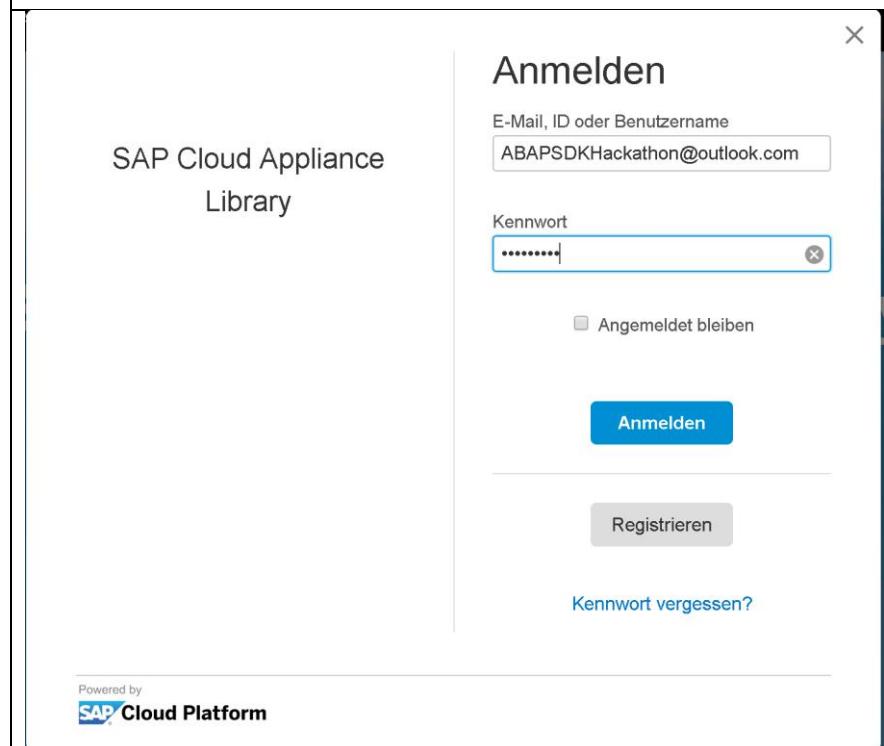
The SAP Cloud Appliance Library offers over 100 preconfigured solutions from SAP. You can pick from a list of these solutions and create your very own instance. A lot of the solutions offered are free of charge, others can be run for 30 days in a trial, a few need to be activated by SAP first.

If you want to use the SAP Cloud Appliance library for any of the non-free solutions you can get a subscription from SAP via <https://www.sapstore.com/solutions/99007/SAP-Cloud-Appliance-Library>



Go to <http://cal.sap.com> and click on Log On

What is SAP Cloud Appliance Library?



Anmelden

E-Mail, ID oder Benutzername
ABAPSDKHackathon@outlook.com

Kennwort
.....

Angemeldet bleiben

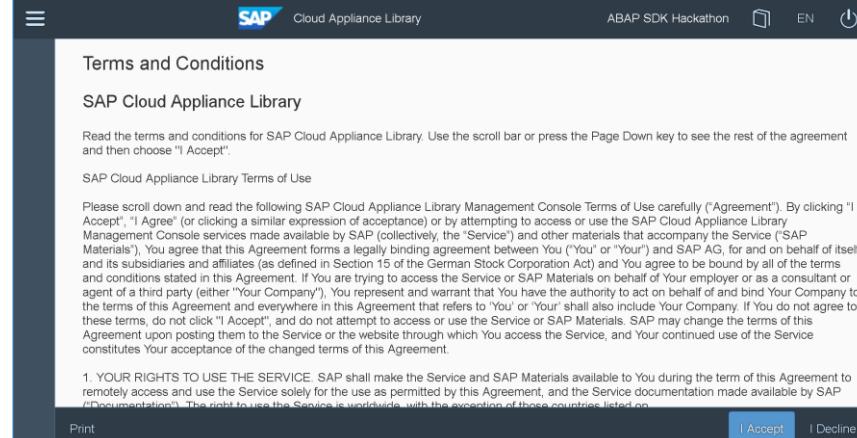
Anmelden

Registrieren

Kennwort vergessen?

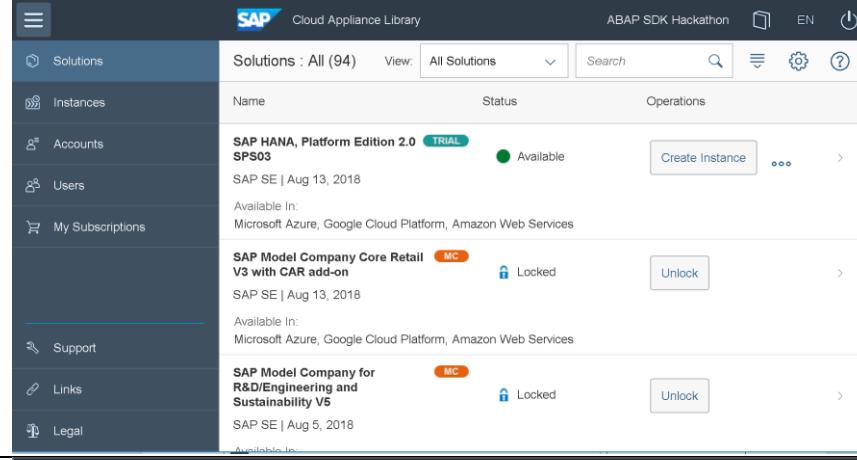
Powered by
SAP Cloud Platform

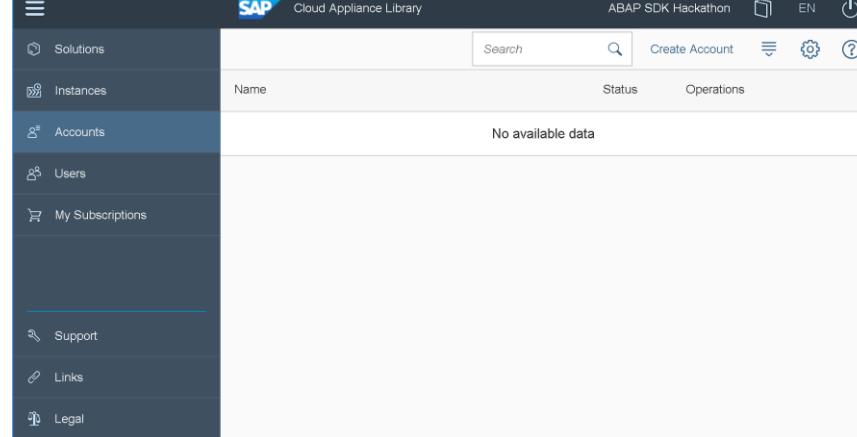
Logon / Register and Confirm with your Email or P-or S-User



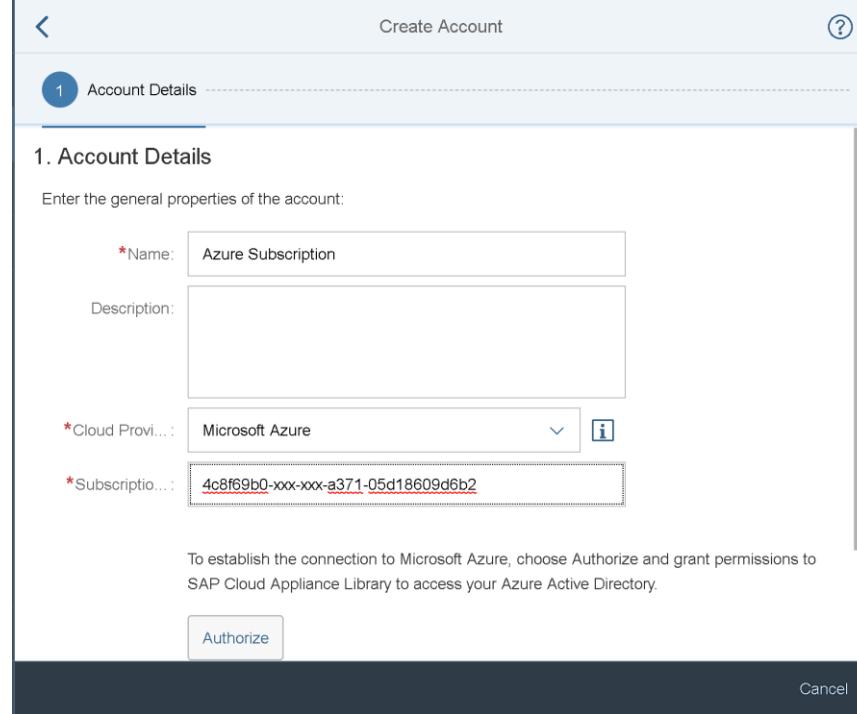
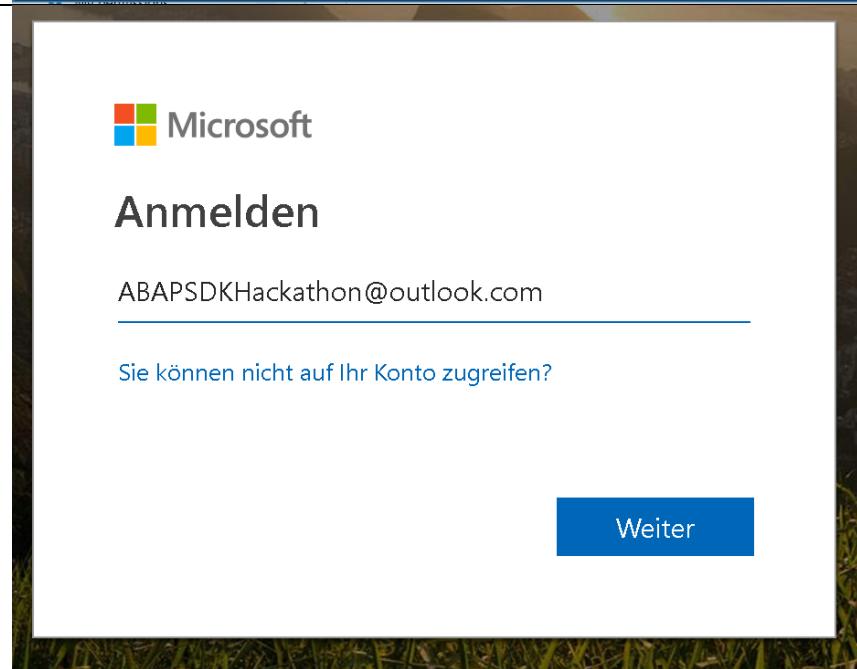
Accept Terms & Conditions

Click on Accounts





Select Create Account

 <p>1. Account Details</p> <p>Enter the general properties of the account:</p> <p>*Name: Azure Subscription</p> <p>Description:</p> <p>*Cloud Prov...: Microsoft Azure</p> <p>*Subscriptio...: 4c8f69b0-xxx-xxx-a371-05d18609d6b2</p> <p>To establish the connection to Microsoft Azure, choose Authorize and grant permissions to SAP Cloud Appliance Library to access your Azure Active Directory.</p> <p>Authorize</p> <p>Cancel</p>	<p>Enter the following Details:</p> <p>Name: Azure Subscription</p> <p>Cloud Provider: Microsoft Azure</p> <p>Subscription ID: <enter the ID from the previous step></p> <p>Click on Authorize</p>
 <p>Microsoft</p> <h1>Anmelden</h1> <p>ABAPSDKHackathon@outlook.com</p> <p>Sie können nicht auf Ihr Konto zugreifen?</p> <p>Weiter</p>	<p>You are redirected to login.microsoftonline.com</p> <p>Enter your Microsoft-ID and password from the first Chapter.</p>

 Microsoft
 dsagtt19-a@outlook.com

Permissions requested

 SAP Cloud Appliance Library
[App info](#)

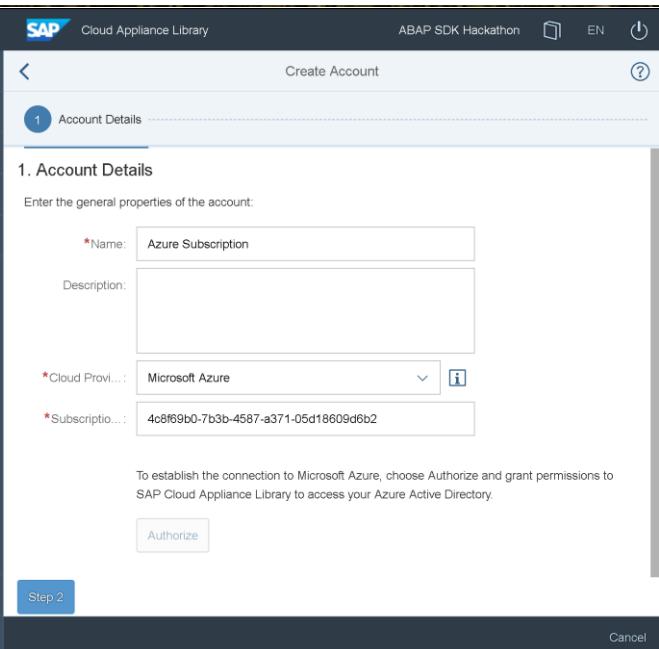
This app would like to:

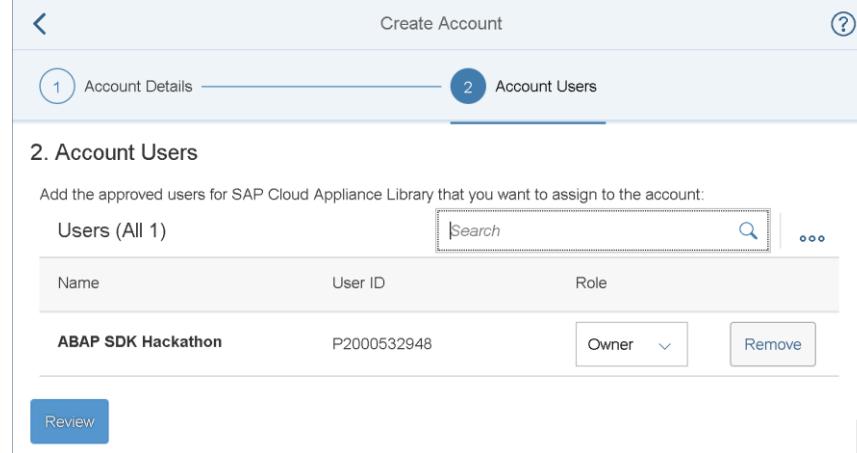
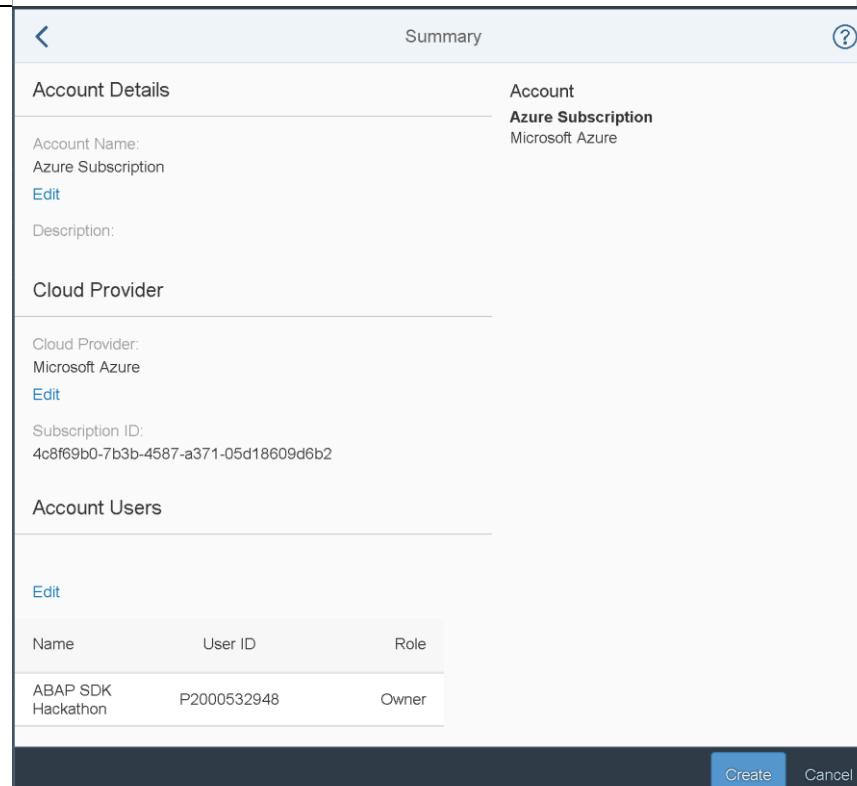
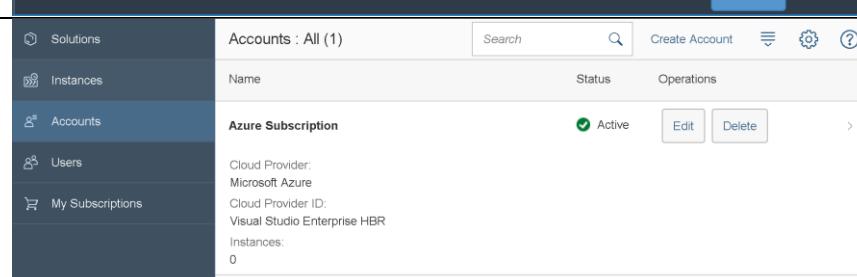
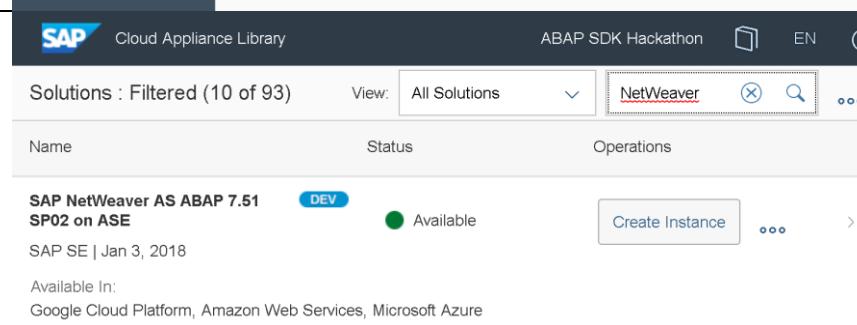
- ✓ Sign you in and read your profile
- ✓ Access Azure Service Management as you (preview)
- Consent on behalf of your organization

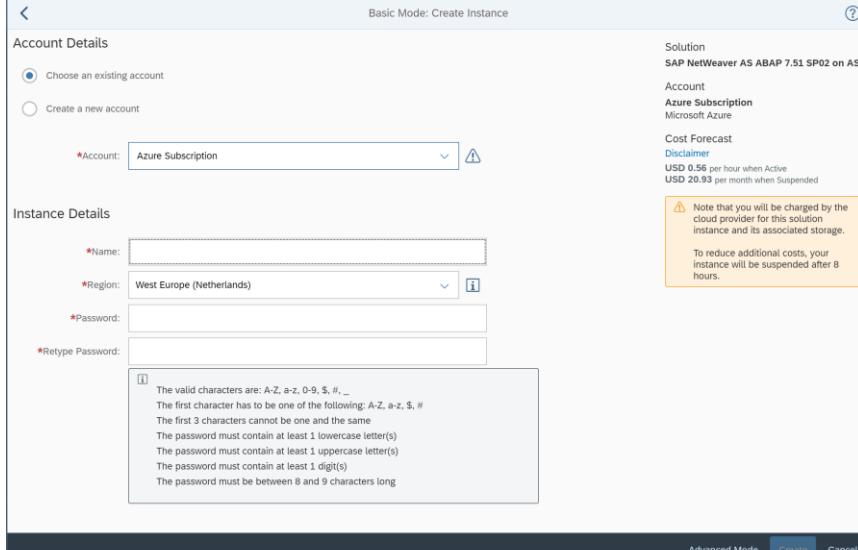
Accepting these permissions means that you allow this app to use your data as specified in their terms of service and privacy statement. **The publisher has not provided links to their terms for you to review.** You can change these permissions at <https://myapps.microsoft.com>. [Show details](#)

[Cancel](#) [Accept](#)

Back in SAP Cloud Appliance Library, click on **Step 2**



	<p>Validate the Settings and click on Review</p>
	<p>In the Summary screen click on Create</p>
	<p>Now click on Solutions</p>
	<p>Search for NetWeaver, search for SAP NetWeaver AS ABAP 7.51 SP02 on ASE and click on Create Instance</p> <p>Note: This tutorial is based on 7.51 SP02 ASE. Please make sure to</p>

	select this system and not 7.52!
<p>Terms and Conditions</p> <p>SAP NetWeaver AS ABAP 7.51 SP02 on ASE</p> <p>Read the terms and conditions of the solution. Use the scroll bar or press the Page Down key to see the rest of the agreement and then choose "I Accept".</p> <p>SAP DEVELOPER CENTER MASTER SOFTWARE DEVELOPER LICENSE AGREEMENT</p> <p>Please scroll down and read the following SAP Developer Center Software Developer License Agreement ("Developer Agreement") carefully. By clicking "I Accept" or by attempting to access or use the SAP Software, You agree that this Developer Agreement forms a legally binding agreement between You ("You" or "Your") and SAP SE, for and on behalf of itself and its subsidiaries and affiliates (as defined in Section 15 of the German Stock Corporation Act) ("SAP") and You agree to be bound by all of the terms and conditions stated in this Developer Agreement. If You are trying to access or download the SAP Software on behalf of Your employer or as a consultant or agent of a third party (either "Your Company"), You represent and warrant that You have the authority to act on behalf of and bind Your Company to the terms of this Developer Agreement and everywhere in this Developer Agreement that refers to 'You' or 'Your' shall also include Your Company. If You do not agree to these terms, do not click "I Accept", and do not access or use the SAP Software.</p> <p>Please note additional or different product specific use rights and restrictions applicable to the SAP Software licensed hereunder are set forth in Exhibit B, which is attached. Exhibit B is incorporated into the Developer Agreement by this reference, and You should review Exhibit B for terms and conditions that apply to the use of the SAP Software You are licensing. In the event of a conflict between any of the terms and conditions in this Developer Agreement and in Exhibit B, the terms of Exhibit B shall control.</p> <p>1. DEFINITIONS: "Content" shall mean code, models, applications, configurations, data, or other electronic materials created by You using the Tools and/or any SAP Software licensed hereunder.</p> <p>"Excluded License" shall mean an open source or other software license that requires, as a condition of license, use, modification, distribution or conveyance, that (a) the code be disclosed or distributed in source code form; (b) others have the right to modify or create derivative works of it; and/or (c) it becomes redistributable at no charge.</p>	Accept Terms & Conditions by clicking on I Accept
	
<p>Click on Advanced Mode</p> 	Click on Step 2

1 Account Details 2 Instance Details 3 Virtual Machines

2. Instance Details

Enter the general properties of the solution instance:

*Name:	SAP NetWeaver 7.51
Description:	
*Region:	West Europe (Netherlands)
*Network:	SAP CAL Default Network
*Subnet:	default 10.0.0.0/24
<input type="checkbox"/> Public Static IP Address	

Step 3

Enter
Name: SAP NetWeaver 7.51

Click on Step 3

1 Account Details 2 Instance Details 3 Virtual Machines

Advanced Mode: Create Instance

Select size and access points of the virtual machines:

Sizes

Virtual Machine	Size
Linux	DS13_v2 (8 cores, 56GB memory, SSD)
SAP Frontend	E4_v3 (4 cores, 32GB memory, HDD) SAP Tested
	E4S_v3 (4 cores, 32GB memory, SSD) SAP Tested
	E8_v3 (8 cores, 64GB memory, HDD) SAP Tested
	E8S_v3 (8 cores, 64GB memory, SSD) SAP Tested
	D12_v2 (4 cores, 28GB memory, HDD) SAP Tested
	DS12_v2 (4 cores, 28GB memory, SSD) SAP Tested
	D13_v2 (8 cores, 56GB memory, HDD) SAP Tested
	DS13_v2 (8 cores, 56GB memory, SSD) SAP Tested
System Files	38 GB
Swap	24 GB
OS Volume	30 GB

In the Sizes -> Virtual Maschine Section select **DS13_v2 (8 cores, 56GB memory, SSD)** for the Linux System

1 Account Details 2 Instance Details 3 Virtual Machines

Advanced Mode: Create Instance

Service: SSH
Type: Default

Linux	3200	0.0.0.0/	<input checked="" type="checkbox"/>
-------	------	----------	-------------------------------------

Service: SAP GUI
Type: Default

Linux	8443	0.0.0.0/	<input checked="" type="checkbox"/>
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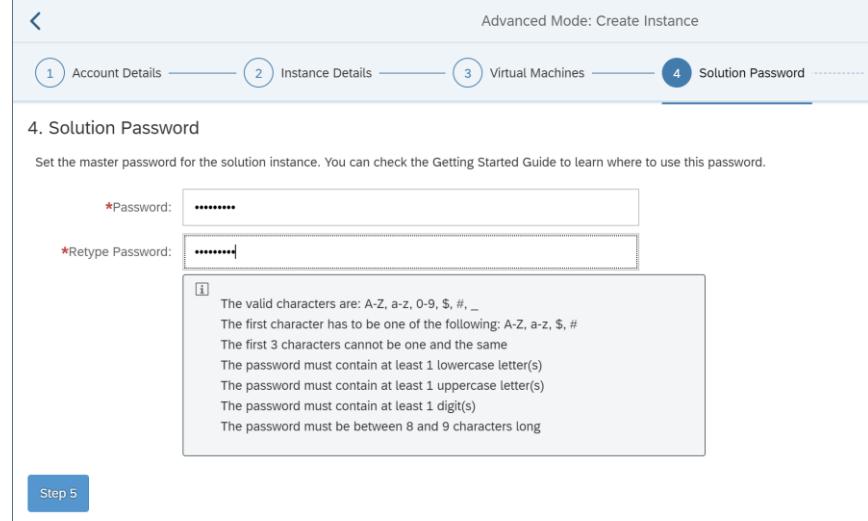
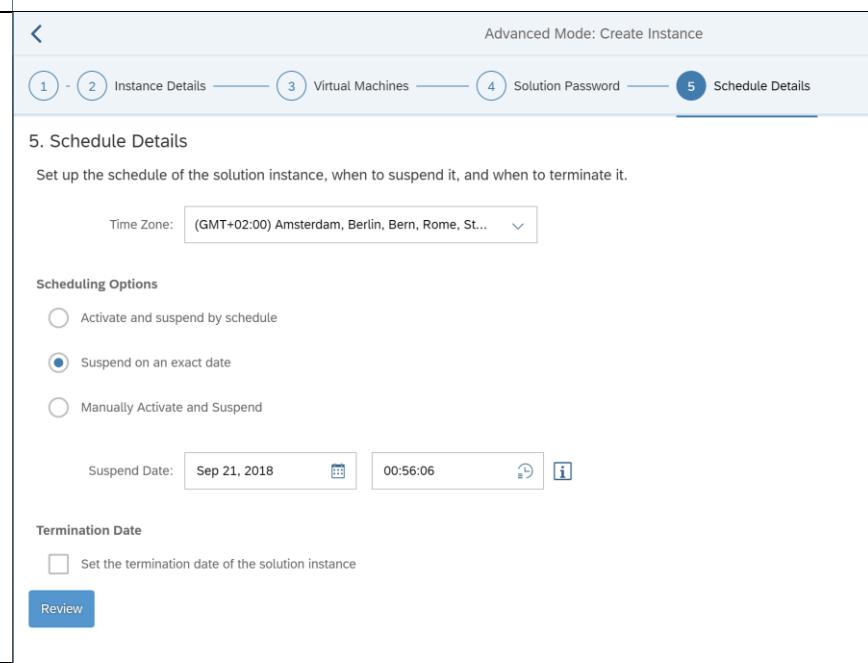
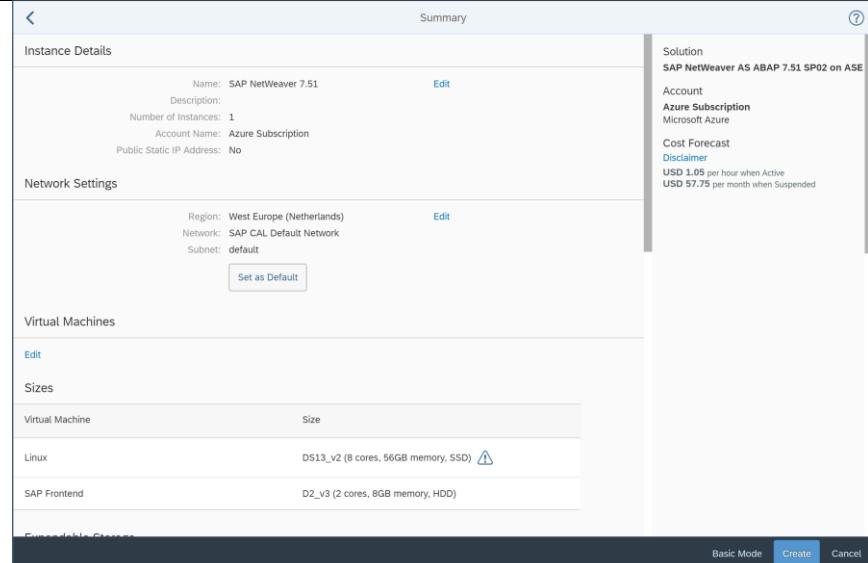
Service: Cloud Connector
Type: Default

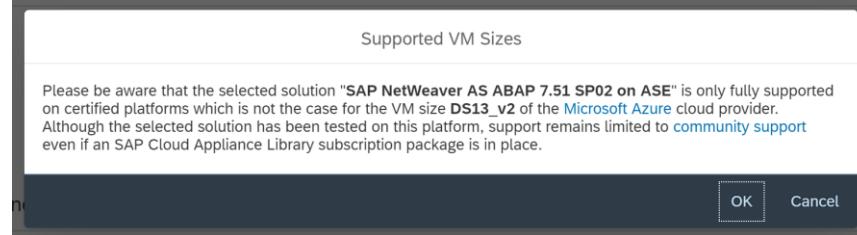
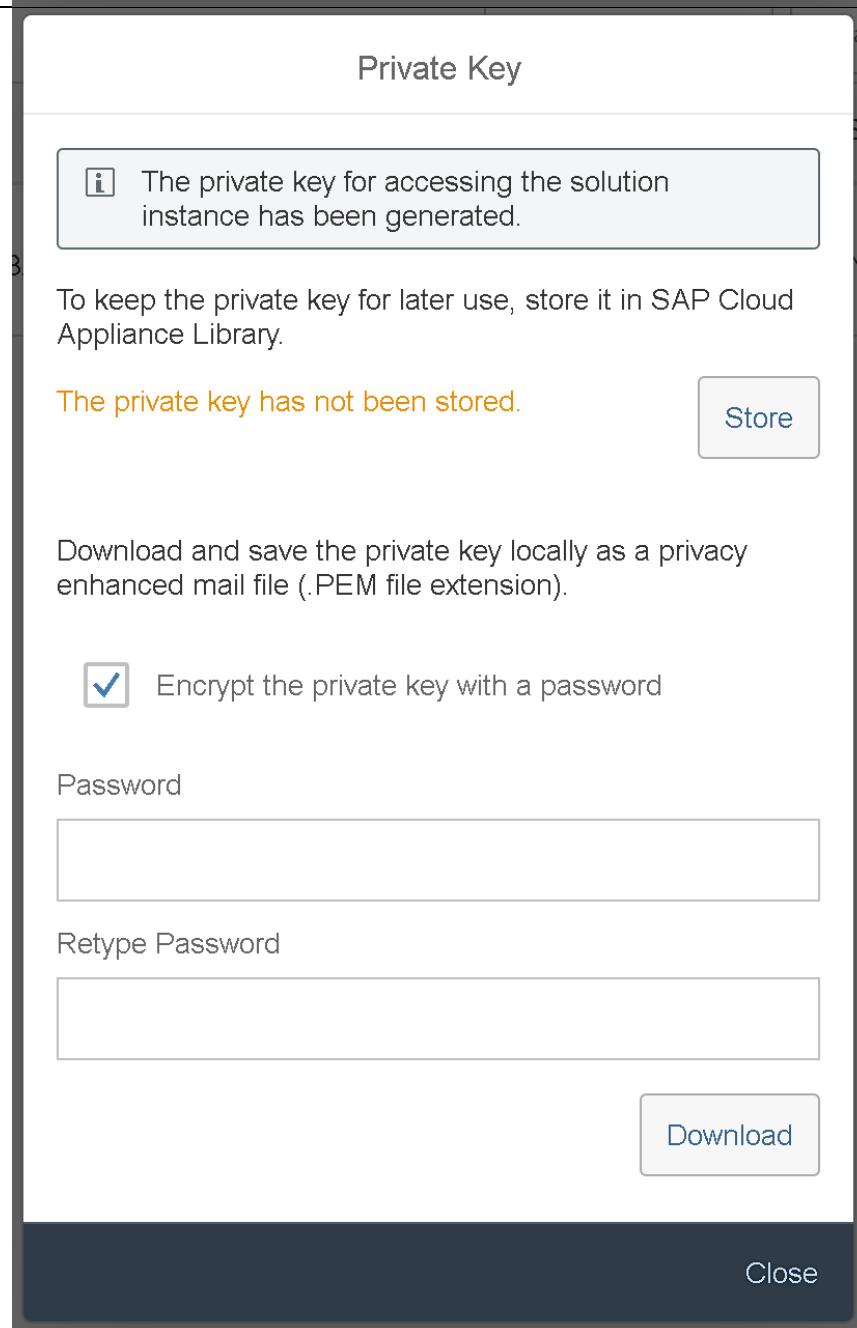
SAP Frontend	3389	0.0.0.0/	<input checked="" type="checkbox"/>
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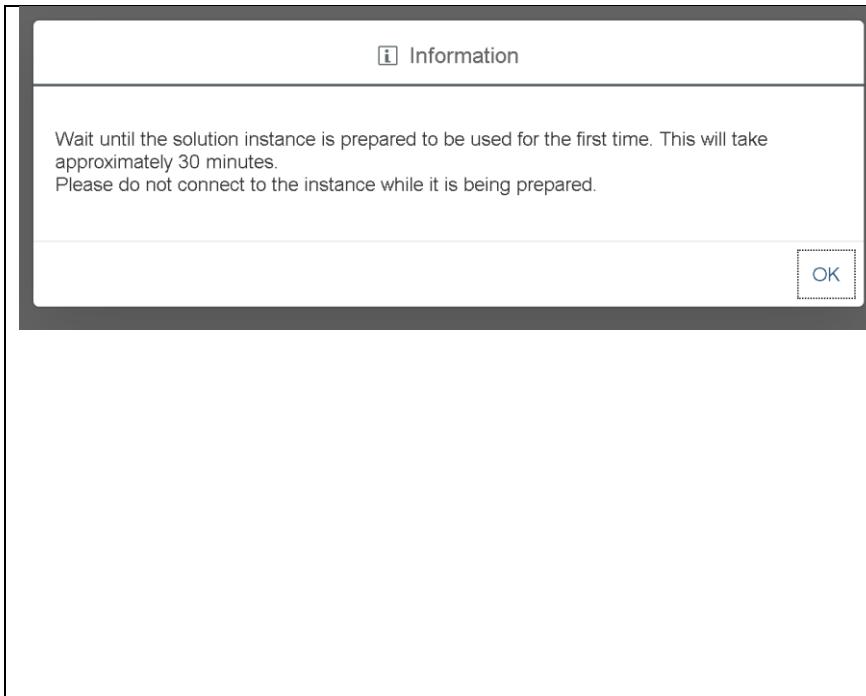
Service: RDP
Type: Default

Step 4

Scroll down and click on **Step 4**

 <p>4. Solution Password</p> <p>Set the master password for the solution instance. You can check the Getting Started Guide to learn where to use this password.</p> <p>*Password: <input type="password"/></p> <p>*Retype Password: <input type="password"/></p> <p>The valid characters are: A-Z, a-z, 0-9, \$, #, _ The first character has to be one of the following: A-Z, a-z, \$, # The first 3 characters cannot be one and the same The password must contain at least 1 lowercase letter(s) The password must contain at least 1 uppercase letter(s) The password must contain at least 1 digit(s) The password must be between 8 and 9 characters long</p> <p>Step 5</p>	Enter a password and click on Step 5						
 <p>5. Schedule Details</p> <p>Set up the schedule of the solution instance, when to suspend it, and when to terminate it.</p> <p>Time Zone: (GMT+02:00) Amsterdam, Berlin, Bern, Rome, St...</p> <p>Scheduling Options</p> <ul style="list-style-type: none"> <input type="radio"/> Activate and suspend by schedule <input checked="" type="radio"/> Suspend on an exact date <input type="radio"/> Manually Activate and Suspend <p>Suspend Date: Sep 21, 2018 00:56:06</p> <p>Termination Date</p> <p><input type="checkbox"/> Set the termination date of the solution instance</p> <p>Review</p>	Click on Review						
 <p>Summary</p> <p>Instance Details</p> <ul style="list-style-type: none"> Name: SAP NetWeaver 7.51 Description: Number of Instances: 1 Account Name: Azure Subscription Public Static IP Address: No <p>Network Settings</p> <ul style="list-style-type: none"> Region: West Europe (Netherlands) Network: SAP CAL Default Network Subnet: default <p>Virtual Machines</p> <table border="1"> <thead> <tr> <th>Virtual Machine</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>Linux</td> <td>DS13_v2 (8 cores, 56GB memory, SSD) !</td> </tr> <tr> <td>SAP Frontend</td> <td>D2_v3 (2 cores, 8GB memory, HDD)</td> </tr> </tbody> </table> <p>Cost Forecast</p> <p>USD 1.05 per hour when Active USD 57.75 per month when Suspended</p> <p>Create</p>	Virtual Machine	Size	Linux	DS13_v2 (8 cores, 56GB memory, SSD) !	SAP Frontend	D2_v3 (2 cores, 8GB memory, HDD)	And on Create
Virtual Machine	Size						
Linux	DS13_v2 (8 cores, 56GB memory, SSD) !						
SAP Frontend	D2_v3 (2 cores, 8GB memory, HDD)						

	<p>Confirm the selected VM by clicking OK</p>
 <p>Private Key</p> <p>i The private key for accessing the solution instance has been generated.</p> <p>To keep the private key for later use, store it in SAP Cloud Appliance Library.</p> <p>The private key has not been stored.</p> <p>Store</p> <p><input checked="" type="checkbox"/> Encrypt the private key with a password</p> <p>Password</p> <p>Retype Password</p> <p>Download</p> <p>Close</p>	<p>Click on Store to save the private key.</p> <p>You can also enter a Password and click on Download to download the key on your laptop.</p>



Deployment of the System takes around 30 minutes and additional 45 minutes to activate.

Click **OK** and wait.

Note: While waiting for the deployment, continue with step “

Configure Azure Event Hub”

The screenshot shows the SAP NetWeaver 7.51 instance details page. The top navigation bar includes 'Instances /' and 'SAP NetWeaver 7.51'. The main content area displays the following information:

Owned By: ABAP SDK Hackathon
(P2000532948)
Created On: Aug 16, 2018, 08:39:51
Next Suspend At: Aug 16, 2018, 16:38:14

Status: Active

Cost Forecast:
Disclaimer
USD 0.56 per hour when Active
USD 20.93 per month when Suspended

Navigation tabs: INFO, LICENSE STATUS, SOLUTION INFO, VIRTUAL MACHINES, SAP SYSTEMS, SCHEDULE

Account: Azure Subscription
Region: West Europe (Netherlands)

Cloud Provider: Microsoft Azure
Network: SAPCALDefault-westeuropa
Subnet: default

IP Addresses:
Public Static IP Address: 137.117.227.132
Termination Protection: 10.0.0.248
Linux Internal IP Address
Linux External IP Address

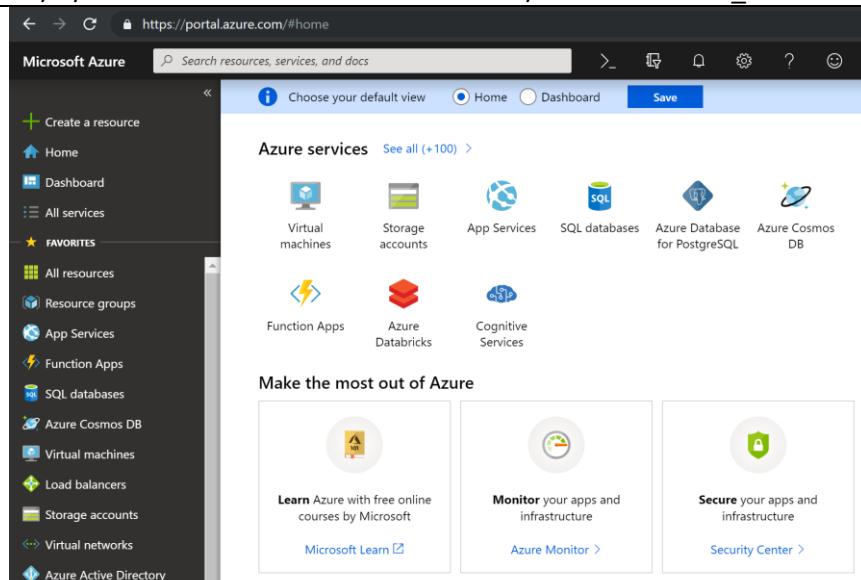
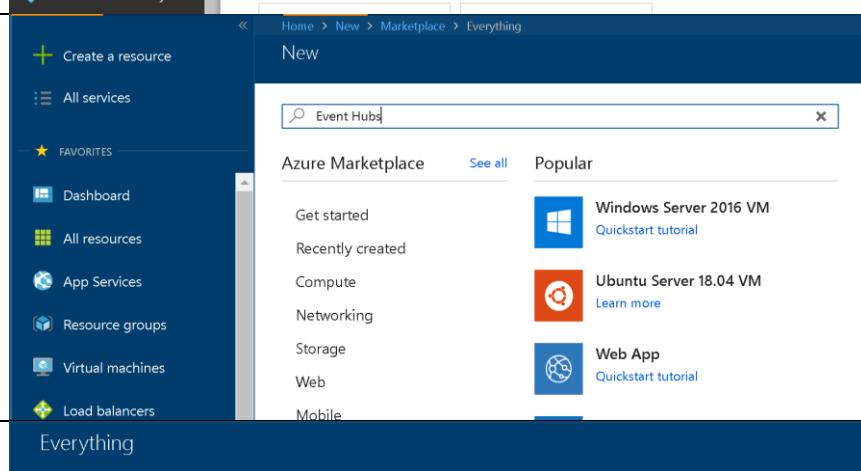
Configure Azure Event Hub

The Azure Event Hub is a Big Data streaming platform and event ingestion service, capable of receiving and processing millions of events per second. Event Hubs can process and store events, data, or telemetry produced by distributed software and devices. Data sent to an event hub can be transformed and stored using any real-time analytics provider or batching/storage adapters.

In our example we will use the Azure Event hub to retrieve a very small number of SAP Flight Information (based on the famous SAP FLIGHT (SFLIGHT) Model) and process it later on.

For more information on the Azure Event Hub check out <https://azure.microsoft.com/en-us/services/event-hubs/> More information on SFLIGHT can be found here

https://help.sap.com/doc/saphelp_nw70/7.0.31/en-US/cf21f304446011d189700000e8322d00/content.htm?no_cache=true

	To retrieve information from SAP you need to setup an Event Hub in Azure. Log on to http://portal.azure.com with your Microsoft User. Note: The Azure portal might still be open in another Browser Tab.
	Click on + Create a resource and enter Event Hubs (Hit Enter to start the search)
	From the list of results select Events Hubs from Microsoft

Event Hubs

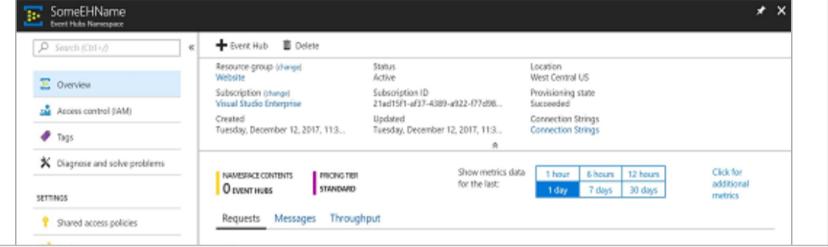
Microsoft

Azure Event Hubs is a highly scalable publish-subscribe service that can ingest millions of events per second and stream them into multiple applications. This lets you process and analyze the massive amounts of data produced by your connected devices and applications.

Use Event Hubs to:

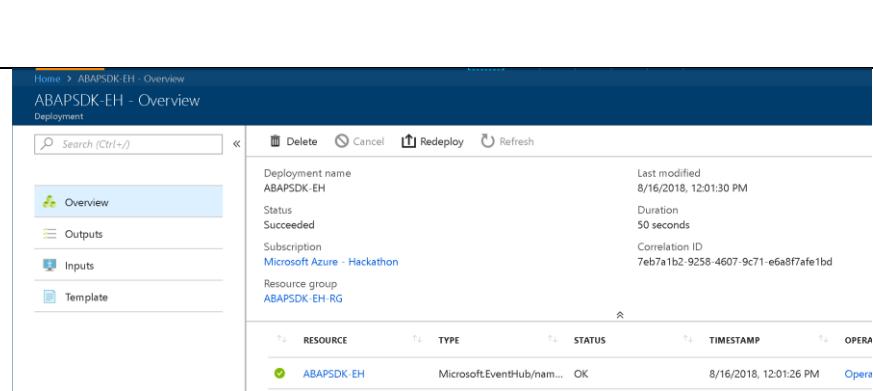
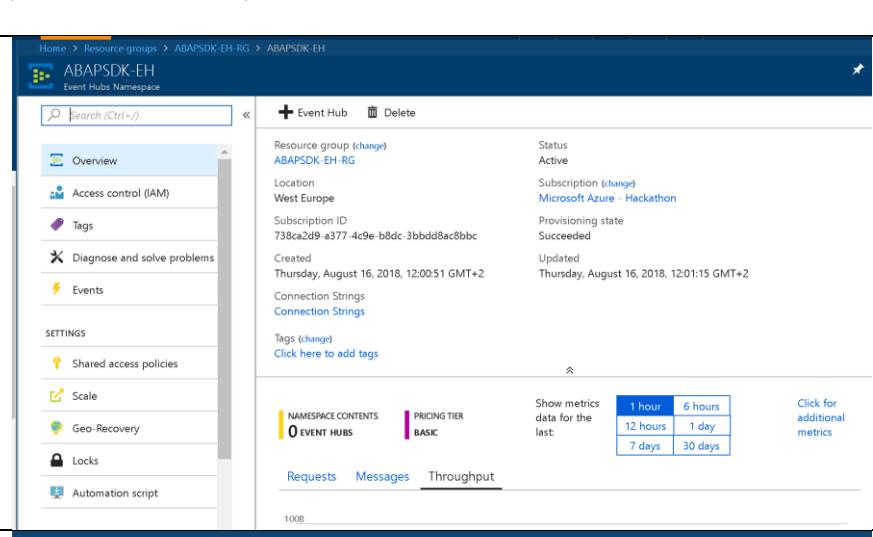
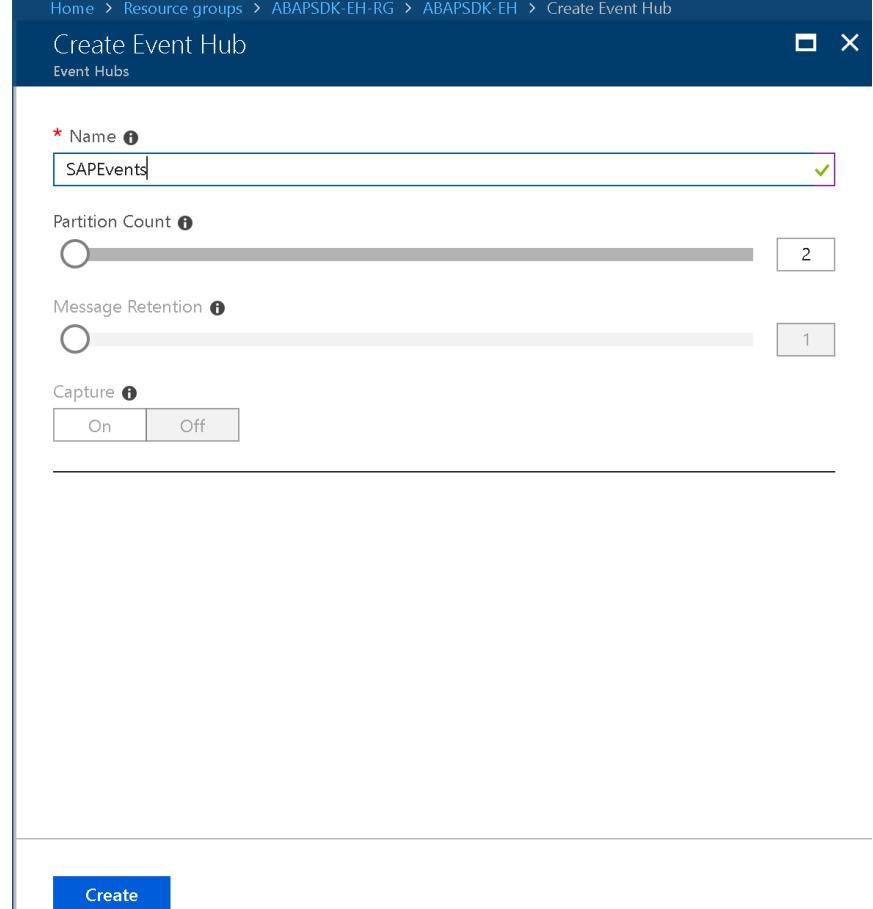
- Log millions of events per second in near real time.
- Connect devices using flexible authorization and throttling.
- Use time-based event buffering.
- Get a managed service with elastic scale.
- Reach a broad set of platforms using native client libraries.
- Pluggable adapters for other cloud services.

[Save for later](#)

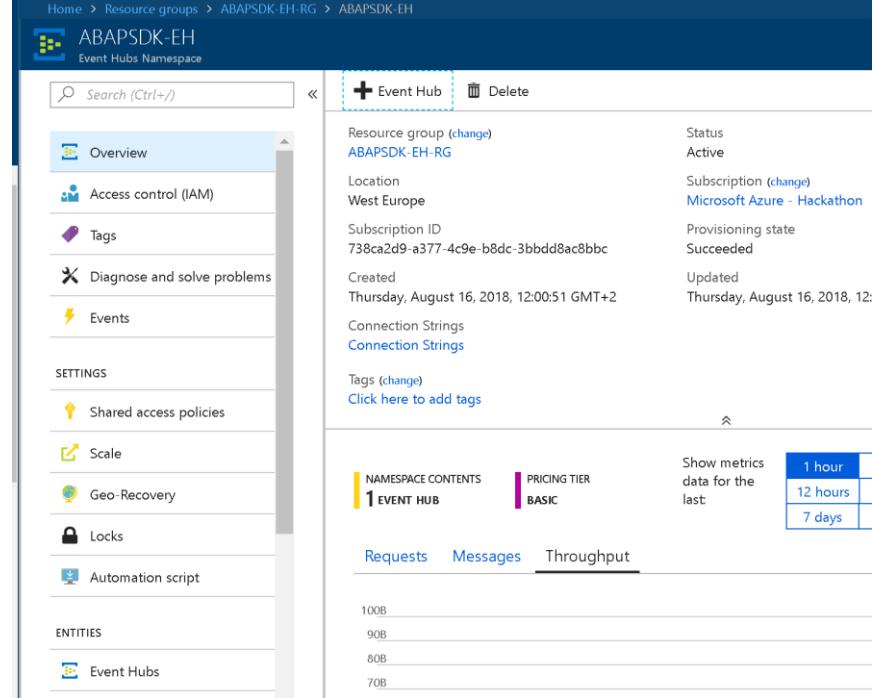


And click on **Create**

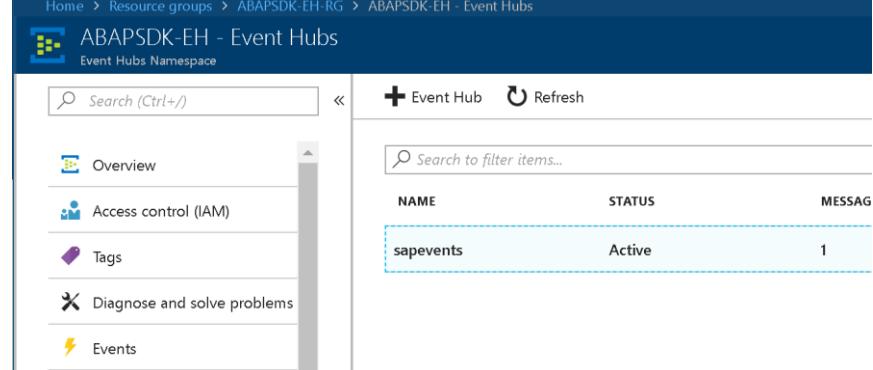
<p>The screenshot shows the 'Create Namespace' dialog for Event Hubs. The 'Name' field is set to 'ABAPSDK-EH-HBR'. The 'Pricing tier' is 'Basic (1 Consumer group, 100 Brokered co...)' and the 'Subscription' is 'Azure Pass - Sponsorship'. The 'Resource group' dropdown shows '(New) ABAPSDK_EH-RG' with a 'Create new' link. The 'Location' is 'West Europe'. The 'Throughput Units' slider is at 1. There is also an unchecked checkbox for 'Enable Auto-Inflate'. A large blue 'Create' button is at the bottom.</p>	<p>Enter details for Name: ABAPSDK-EH-<yourname></p> <p>Note: Since the name will also be part of a URL, make sure it is unique (e.g. add your initials)</p> <p>Pricing tier: Basic Resource Group: Click on Create New and enter: ABAPSDK_EH-RG Location: West Europe</p> <p>Note: Make sure to write down the Name (e.g. abasdk-eh.servicebus.windows.net). This is the Event Hub Namespace that we will user later on.</p> <p>Click on Create</p>
<p>The screenshot shows a deployment notification in the Azure portal. It says 'Deployment succeeded' for 'Deployment 'ABAPSDK-EH-HBR'' to resource group 'ABAPSDK_EH-RG'. The message continues: 'Event Hubs is a highly scalable way to stream them into your applications. Lots of data produced...' and ends with 'Deployment succeeded'.</p>	<p>Once you get a notification that the deployment was successful go to the resource by clicking on the provided link 'ABAPSDK-EH'</p> <p>Note: If the notification is gone again, just click on the bell-symbol to get the latest notifications</p>

	<p>And click on the Resource, ABAPSDK-EH</p> <p>Note: You can also get there via Resource Group -> ABAPSDK-EH-RG (Your Resource Group) -> ABAPSDK-EH (your Event Hub)</p>
	<p>In the Event Hub Namespace screen click on + Event Hub</p>
	<p>Enter a Name: SAPEvents And click on Create</p> <p>Note: Note down the name for the Event Hub Instance (e.g. SAPEvents) as well.</p>

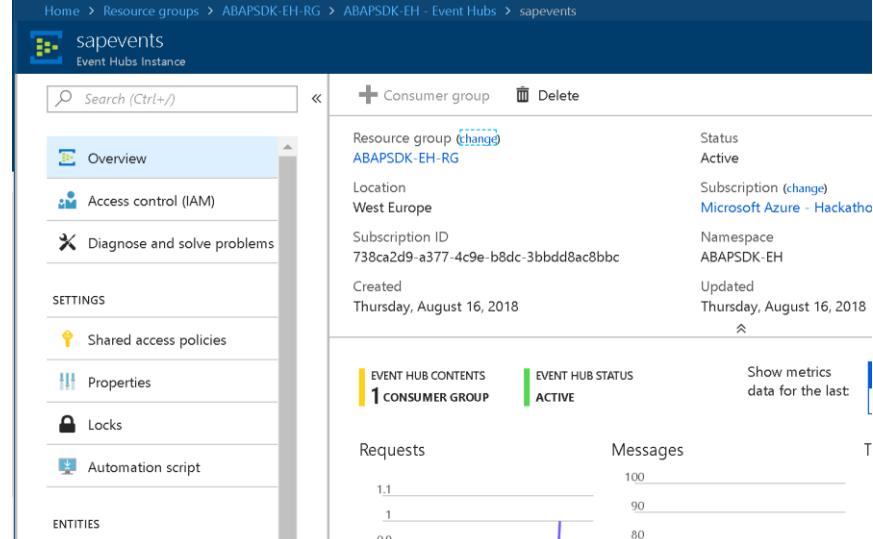
Once the creation of the Event Hub is finished, click on Entities -> **Event Hubs**



Click on the **sapevents** Event Hub, that you just created



In the sapevents Event Hub instance click on **Shared access policies** to create and retrieve access keys that allow to connect to the Event Hub

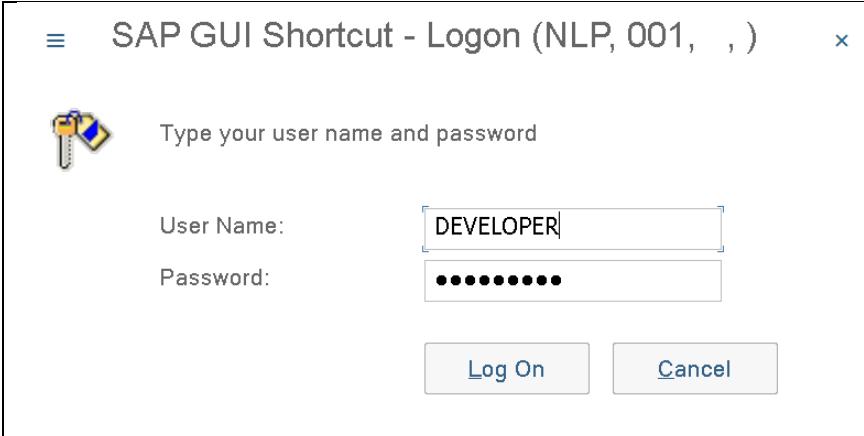
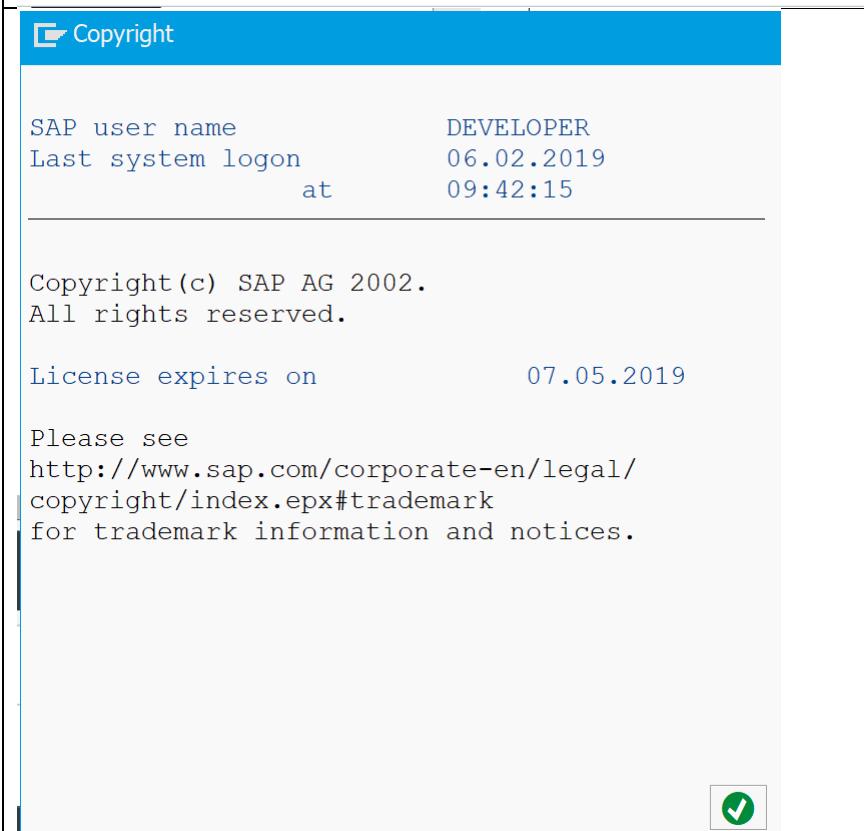
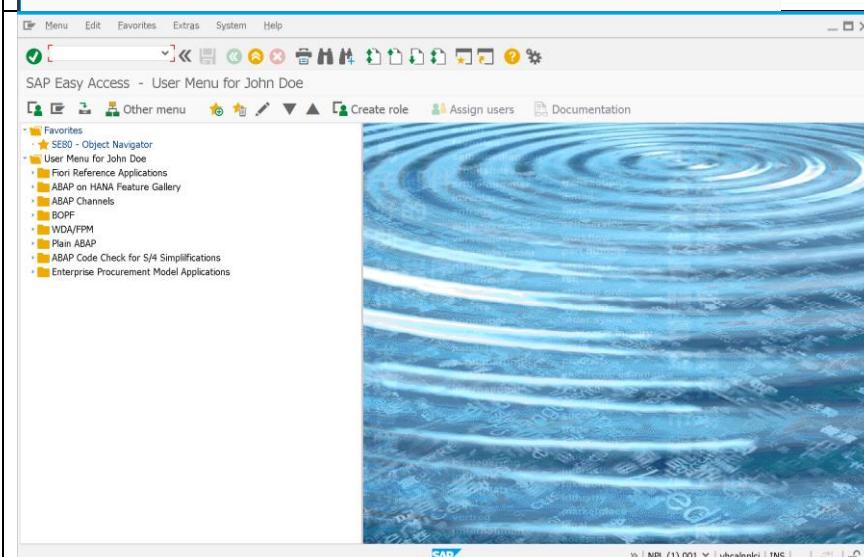


	<p>Click on + Add</p>
	<p>On the right hand side, Add the Policy Name RootManageSharedAccessKey And select Manage. Then click on Create.</p>
	<p>Once the policy is created, click on the policy again to retrieve Primary key and Endpoint information. Make sure to note both of them down.</p> <p>Note: Since you will need this information in SAP later on, copy and paste the Primary key values in Notepad</p>

 Unbenannt - Editor Datei Bearbeiten Format Ansicht ? Namespace: abasdk-eh.servicebus.windows.net Event Hub Instance: sapevents Primary Key: Pzz1NAmy7kshdniULH+o7Q+FnljWsxE5BnqBvKdKU/A=	Information you should have in Notepad now
--	--

Connect to the SAP System using the SAP GUI

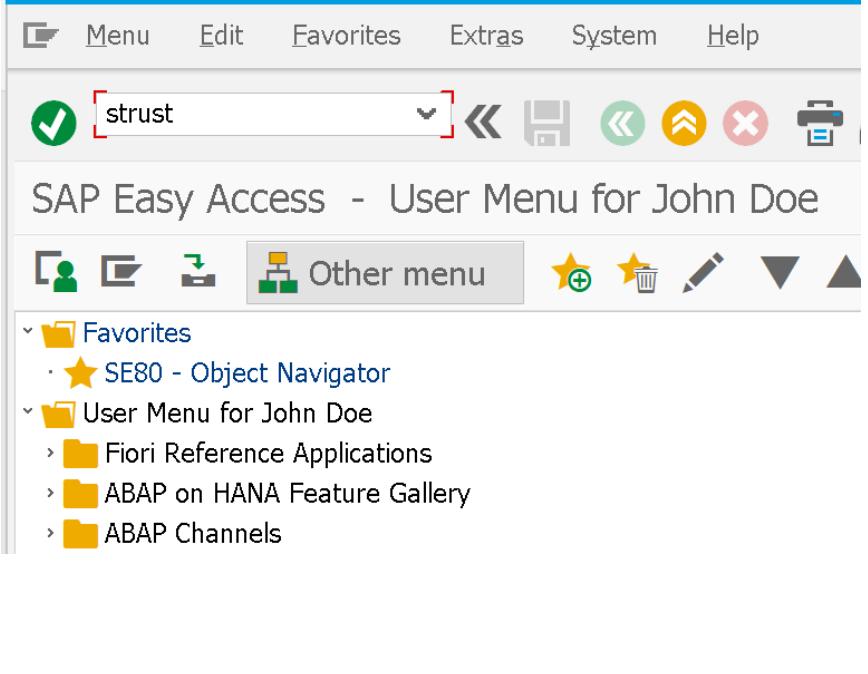
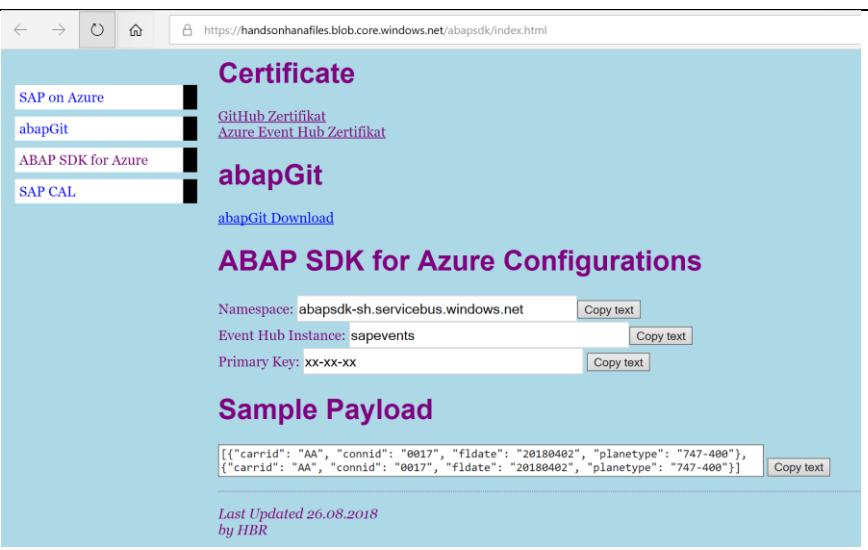
	<p>Go to the Instance you just created and click on Connect</p> <p>Note: If you do not have an SAP GUI Installed on your laptop, please follow the steps outlined at the end of the document to connect via Remote Desktop to a Front-End System.</p>
	<p>Select Client 001 and click on Connect</p>
	<p>A link to the SAP-GUI with the required connection details is downloaded. Open it and click on Accept if required.</p>

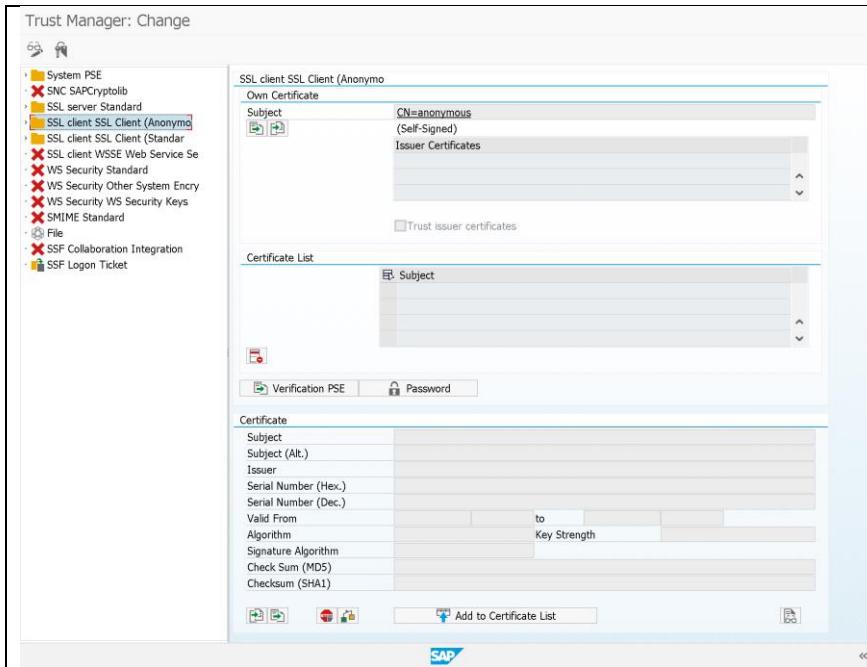
 <p>Type your user name and password</p> <p>User Name: <input type="text" value="DEVELOPER"/></p> <p>Password: <input type="password" value="*****"/></p> <p><input type="button" value="Log On"/> <input type="button" value="Cancel"/></p>	<p>Login with user DEVELOPER and the Password you had previously provided</p> <p>Note: If prompted make sure that Logon Language is EN (otherwise you might have some wired issues with abapGit)</p>
 <p>SAP user name DEVELOPER Last system logon 06.02.2019 at 09:42:15</p> <p>Copyright (c) SAP AG 2002. All rights reserved.</p> <p>License expires on 07.05.2019</p> <p>Please see http://www.sap.com/corporate-en/legal/copyright/index.epx#trademark for trademark information and notices.</p>	<p>Confirm the Copyright agreement.</p> <p>Note: Since this is the startup of the SAP System for the first time, it can take a some time before you see this screen</p>
 <p>SAP Easy Access - User Menu for John Doe</p> <p>Favorites</p> <ul style="list-style-type: none"> SE80 - Object Navigator User Menu for John Doe Fiori Reference Applications ABAP on HANA Feature Gallery ABAP Channels BOPF WDA/FPM Plain ABAP ABAP Code Check for S/4 Simplifications Enterprise Procurement Model Applications 	<p>Your own SAP System is now available and ready to use!</p>

Setup SSL Trust

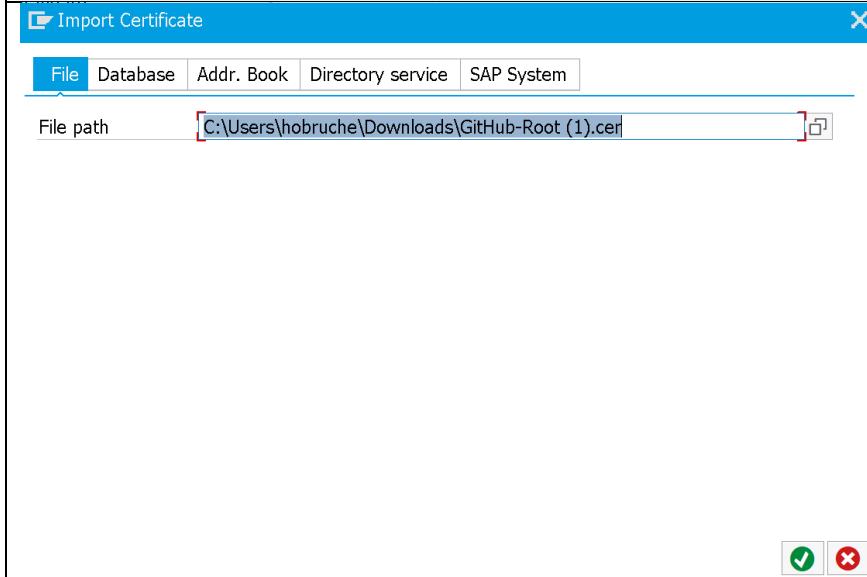
Unlike popular browsers an SAP systems does not come with preinstalled root SSL certificates for security reasons. Administrators have to make a conscious decision and import the SSL certificate that are required for individual scenarios.

In the following steps you will import SSL certificates from GitHub (required to use the abapGit program) and Azure (to connect to Azure Event Hub).

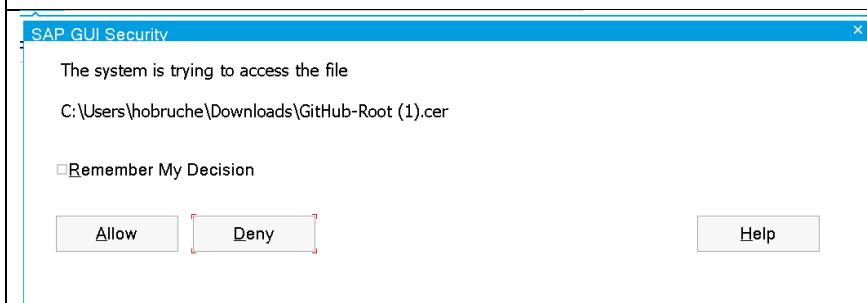
	<p>In order to access site from GitHub and later on from Azure we need to import SSL Certificates.</p> <p>We have downloaded both Root Certificates and made them available for easier access.</p> <p>Go to Transaction STRUST</p> <p>Note: As before this is the first time you are calling this transaction, so it might take some time to open up.</p>
	<p>Open http://aka.ms/sap/GitHubSSL to download the GitHub certificate and http://aka.ms/sap/AzureBusSSL to download the necessary Azure Service Bus Site SSL.</p>



In Trust Manager, Click on the **Edit Button**, then double click on **SSL client SSL Client (Anonymous)** And click on the **Import Certificate** button at the bottom of the screen.

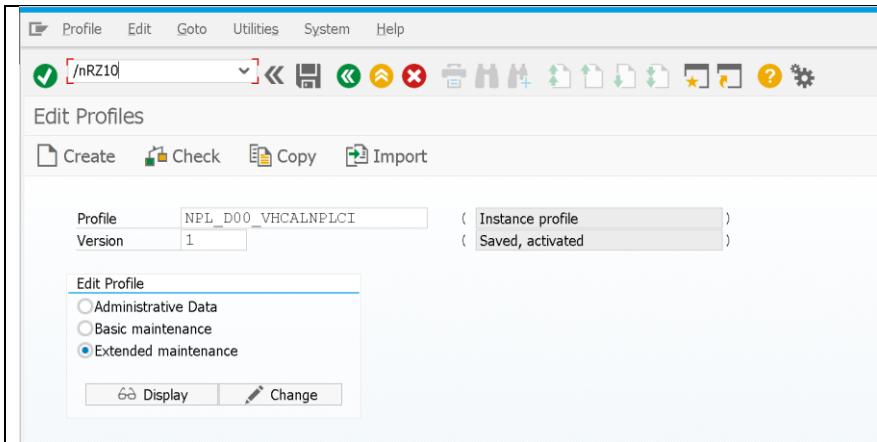


Select the GitHub Certificate and click on **OK**

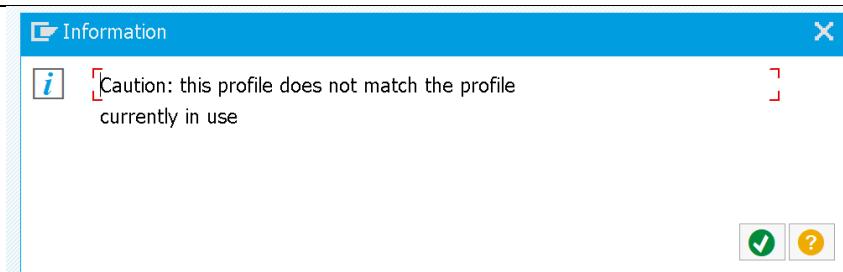


Click on **Allow**

<p>The screenshot shows the SAP Trust Manager interface. At the top, there's a 'Certificate List' window with a 'Subject' field and a 'Verification PSE' button. Below it is a 'Certificate' details window with fields like Subject, Issuer, Serial Number (Hex.), Valid From, Algorithm, etc. A 'Add to Certificate List' button is visible. Below these is an 'Import Certificate' dialog box with tabs for File, Database, Addr. Book, Directory service, and SAP System. The 'File' tab is selected, showing a 'File path' field containing 'C:\Users\hobruche\Downloads\ServiceBus-Root (1).cer'. There are also 'Import' and 'Cancel' buttons. At the bottom is a 'Trust Manager: Change' window with a tree view of security components and a 'Certificate List' table.</p>	<p>Click on Add to Certificate List to add the GitHub Certificate to the Certificate List</p> <p>Note: If the Add to Certificate List button is still greyed out, make sure you are in the Edit Mode</p> <p>Repeat the same steps and import the remaining certificates:</p> <p>Azure SSL Certificate</p> <p>As a result you should have two certificates in the Certificate List.</p> <p>Hit Strg-S to save all changes.</p>
---	---

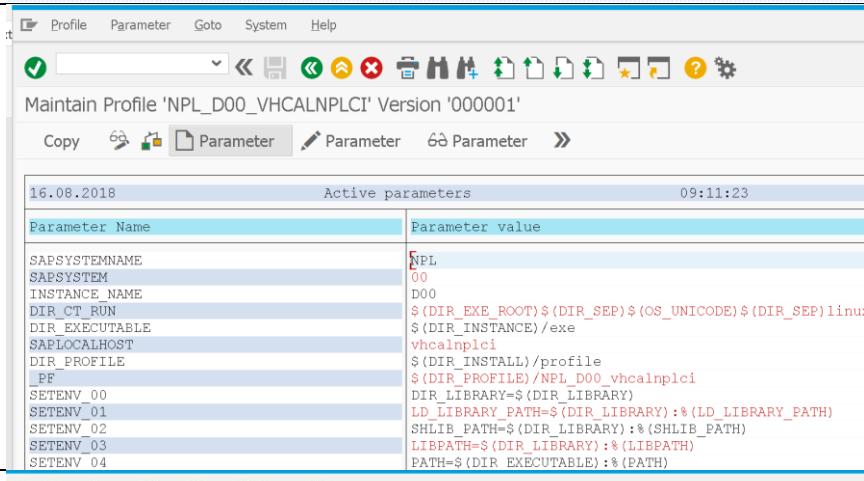


Since GitHub is abort/rejecting TLSv1.0 handshakes the SAP systems needs to be configured accordingly.

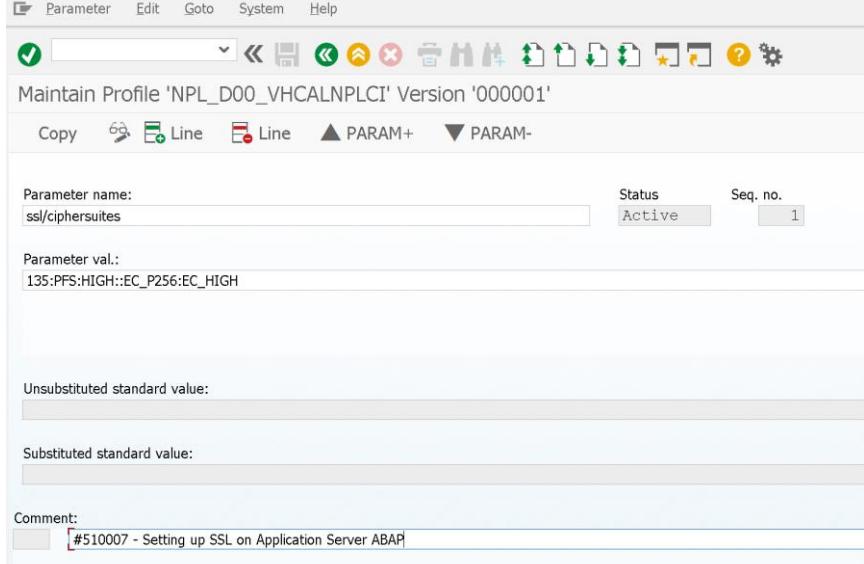


Go to transaction **/nRZ10**, select the Profile **NPL_D00_VHCALNPLCI**, Version: 1 Select Extended maintenance And click on **Change**

Click **OK** on the Information screen



Click on **Parameter** to add a new Parameter to the profile



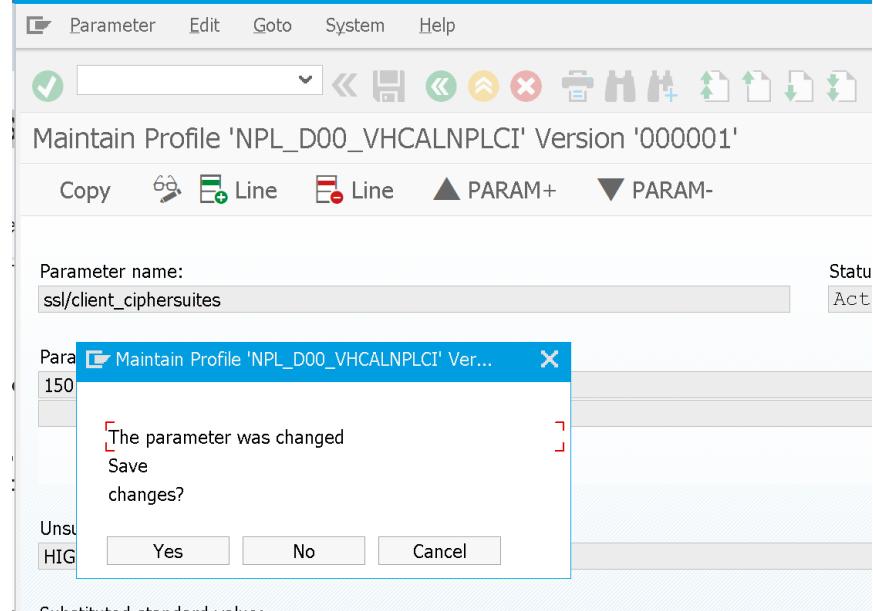
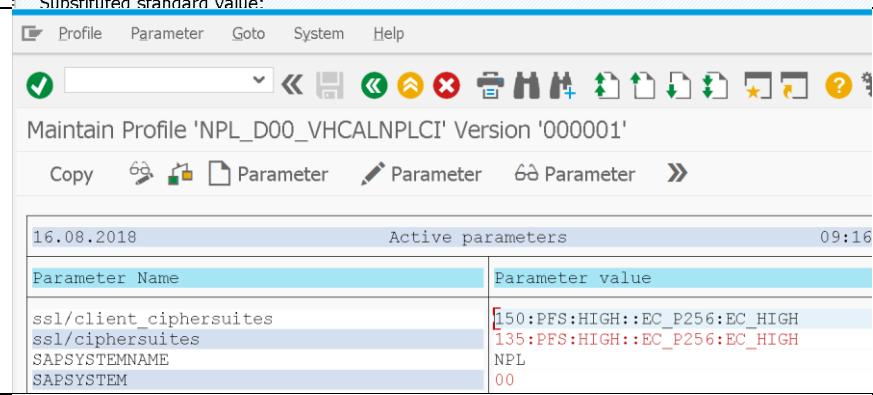
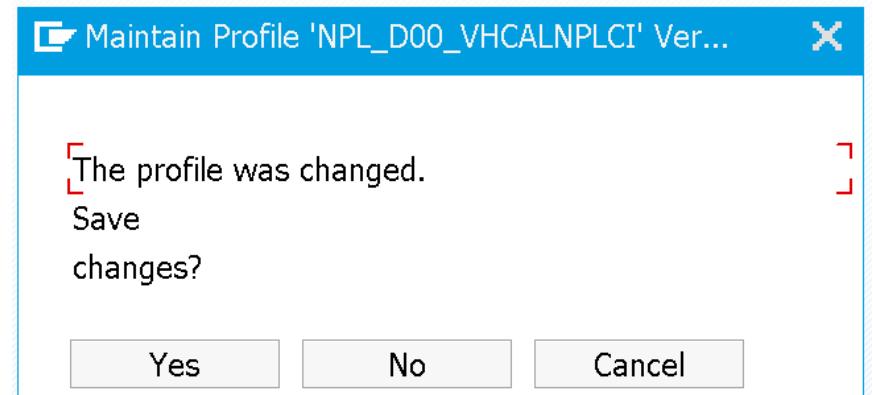
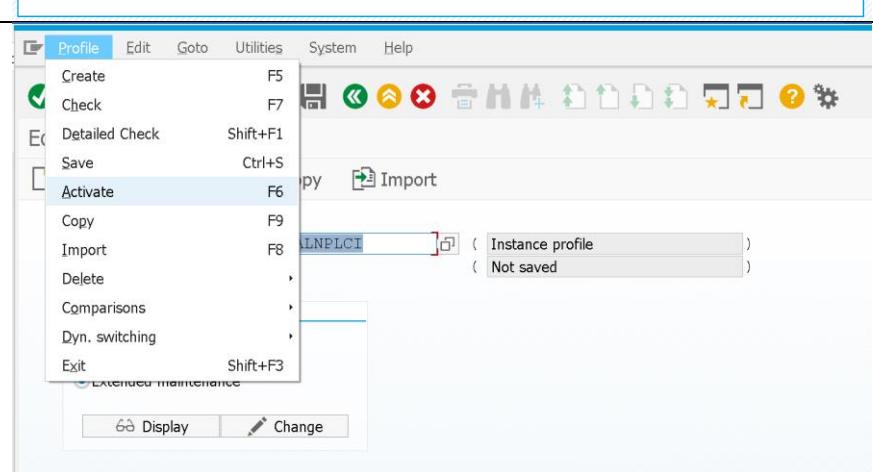
Enter the following
Parameter name
ssl/ciphersuites

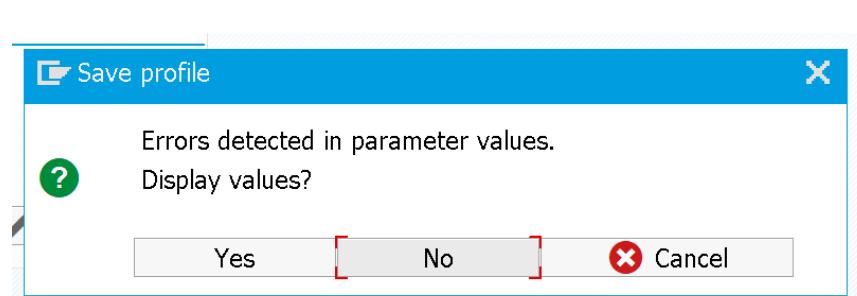
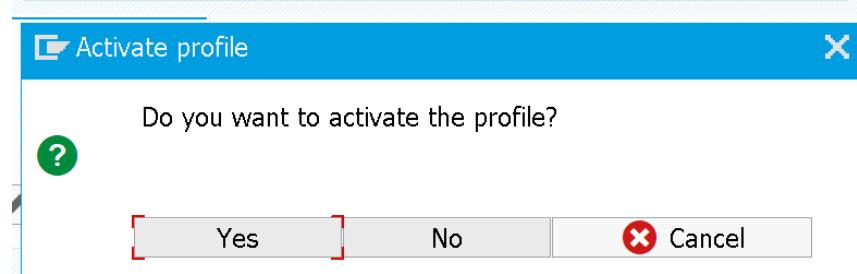
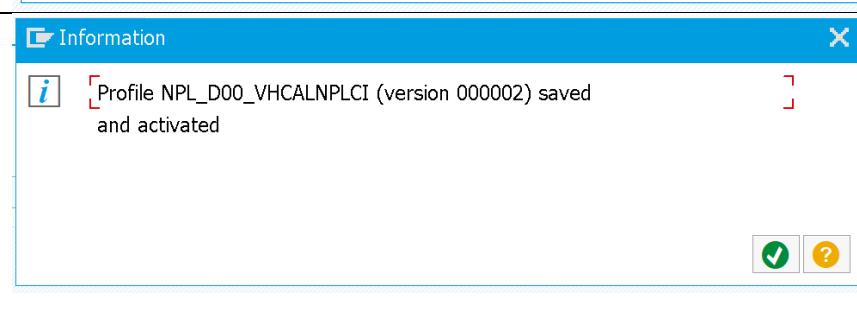
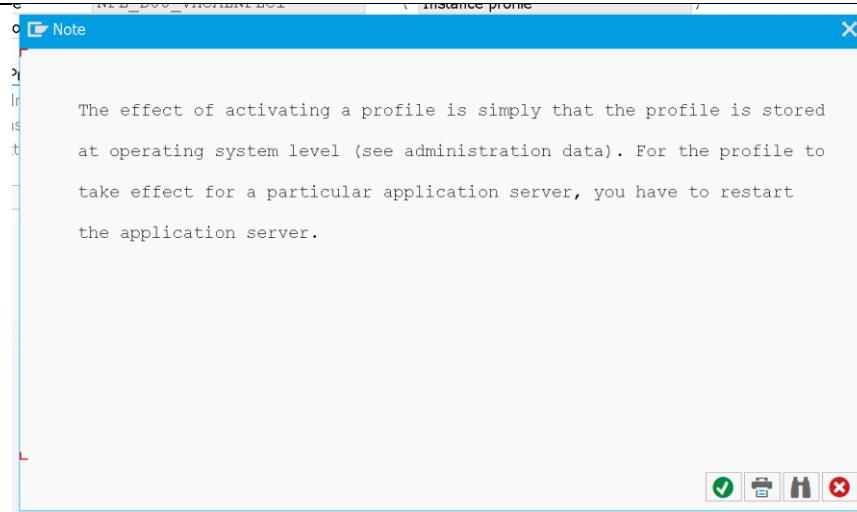
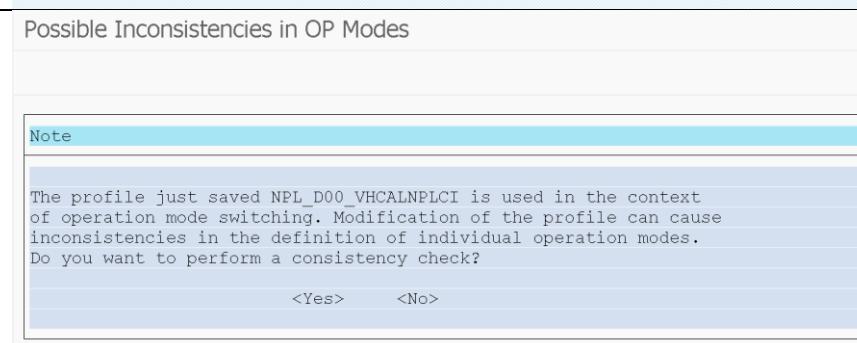
Parameter value:
135:PFS:HIGH::EC_P256:EC_HIGH

and click on **Copy**

Note: This configuration is outlined in SAP Note 510007 - Setting up SSL on Application Server ABAP

	<p>Go back and Save the changes.</p>
	<p>You should see the new parameter. Click again on Create Parameter to add another parameter</p>
	<p>Enter the following value Parameter name: ssl/client_ciphersuites</p> <p>Parameter value: 150:PFS:HIGH::EC_P256:EC_HIGH</p> <p>and click on Copy</p>

	<p>Again go back and save the changes.</p>
	<p>You should now see both new parameters in the list. Click on Back</p> <p>Note: Check again your entries for typos!</p>
	<p>Click on Yes to save the changes.</p>
	<p>Save (Strg-S) the changes and Activate (F6) the profile</p>

 <p>Save profile</p> <p>Errors detected in parameter values.</p> <p>Display values?</p> <p>Yes No Cancel</p>	<p>Note: If you get error message, just ignore them and continue the activation.</p> <p>Note: You can click on Yes to activate the profile.</p>
 <p>Activate profile</p> <p>Do you want to activate the profile?</p> <p>Yes No Cancel</p>	
 <p>Information</p> <p>Profile NPL_D00_VHCALENPLCI (version 000002) saved and activated</p> <p>✓ ?</p>	<p>As a result you should get an information that the Profile was saved and activated.</p> <p>Note: Please make sure that the profile is also activated and not only saved.</p>
 <p>The effect of activating a profile is simply that the profile is stored at operating system level (see administration data). For the profile to take effect for a particular application server, you have to restart the application server.</p> <p>✓ ? ! ✘</p>	<p>In order to use this newly activated profile, you have to restart the application server.</p> <p>Click on OK</p>
<p>Possible Inconsistencies in OP Modes</p>  <p>Note</p> <p>The profile just saved NPL_D00_VHCALENPLCI is used in the context of operation mode switching. Modification of the profile can cause inconsistencies in the definition of individual operation modes. Do you want to perform a consistency check?</p> <p><Yes> <No></p>	<p>Just keep this page as is and continue with the next step.</p>

For this go back to the SAP Cloud Appliance Library, select your Instance, if required click on the three dots and click on **Reboot**

Click on **OK** to gracefully shutdown the SAP system and restart it.

After a few minutes (5 or so) you should be able to connect to the SAP system again.

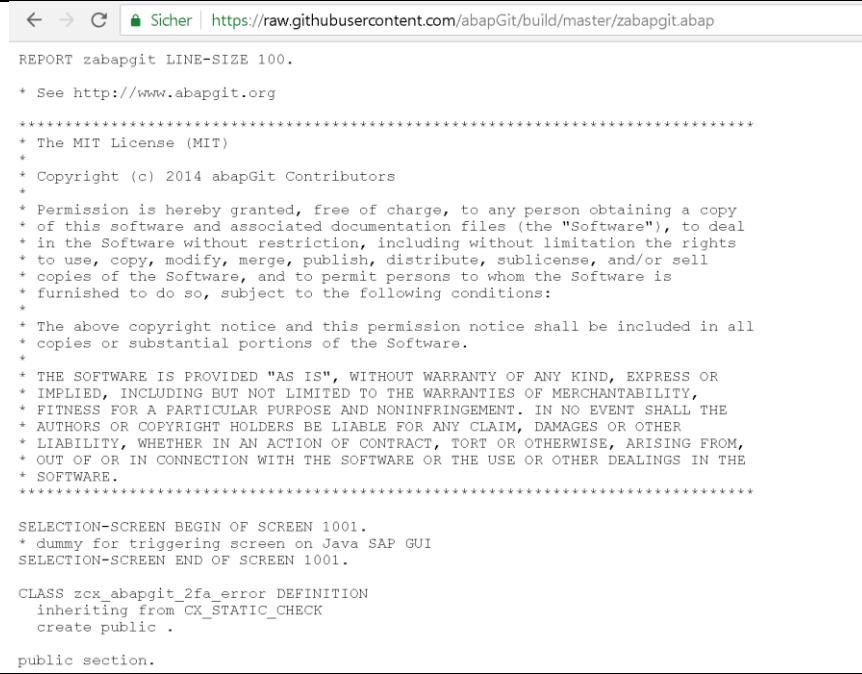
Just try to connect to the System via SAP GUI a few times 😊

Note: When reconnecting just make sure to select Client 001 again!

Install abapGit

abapGit is a git client for ABAP. It dramatically simplifies the way how you can work with custom developments and version control via Git in your SAP system. At the same time abapGit also makes it extremely easy to import other applications into your ABAP system.

More details about abapGit can be found at <http://docs.abapgit.org/>



REPORT zabapgit LINE-SIZE 100.
* See <http://www.abapgit.org>

* The MIT License (MIT)
*
* Copyright (c) 2014 abapGit Contributors
*
* Permission is hereby granted, free of charge, to any person obtaining a copy
* of this software and associated documentation files (the "Software"), to deal
* in the Software without restriction, including without limitation the rights
* to use, copy, modify, merge, publish, distribute, sublicense, and/or sell
* copies of the Software, and to permit persons to whom the Software is
* furnished to do so, subject to the following conditions:
*
* The above copyright notice and this permission notice shall be included in all
* copies or substantial portions of the Software.
*
* THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR
* IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY,
* FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE
* AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER
* LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
* OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE
* SOFTWARE.

SELECTION-SCREEN BEGIN OF SCREEN 1001.
* dummy for triggering screen on Java SAP GUI
SELECTION-SCREEN END OF SCREEN 1001.

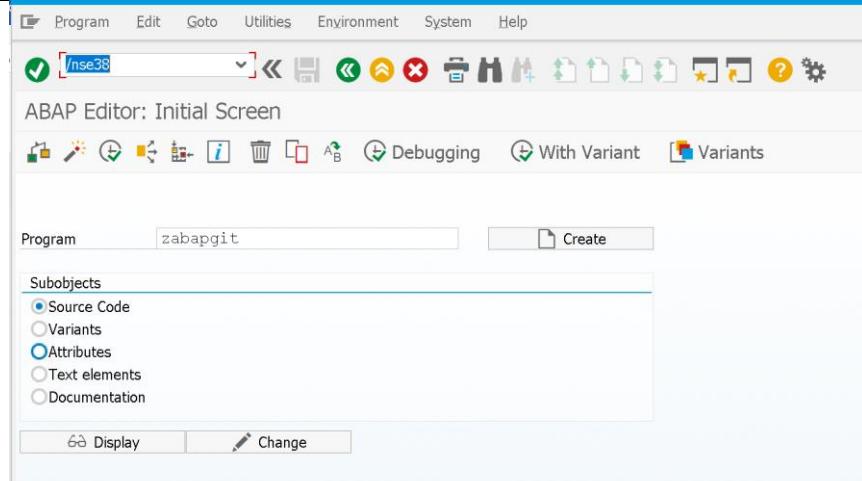
CLASS zcx_abapgit_2fa_error DEFINITION
 inheriting from CX_STATIC_CHECK
 create public .

 public section.

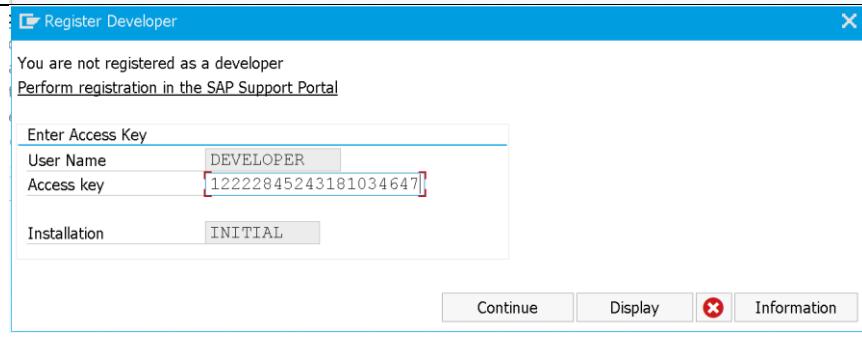
Download the latest version of abapGit from <http://aka.ms/sap/abapgit>

You can also just Copy all (Strg-A) to the Clipboard (Strg-C)

Note: The official site can be reached via https://github.com/lars_hp/abapGit



Go the Transaction /NSE38
Enter the program name **zabapgit** and click on **Create**

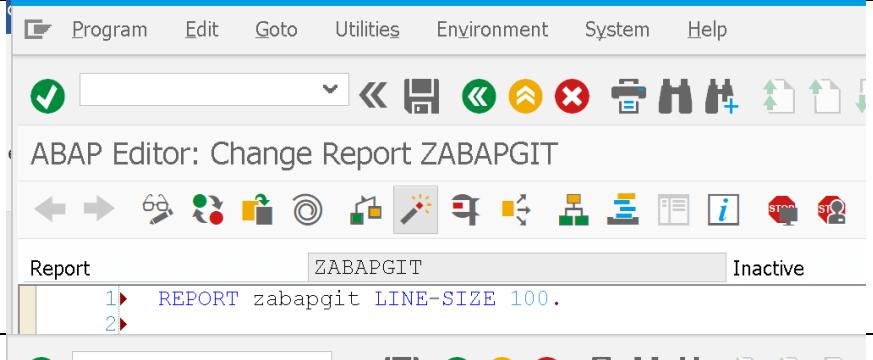
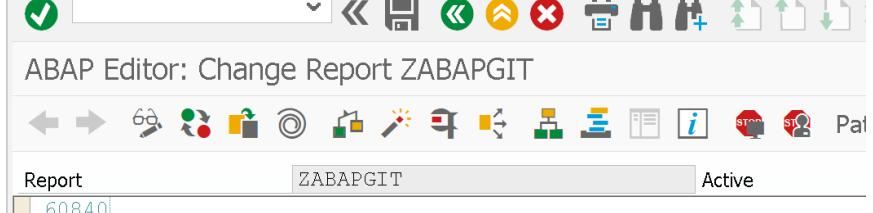


Enter the **developer Key**
12222845243181034647
7

And click on **Continue**

Note: You can also get the Developer key from the official CAL documentation for this solution at <https://caldocs.hana.ondemand.com/caldocs/h>

	Help/Getting Started_N WasABAP751_SP02_AS E.pdf
	Enter the Title zabapGit and select the Type Executable program . Then click on Save
	Select Local Object
	Copy and paste (replace whatever was there before) the content from abapGit in the screen

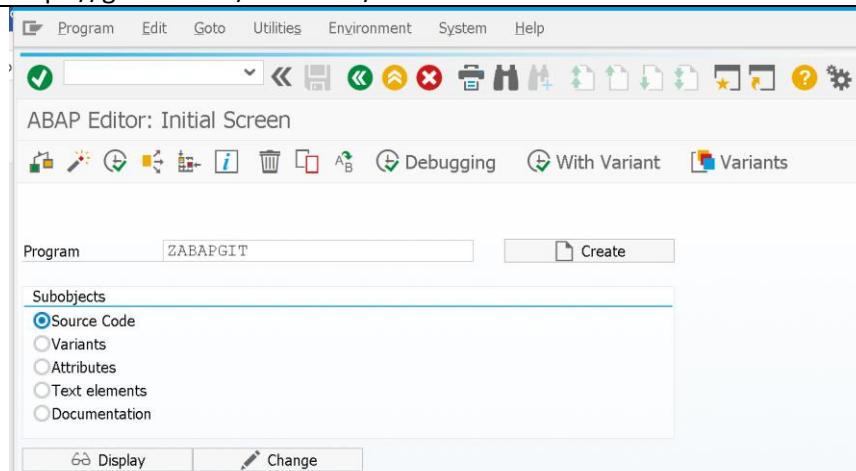
 <p>ABAP Editor: Change Report ZABAPGIT</p> <p>Report ZABAPGIT Inactive</p> <pre>1 REPORT zabapgit LINE-SIZE 100. 2</pre>	<p>Click on Activate to Save and Activate the program.</p> <p>The status should change to Active.</p>
 <p>ABAP Editor: Change Report ZABAPGIT</p> <p>Report ZABAPGIT Active</p> <pre>60840</pre>	<p>Note: Activation takes a few minutes.</p> <p>The resulting screen should also show Status as Active</p>

Install ABAP SDK for Azure

The ABAP SDK for Azure simplifies the way how ABAP developers can work and consume services from Azure. RFC destinations, configurations and security settings are consolidated to help organizations track and monitor traffic between their SAP systems and Azure.

More information about the ABAP SDK for Azure can be found at

<https://github.com/Microsoft/ABAP-SDK-for-Azure>

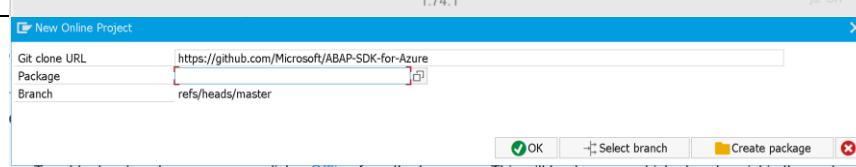


If required go back to transaction /nSE38 and enter **zabapgit** as the program name.

Hit **F8** to run the program.

A screenshot of the abapGit interface. It shows a "Tutorial" section with a "Adding and cloning repos" subsection containing instructions for cloning remote repos. Below this is a "Repository list and favorites" section with instructions for favoriting repos. At the bottom is a "abapGit repository" section with a note about installing it as a repository.

In abapGit click on + **Online** to retrieve ABAP code from GitHub



Enter the Git clone URL
<https://github.com/hobru/ABAP-SDK-for-Azure>

and click on **Create Package**

Note: We are using here a fork of the official ABAP SDK for Azure which you can find here:

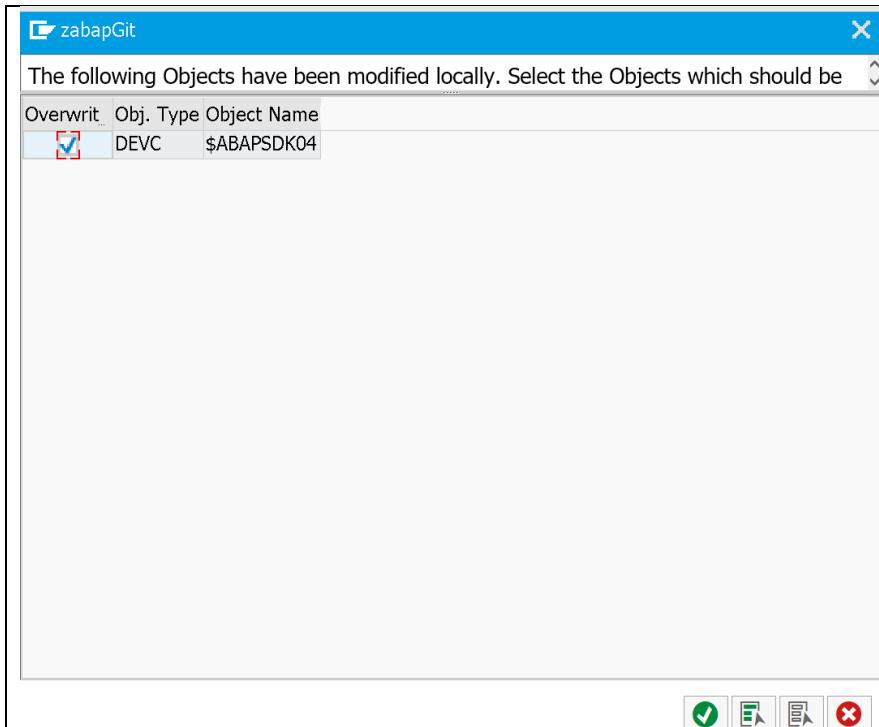
<https://github.com/Microsoft/ABAP-SDK-for-Azure>

The reason is that currently the ABAP SDK for Azure has dedicated security authorizations which currently require to also install the abapGit-Pluings extenion. This can be easily installed, once the developer edition from abapGit is installed. Installing and activating this new version takes additional time, which we skip in this Hackathon.

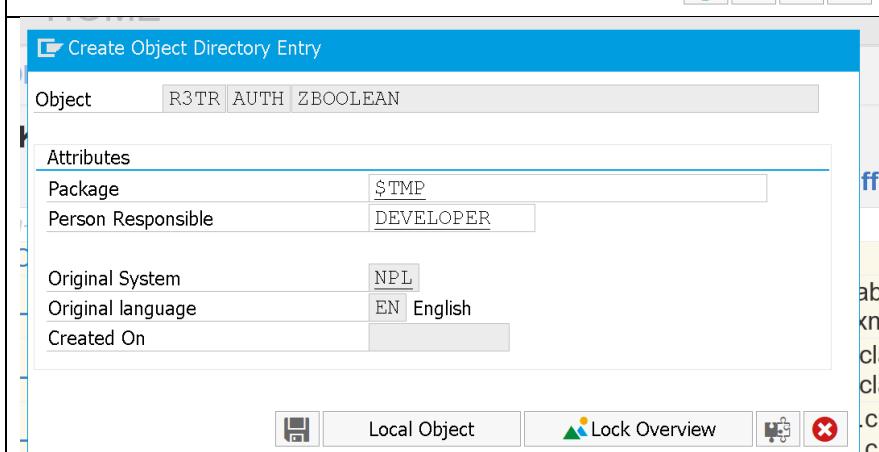
Officially you would do the following steps:

- Install abapGit as outlined before

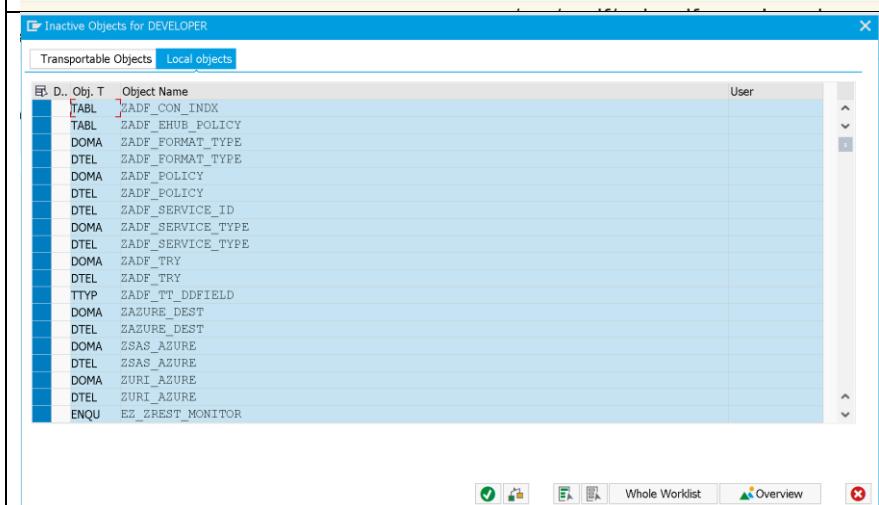
<ul style="list-style-type: none"> - Use abapGit to install the latest developer version of abapGit from https://github.com/larshp/abapGit - Use the new abapGit to install abapGit-Plugins from https://github.com/larshp/abapGit-Plugins - Use abapGit to install the ABAP SDK for Azure as outlined here, but from the official repository https://github.com/Microsoft/ABAP-SDK-for-Azure <p>For more information see https://github.com/Microsoft/ABAP-SDK-for-Azure/issues/16</p>	
	Enter the Package name \$ABAPSDK Short Description: ABAP SDK for Azure And Software Component: LOCAL Then click OK
	Back at the New online Project screen, click OK again
	The ABAP SDK for Azure is fetched. Note: This may take a few seconds to show this screen. Click on Pull to download all required files.



If you are prompted to Overwrite, select your Object Name and click on **OK**



When prompted to create Objects, click on **Local Object**



In the list of Inactive Objects click on **Continue**

Note: Activating and Compiling all artifacts will take a few minutes.

The screenshot shows two SAP GUI windows side-by-side.

Top Window: Inactive Objects for DEVELOPER - Transportable Objects tab. It lists various objects under 'D.. Obj. T' and 'Object Name'. Some objects have a red border around them, specifically LZADF_FGI00, LZADF_FGT00, LZADF_FGTOP, LZEHUBPOLICYF00, LZEHUBPOLICYI00, LZEHUBPOLICYT00, LZRESTF00, LZRESTI00, LZRESTT00, LZRESTTOP, LZSSF_FGF00, LZSSF_FGI00, LZSSF_FGT00, LZSSF_FGTOP, LZ_REGISTERF00, LZ_REGISTERI00, LZ_REGISTERT00, and LZ_REGISTERTOP.

Bottom Window: abapGit interface showing the ABAP-SDK-for-Azure repository. The sidebar shows 'non-code and meta files' and branches 'ZADF_FG' and 'ZEHUBPOLICY'. The main area shows a list of files under each branch, with 'view diff' links next to them. A status message at the bottom says 'Dynpro ZREST_SCREEN 0100 was activated'.

Click on **OK** to run the final check and activate all objects.

In the final step you should see ZREST_SCREEN 0100 was activated.

Now ABAP SDK for Azure is installed on your system.

Configure RFC Destination and ABAP SDK for Azure

The ABAP SDK for Azure uses a set of RFC destination for each Azure Service. This simplifies the management and tracing of ABAP calls to Azure.

In addition a set of customizing tables determine what scenarios from Azure are exposed to your SAP System and how they can be used.

Configuration of RFC Connections

Generate RFC Callback Positive Lists Activate Non-Empty Whitelists

RFC callback check not secure

RFC Connections

	Type	PL A...	Comment
ABAP Connections	3		
Internal Connections	I		
TCP/IP Connections	T		
Connections Using ABAP Driver	X		

In order for the ABAP SDK to connect to Azure an RFC destination is required.

Go to Transaction

/nSM59

And click on **Create**

RFC Destination

Connection Test Fast Serialization Test

RFC Destination: ABAPSDK-to-EventHub

Connection Type: G New Entry

Description:

Description 1
Description 2
Description 3

Administration Technical Settings Logon & Secur Unicode Special Options

Enter the **RFC Destination** as ABAPSDK-to-EventHub and **Connection Type G**

Then hit **Enter**

Information

i HTTP connections may not be secure

OK ?

Click on **OK** in the Information dialog.

RFC Destination

Connection Test Fast Serialization Test

RFC Destination: ABAPSDK-TO-EVENTHUB

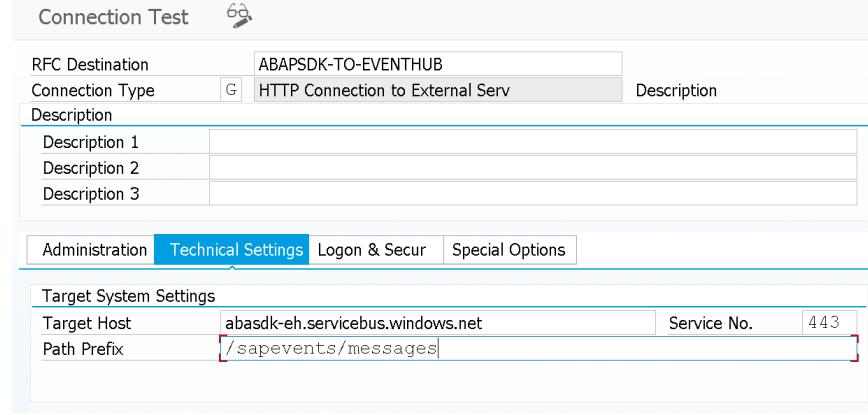
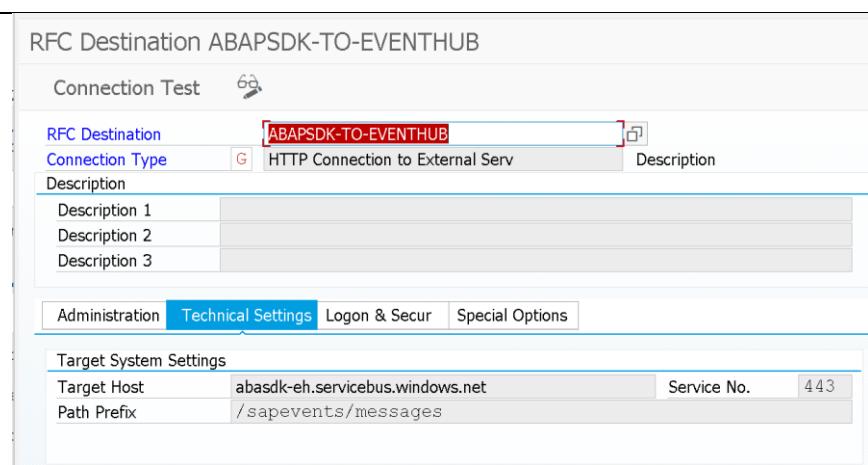
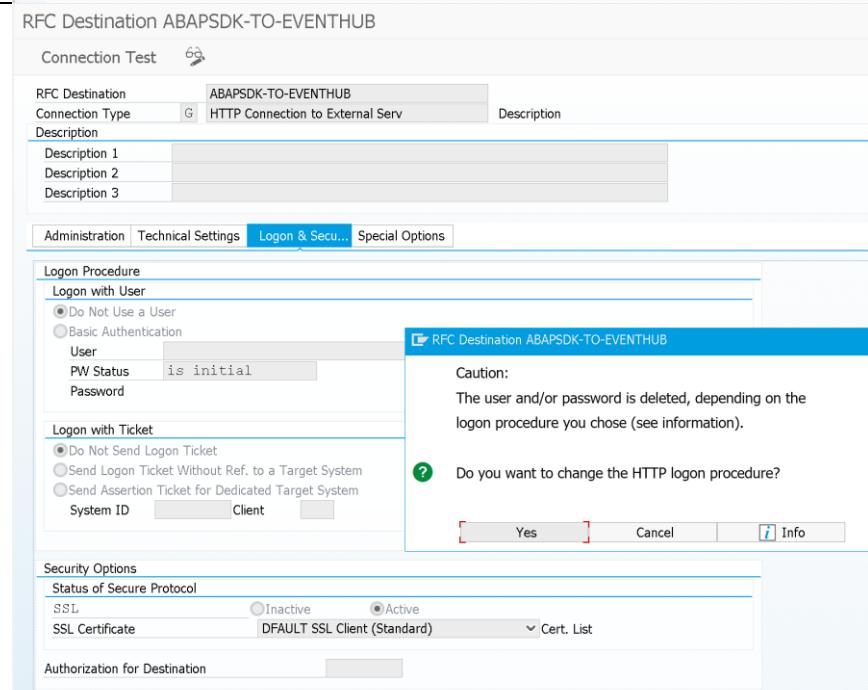
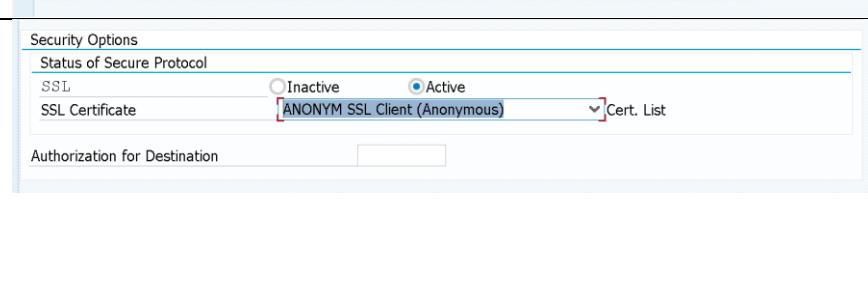
Connection Type: G New Entry

Description:

Description 1
Description 2
Description 3

Administration Technical Settings Logon & Secur Unicode Special Options

In the warning screen hit **enter** to continue

	<p>Enter the Target Host as full namespace URL that you wrote down in Notepad, e.g. abapsdk-eh.servicebus.windows.net</p> <p>The Port is 443</p> <p>And the Path Prefix is /<Event Hub Instance>/messages, e.g. /sapevents/messages</p>
	<p>Click on Logon & Secur</p> <p>Note: If you get a warning, just hit Enter</p>
	<p>On the Logon & Secur tab, Activate SSL</p> <p>When prompted click on Yes</p>
	<p>Since we imported the Azure Certificate in the Anonymous Store in STRUST, select ANONYM SSL Client (Anonymous) from the drop down for SSL Certificates</p>

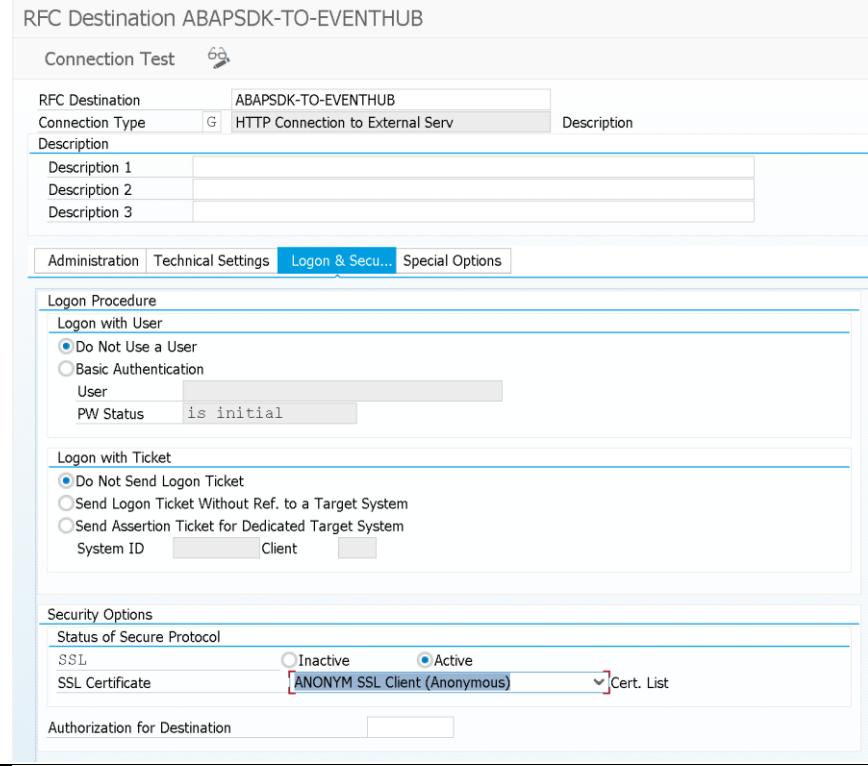
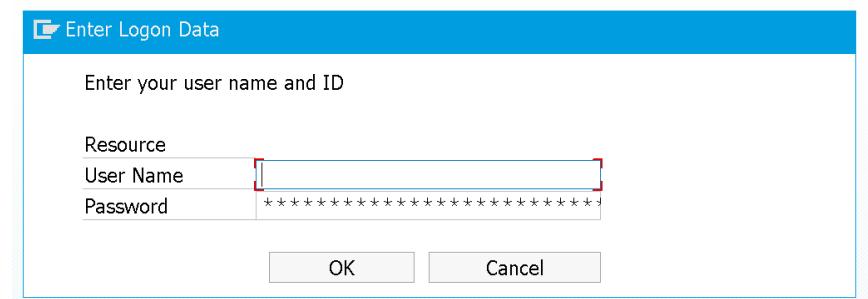
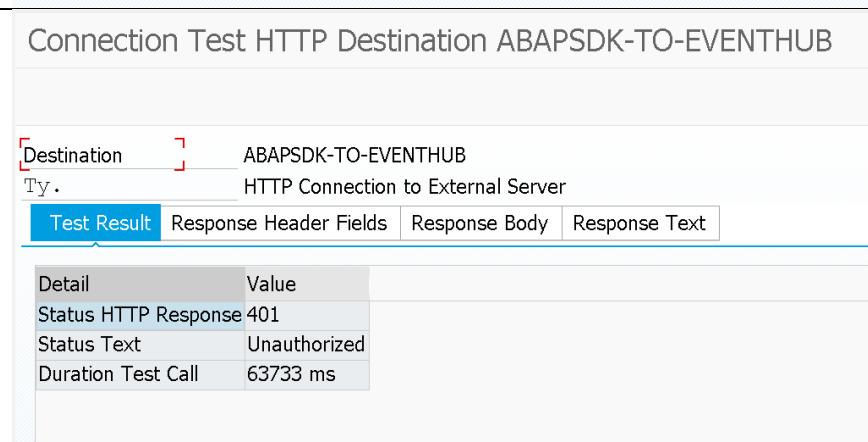
	<p>Click on Save and click on Connect Test to verify the URL and Security settings</p>								
	<p>In the Enter Logon Data dialog click on Cancel. Note: Authentication will be done using the Key we retrieved before.</p>								
 <table border="1" data-bbox="223 1522 557 1657"> <thead> <tr> <th>Detail</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Status HTTP Response</td> <td>401</td> </tr> <tr> <td>Status Text</td> <td>Unauthorized</td> </tr> <tr> <td>Duration Test Call</td> <td>63733 ms</td> </tr> </tbody> </table>	Detail	Value	Status HTTP Response	401	Status Text	Unauthorized	Duration Test Call	63733 ms	<p>As a result you should see something like this</p> <p>Note: HTTP Response 401 is perfectly fine right now. The test was just to make sure that the SSL configuration is correct.</p>
Detail	Value								
Status HTTP Response	401								
Status Text	Unauthorized								
Duration Test Call	63733 ms								

Table Edit Goto System Help

/nSM30

Edit Table Views: Initial Screen

H Find Maintenance Dialog

Table/View ZREST_CONFIG

Restrict Data Range

No Restrictions
 Enter conditions
 Variant

Display Maintain Transport

In the next step you need to configure the ABAP SDK. Go to transaction /nSM30, enter the **Table name** ZREST_CONFIG and click on **Maintain**

Table View Edit Goto Selection Utilities System Help

/nSM30

Change View "Configure Interface URI Destination": Overview

New Entries

Configure Interface URI Destination

Inter ID	RFC Destination

In the maintenance screen click on **New Entries**

Table View Edit Goto Selection Utilities System Help

/nSM30

New Entries: Details of Added Entries

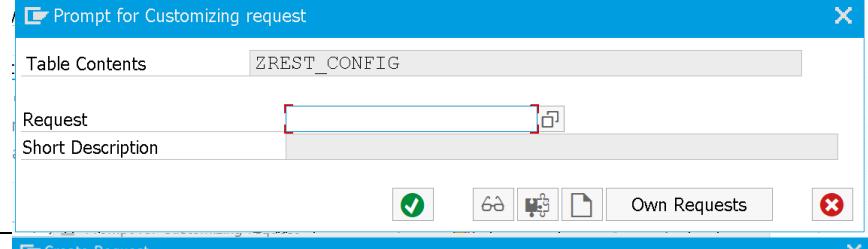
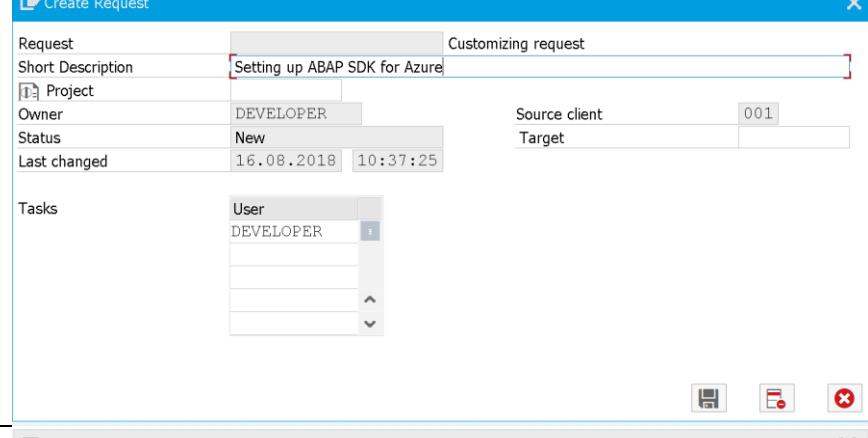
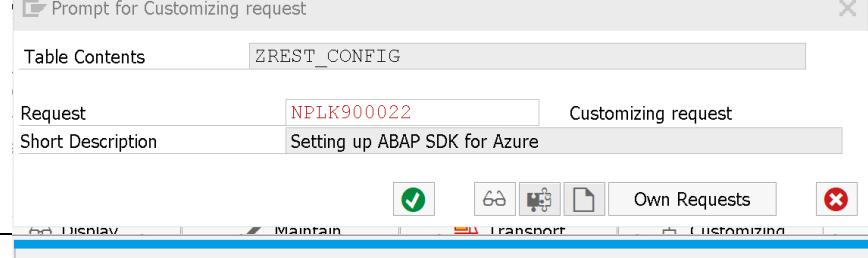
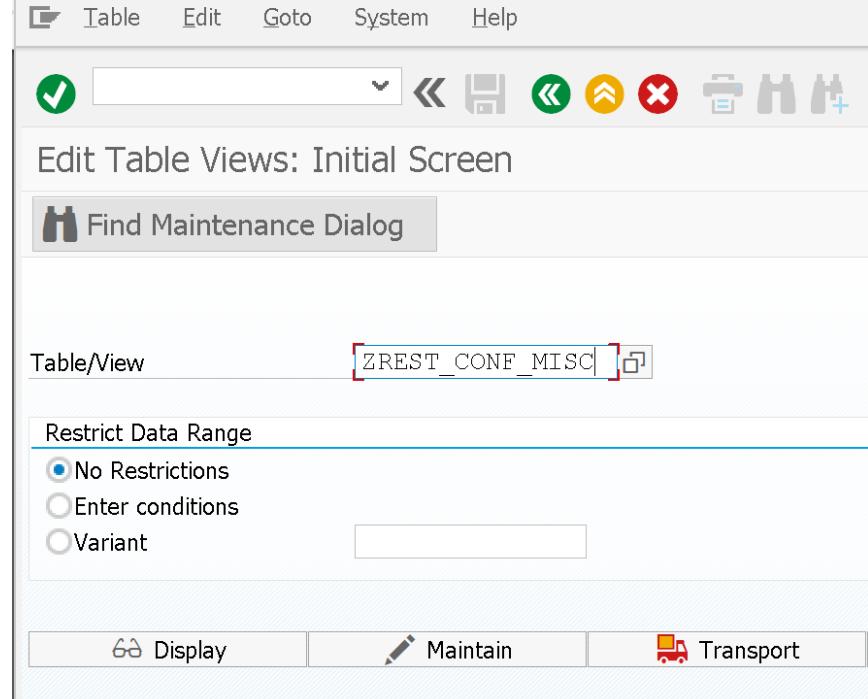
Inter ID HACK-EH

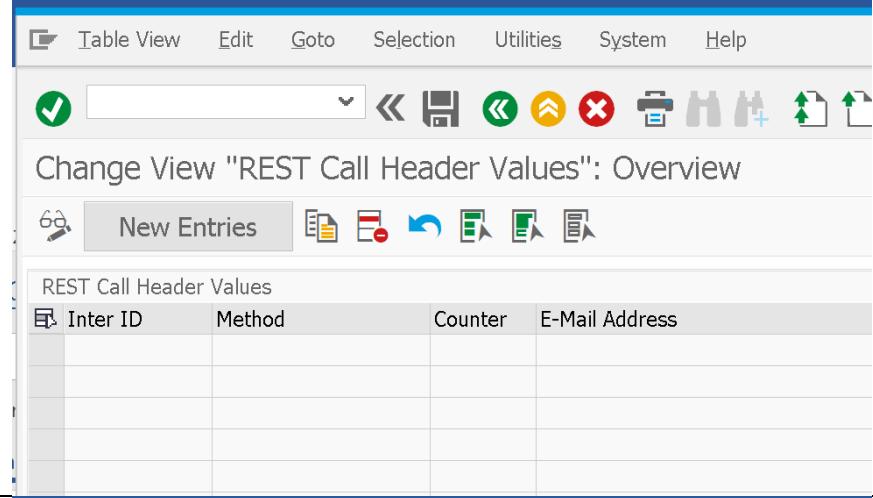
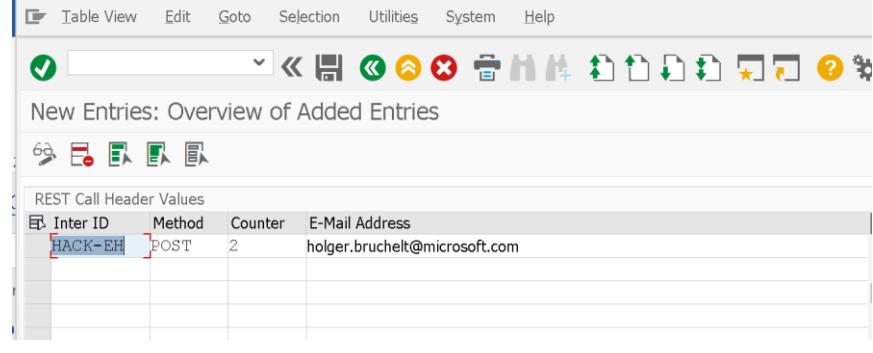
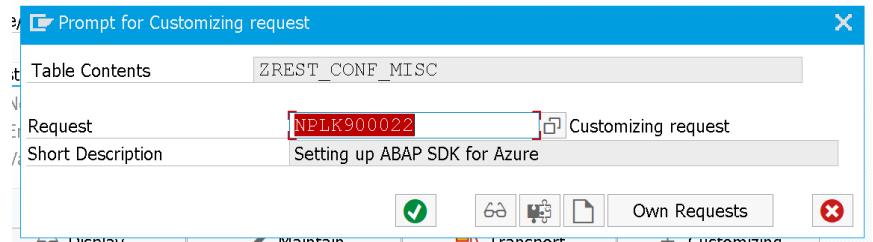
Configure Interface URI Destination

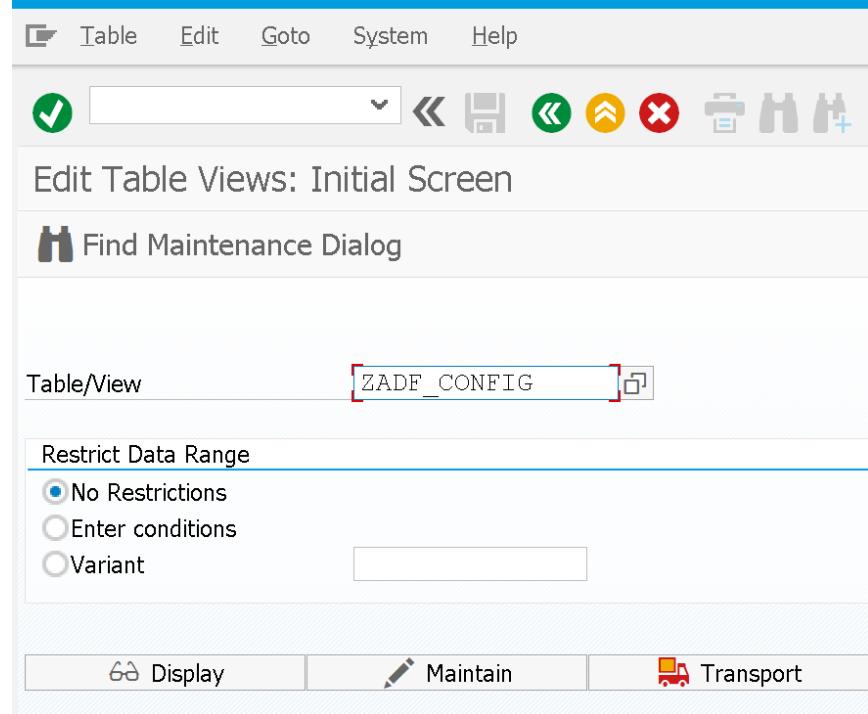
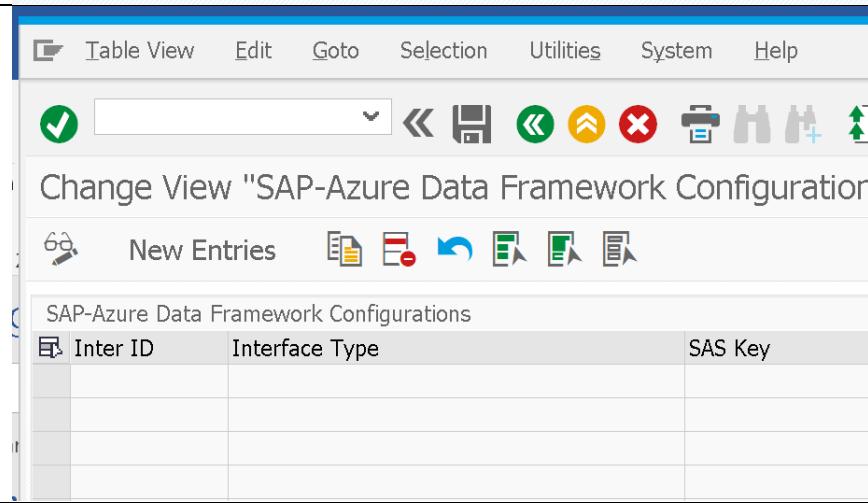
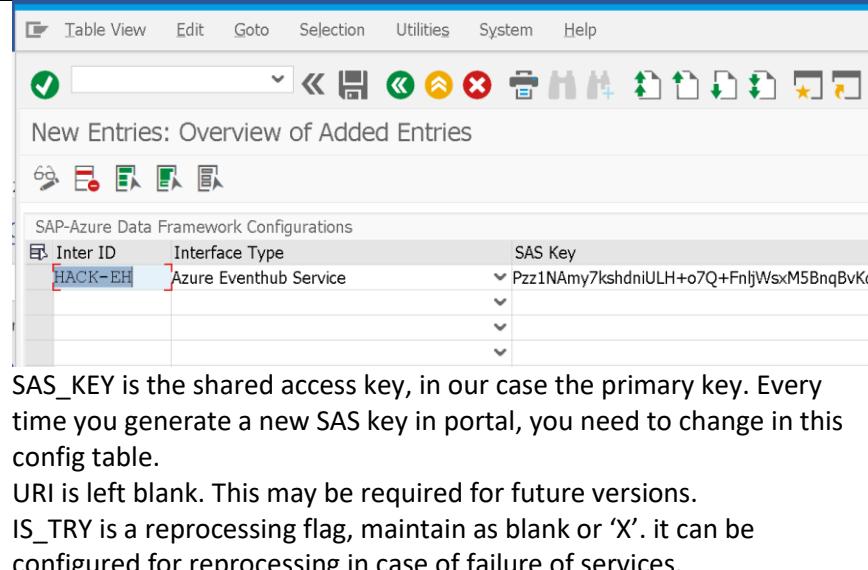
Destination ABAPSDK-TO-EVENTHUB

Enter an **Interface ID** HACK-EH and the name of the **RFC Destination** you just created, ABAPSDK-TO-EVENTHUB

Then click on **Save**

	<p>When prompted for Customizing Request, click on Create Request</p>
	<p>And enter a new Request by providing a short description, e.g. Setting up ABAP SDK for Azure Then click on Save</p>
	<p>Back in the Customizing Request screen Click on OK</p>
	<p>Once that is done go back to transaction /nSM30 and select table ZREST_CONF_MISC Click on Maintain</p>

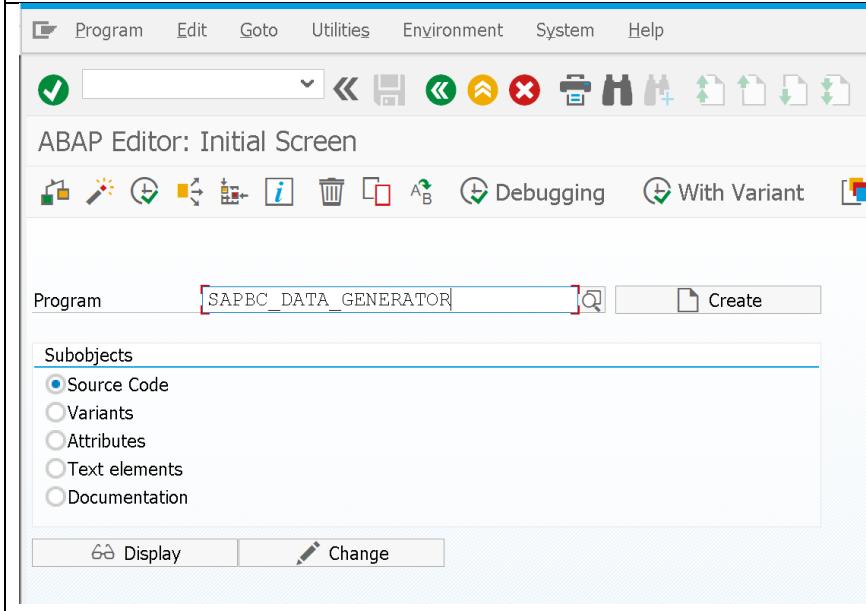
	<p>In the Maintenance screen click on New Entry</p>
	<p>Enter the Interface ID from before, e.g. HACK-EH Method: POST Counter: 2 Your Email: Text Name: An error occurred while sending a message to the event hub Retry Frequency: Regular Click on Save</p> <p>Note: You might not see the columns Text Name & Retry Frequency. Just use Tab to advance</p>
	For the customizing request just click on OK

	<p>Once the entries are saved, go back to transaction /nSM30 and enter the table name ZADF_CONFIG</p> <p>Click on Maintain</p>
	<p>In the Maintenance screen click on New Entries</p>
 <p>SAS_KEY is the shared access key, in our case the primary key. Every time you generate a new SAS key in portal, you need to change in this config table.</p> <p>URI is left blank. This may be required for future versions.</p> <p>IS_TRY is a reprocessing flag, maintain as blank or 'X'. it can be configured for reprocessing in case of failure of services.</p>	<p>Enter the Interface ID from before, e.g. HACK-EH</p> <p>Select the Interface Type Azure Event Hub Service</p> <p>Paste the Primary key from Notepad to SAS Key</p> <p>Leave Base URI blank</p> <p>Call Type: Synchronous Call</p> <p>Reprocess: Enable Reprocessing</p> <p>Click on Save</p>

	<p>Once the entries are saved, go back to transaction /nSM30 and enter the table name ZADF_EHUB_POLICY</p> <p>Click on Maintain</p>
	<p>In the Maintenance screen click on New Entries</p>
	<p>Enter the Interface ID from before, e.g. HACK-EH And the Policy RootManageSharedAccessKey</p> <p>Click on Save</p>

Create Demo Data to send to Azure

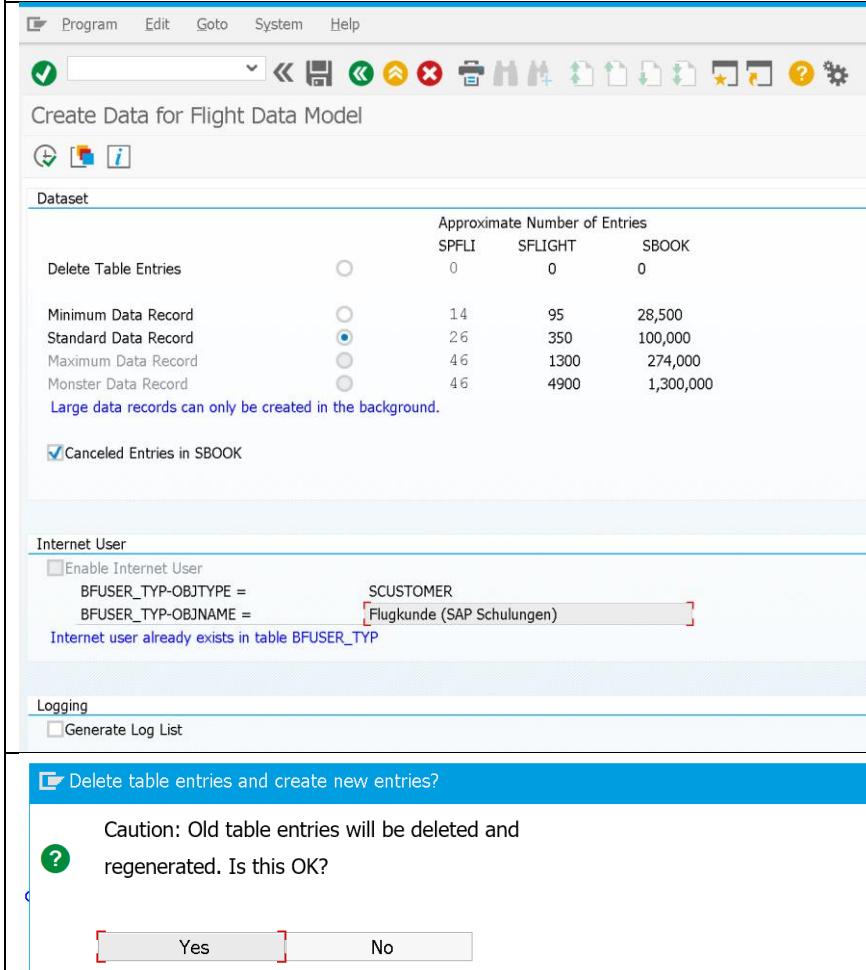
The SAP Flight Model (SFLIGHT) is probably the most known SAP Demo Data scenario in an SAP System and has been around for a long time. Reflecting an airline scenario, airlines, flight numbers, and other data is used to explain concepts of SAP.



Now the ABAP SDK is configured and you can send data from SAP to the Event Hub on Azure.

In this demo we will use the SLIGHT program.

Since this is a new system you need to generate SLIGHT information. Go to transaction /nSE38 and run the program SAPBC_DATA_GENERATOR By hitting F8



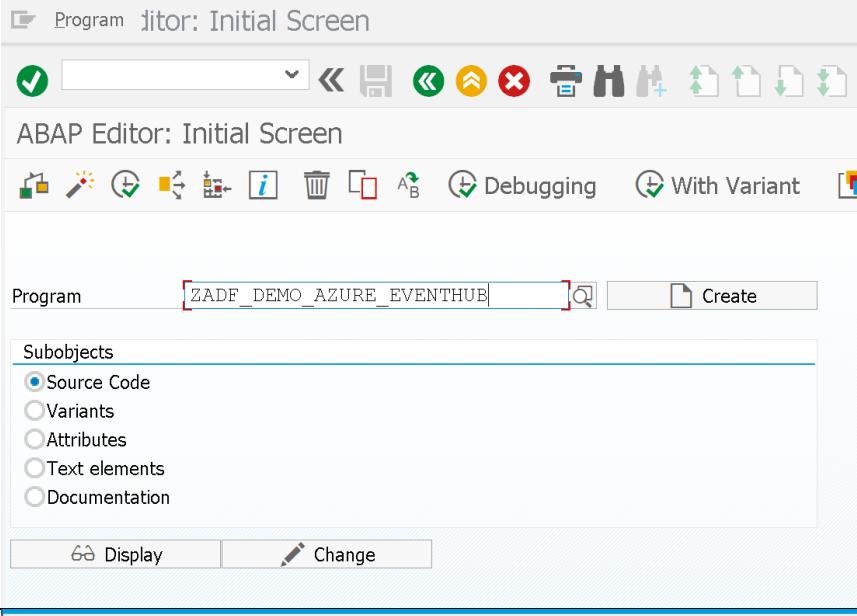
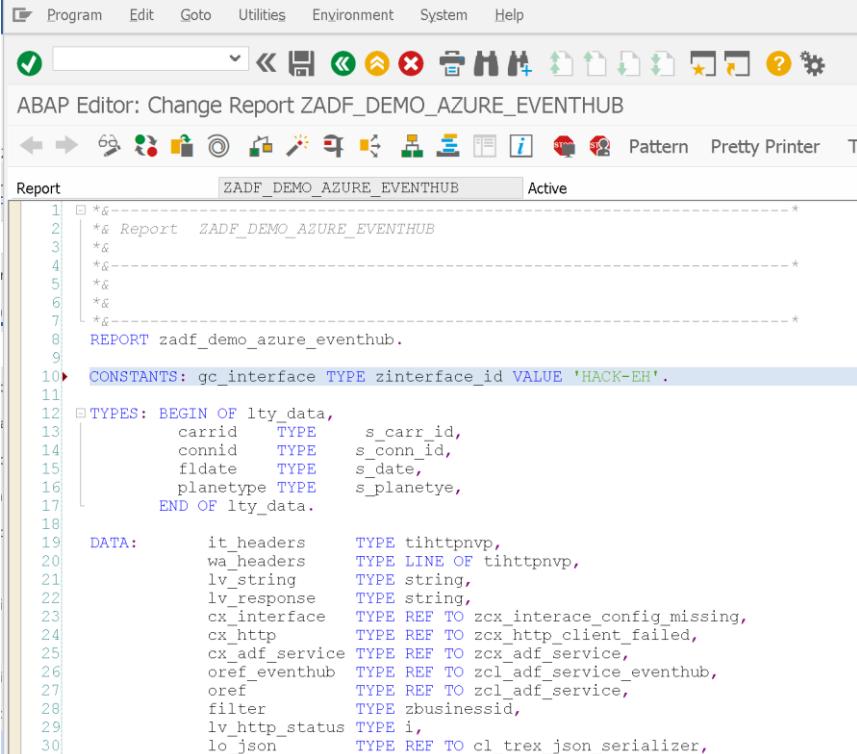
In the Create Data for Flight Data Model program click on Execute to run the program

When prompted to delete old tables, click on Yes

Send Message from SAP System

The ZADF_DEMO_AZURE_EVENTHUB program is a simple report that shows how easy it is to use the ABAP SDK for Azure to send data from SAP to the Azure Event Hub. Sample data from SLIGHT is sent to Azure.

The intention of this program is just to showcase one usecase and is certainly not intended for productive use!

 <p>Program Jitor: Initial Screen</p> <p>ABAP Editor: Initial Screen</p> <p>Program <input type="text" value="ZADF_DEMO_AZURE_EVENTHUB"/> Create</p> <p>Subobjects</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Source Code <input type="radio"/> Variants <input type="radio"/> Attributes <input type="radio"/> Text elements <input type="radio"/> Documentation <p>Display Change</p>	<p>In order to send data from SAP to the Event Hub on Azure you can run a demo program ZADF_DEMO_AZURE_EVENTHUB.</p> <p>Go to transaction /nSE38, enter the program name ZADF_DEMO_AZURE_EVENTHUB and click on Change</p>
 <p>ABAP Editor: Change Report ZADF_DEMO_AZURE_EVENTHUB</p> <pre> Report ZADF_DEMO_AZURE_EVENTHUB Active 1 *->--* 2 *& Report ZADF_DEMO_AZURE_EVENTHUB 3 *->--* 4 *&--* 5 *& 6 *& 7 *&--* 8 REPORT zadf_demo_azure_eventhub. 9 10 CONSTANTS: gc_interface TYPE zinterface_id VALUE 'HACK-EH'. 11 12 TYPES: BEGIN OF lty_data, 13 carrid TYPE s_carr_id, 14 connid TYPE s_conn_id, 15 fldate TYPE s_date, 16 planetype TYPE s_planetye, 17 END OF lty_data. 18 19 DATA: it_headers TYPE tihttpnpv, 20 wa_headers TYPE LINE OF tihttpnpv, 21 lv_string TYPE string, 22 lv_response TYPE string, 23 cx_interface TYPE REF TO zcx_interace_config_missing, 24 cx_http TYPE REF TO zcx_http_client_failed, 25 cx_adf_service TYPE REF TO zcx_adf_service, 26 oref_eventhub TYPE REF TO zcl_adf_service_eventhub, 27 oref TYPE REF TO zcl_adf_service, 28 filter TYPE zbusinessid, 29 lv_http_status TYPE i, 30 lo_json TYPE REF TO cl_trex_json_serializer, </pre>	<p>Change the value of DEMO_EHUB in line 10 to the name of the Event Hub Instance, e.g. HACK-EH</p>

```

Report          ZADF_DEMO_AZURE_EVENTHUB      Active
19  DATA:      it_headers      TYPE tihttpnvp,
20    wa_headers      TYPE LINE OF tihttpnvp,
21    lv_string       TYPE string,
22    lv_response     TYPE string,
23    cx_interface   TYPE REF TO zcx_interace_config_missing,
24    cx_http        TYPE REF TO zcx_http_client_failed,
25    cx_adf_service TYPE REF TO zcx_adf_service,
26    oref_eventhub   TYPE REF TO zcl_adf_service_eventhub,
27    oref            TYPE REF TO zcl_adf_service,
28    filter          TYPE zbusinessid,
29    lv_http_status  TYPE i,
30    lo_json         TYPE REF TO cl_trex_json_serializer,
31    lv1_string      TYPE string,
32    lv_xstring     TYPE xstring,
33    it_data         TYPE STANDARD TABLE OF lty_data.
34
35  *Sample data population for sending it to Azure eventhub
36  SELECT  carrid connid fldate planetype
37  FROM sflight UP TO 2 ROWS
38  INTO TABLE it_data.
39
40  IF sy-subrc EQ 0.

```

ABAP Editor: Change Report ZADF_DEMO_AZURE_EVENTHUB

Report ZADF_DEMO_AZURE_EVENTHUB Active

Information

SAP data sent to Azure EventHub

Home > ABAPSDK-EH
ABAPSDK-EH
Event Hubs Namespace

Overview

Access control (IAM)

Tags

Diagnose and solve problems

Events

SETTINGS

Shared access policies

Scale

Geo-Recovery

Locks

Automation script

ENTITIES

Event Hubs

MONITORING

+ Event Hub Delete

Connection Strings

Tags (change)
Click here to add tags

NAMESPACE CONTENTS 1 EVENT HUB PRICING TIER BASIC Show metrics data for the last 1 hour 6 hours 12 hours 1 day 7 days 30 days Click for additional metrics

Requests Messages Throughput

800B
700B
600B
500B
400B
300B
200B
100B
0B

12:15 PM 12:30 PM 12:45 PM 1 PM

INCOMING BYTES (...) ABAPSDK-EH 775 B OUTGOING BYTES (...) ABAPSDK-EH 0 B CAPTURED BYTES (...) ABAPSDK-EH 0 s

Scroll down to line 37 and change the number of ROWs from **10 to 2**

Then **save** and **activate** the program.

Note: For your demo it is good enough to send two entries to Azure.

Once the program is saved and activated, **run the program**.

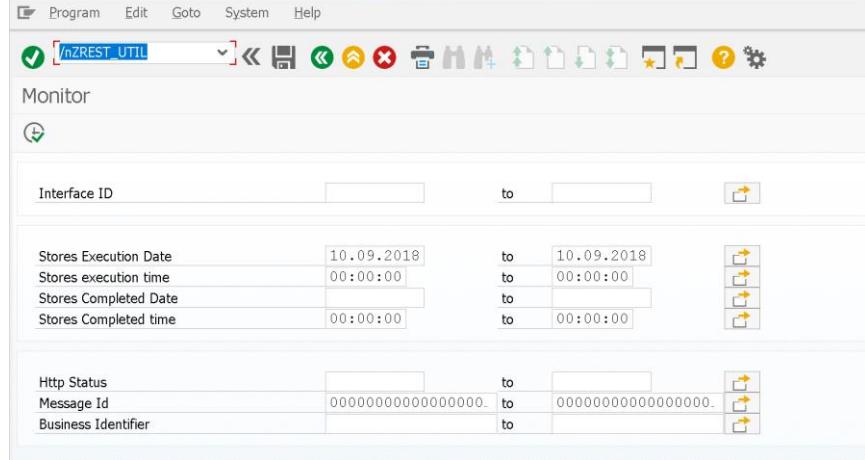
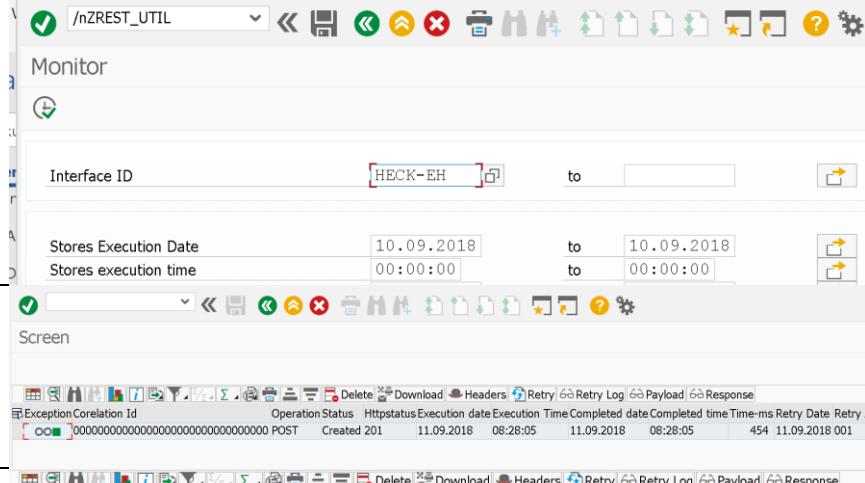
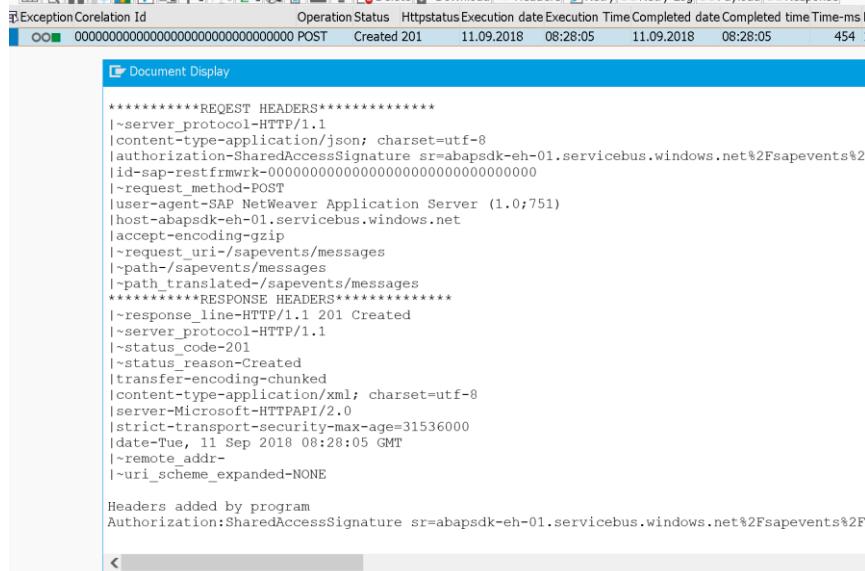
Note: Feel free to build on this example and create your very own implementation!

As a result you should get a message that SAP data was sent to Azure!

In the Azure Portal, in the Overview page of the Event Hub you should now see one message.

Monitoring in SAP System

You can also monitor and trace the calls that were done directly from the SAP System. The ABAP SDK Monitor (ZREST_UTIL) allows you to view the history of all the messages that were posted to Azure Services. This allows you to troubleshoot and re-process messages if required.

	<p>From the SAP GUI open Transaction ZREST_UTIL</p>
	<p>Enter the Interface ID HECK-EH And click on Execute (F8)</p>
	<p>You should see a list of Transactions</p>

Create Logic App to React on new Events

Azure Logic Apps simplifies how you build automated scalable workflows that integrate apps and data across cloud services and on-premises systems. Hundreds of preconfigured triggers and connectors are available that help react to events, mash-up information and send data to other systems.

More information about Logic Apps can be found at <https://azure.microsoft.com/de-de/services/logic-apps/>

The screenshot shows the Azure Portal interface. On the left, a sidebar lists various services: Create a resource, All services, Favorites (Dashboard, All resources, App Services, Resource groups, Virtual machines, Load balancers), and a New section. In the center, the 'ABAPSDK-EH - Event Hubs' blade is open under the 'Event Hubs Namespace' category. It includes sections for Overview, Access control (IAM), Tags, Diagnose and solve problems, Events, and Shared access policies. A search bar at the top right says 'Search (Ctrl+ /)'. On the right, a panel titled 'Event Hubs' shows a list of resources with one item named 'sapevents' selected. Below this, another search bar says 'Search this blade'. At the bottom, there's a 'NAME' column header and a 'Shared access policies' link. To the right of the main content area, two columns of text provide instructions: 'Now that the data is in Azure, you can work with this information. One easy way to build application or actions in Azure is Logic Apps.' and 'Go to the Azure Portal and click on + Create a resource'. The bottom section shows a 'Search for Logic App' input field containing 'Logic App', a list of results including 'Logic App', 'Logic Apps B2B', 'Logic Apps Custom Connector', and 'Logic Apps Management (Preview)', and a table of results with columns for NAME, PUBLISHER, and CATEGORY. The first result, 'Logic App', is highlighted with a dashed border.

Now that the data is in Azure, you can work with this information. One easy way to build application or actions in Azure is Logic Apps.

Go to the Azure Portal and click on **+ Create a resource**

Search for Logic App

And select the **Logic App**

NAME	PUBLISHER	CATEGORY
Logic App	Microsoft	Web
Logic Apps B2B	Microsoft	Management Tools

Logic App

Microsoft

Logic Apps allow developers to design workflows that articulate intent via a trigger and series of steps, each invoking an App Service API app whilst securely taking care of authentication and best practices like durable execution.

Easy to use design tools - Logic Apps can be designed end-to-end in the browser. Start with a trigger - from a simple schedule to whenever a tweet appears about your company. Then orchestrate any number of actions using the rich gallery of connectors.

Compose SaaS easily - Even composition tasks that are easy to describe are difficult to implement in code. Logic Apps make it a cinch to connect disparate systems. Want to create a task in CRM based on activity on your Facebook or Twitter accounts? Want to connect your cloud marketing solution to your on-premises billing system? Logic apps are the fastest, most reliable way to deliver solutions to these problems.

Extensibility baked in - Don't see the connector you need? Logic Apps are part of the App Service suite and designed to work with API apps; you can easily create your own API app to use as a connector. Build a new app just for you, or share and monetize in the marketplace.

Real integration horsepower - Start easy and grow as you need. Logic Apps can easily leverage the power of BizTalk, Microsoft's industry leading integration solution to enable integration professionals to build the solutions they need.

[Save for later](#)

[Create](#)

Click on **Create**

Home > New > Marketplace > Everything > Logic App

Create logic app

Logic App

* Name
LogicAppForABAPSDK

* Subscription
Microsoft Azure - Hackathon

* Resource group ⓘ
 Create new Use existing
ABAPSDK-EH-RG

Location
West Europe

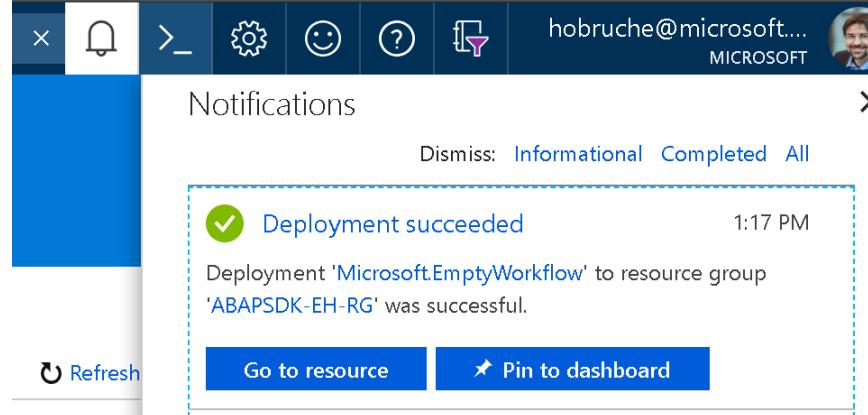
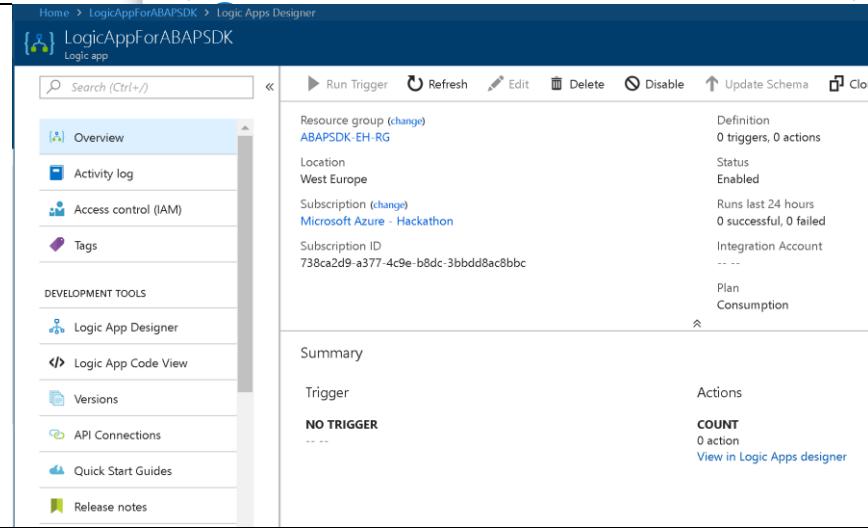
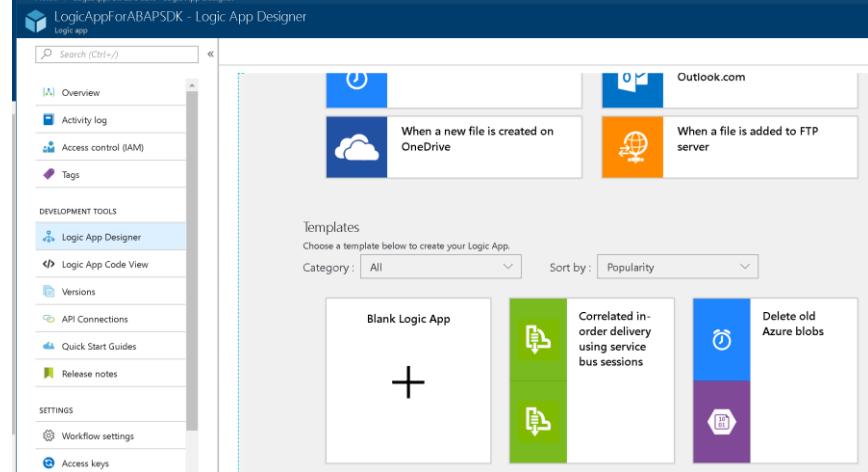
Log Analytics ⓘ
On

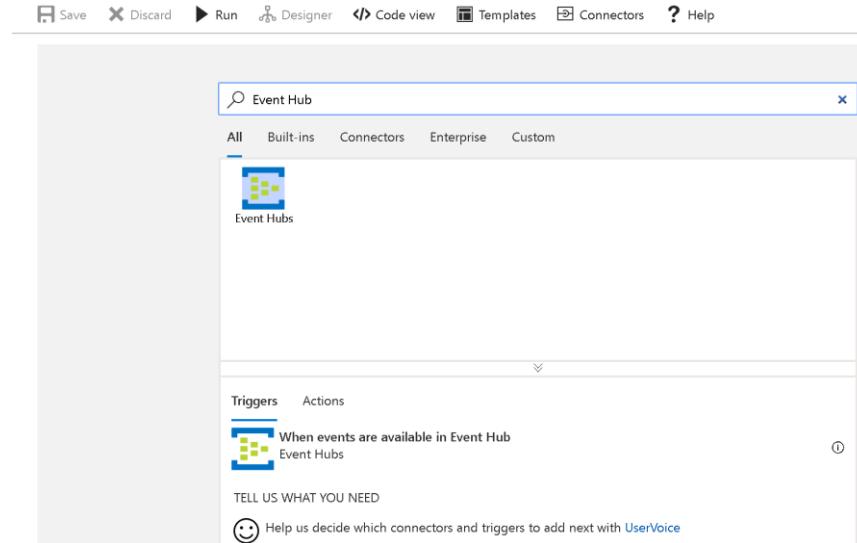
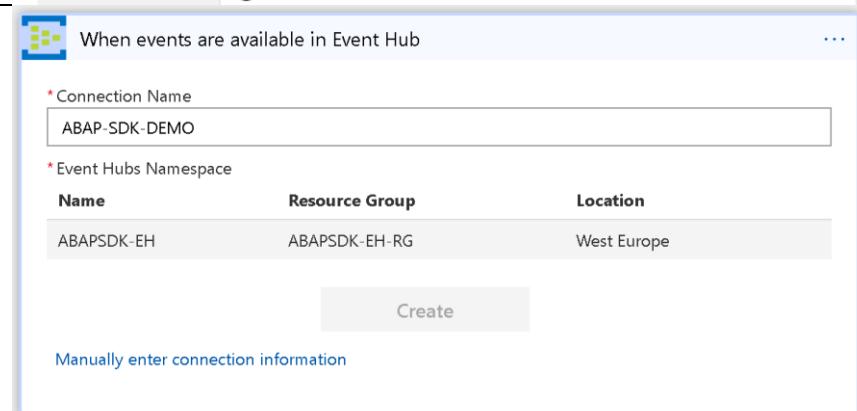
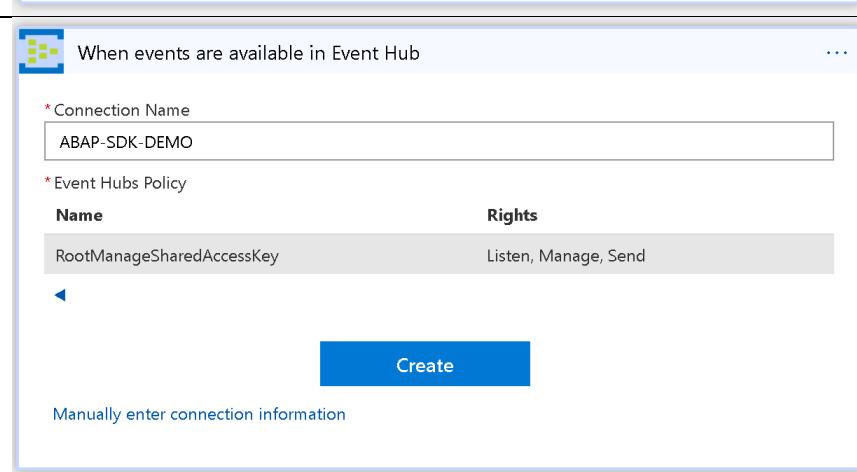
 You can add triggers and actions to your Logic App after creation.

Enter a Name, e.g. LogicAppForABAPSDK And select the **existing Resource Group** ABAPSDK-EH-RG which you created before.

Make sure for **Location** West Europe is selected. Click on **Create**

Note: Typically, you would probably create another resource group. In order to clean-up your subscription later on more easily we put everything in this one resource group.

 <p>The screenshot shows the Azure Notifications window. At the top, there are icons for close, notifications, settings, and help, followed by the email address 'hobruche@microsoft...' and the Microsoft logo. Below the header, the word 'Notifications' is displayed. A message box is shown with a green checkmark icon and the text 'Deployment succeeded' at 1:17 PM. The message continues: 'Deployment 'Microsoft.EmptyWorkflow' to resource group 'ABAPSDK-EH-RG' was successful.' At the bottom of the message box are two buttons: 'Go to resource' and 'Pin to dashboard'.</p>	<p>Once the deployment is finished, click on Go to Resource</p> <p>Note: If the Notification window is already closed, click on the Bell-Symbol to open it again.</p>
 <p>The screenshot shows the Logic Apps Designer Overview page for a logic app named 'LogicAppForABAPSDK'. The left sidebar includes links for Overview, Activity log, Access control (IAM), Tags, Development Tools (Logic App Designer, Logic App Code View, Versions, API Connections, Quick Start Guides, Release notes), and Settings (Workflow settings, Access keys). The main area displays the logic app's details: Resource group (ABAPSDK-EH-RG), Location (West Europe), Subscription (Microsoft Azure - Hackathon), and Subscription ID (738ca2d9-a377-4c9e-b8dc-3bbdd8ac8bbc). It also shows the Summary, Trigger (NO TRIGGER), and Actions (COUNT) sections.</p>	<p>In Logic Apps (you might need to scroll to the left) click on Logic App Designer</p>
 <p>The screenshot shows the Logic App Designer page. The left sidebar is identical to the previous screenshot. The main area features a 'Templates' section with a search bar and sorting options (Category: All, Sort by: Popularity). It lists three templates: 'Blank Logic App' (with a plus sign icon), 'Correlated in-order delivery using service bus sessions' (green icon), and 'Delete old Azure blobs' (purple icon).</p>	<p>Scroll down and click on Blank Logic App</p>

	<p>Search for Event Hub And select “When events are available in Event Hub”</p>
	<p>Enter a Connection Name: ABAP-SDK-DEMO and click on the ABAPSDK-EH</p>
	<p>Click on the RootManageSharedAccessKey And then on Create</p>

	<p>Click on Name of the Event Hub and ...</p>
	<p>select the sapevents Event Hub</p>
	<p>Click on + New Step</p>

<p>The content from SAP available in Logic Apps is Base64 Encoded.</p>	<p>So first it has to be decoded. Search for Compose and select Compose – Data Operations</p>
<p>Click on Inputs Switch to Expressions and enter base64ToString(triggerBody()?['ContentData'])</p>	<p>Then click on OK</p>
<p>Click on New Step</p>	

	<p>Search for Json and select Parse JSON – Data Operations</p>
	<p>Click on the Content line and select Compose - Output from the right hand side</p> <p>Then click on “Use sample payload to generate schema”</p>
	<p>Paste the sample payload</p> <pre>[{"carrid": "AA", "connid": "0017", "fldate": "20180402", "planetype": "747-400"}, {"carrid": "AA", "connid": "0017", "fldate": "20180402", "planetype": "747-400"}]</pre> <p>And click on Done</p>

The screenshot shows a Microsoft Flow editor interface. At the top, there's a 'Compose' step with an input action 'base64ToString...'. Below it is a 'Parse JSON' step. The 'Content' section of the Parse JSON step has an 'Output' field. The 'Schema' section displays a JSON schema:

```
{
  "type": "array",
  "items": {
    "type": "object",
    "properties": {
      "carrid": {
        "type": "string"
      },
      "connid": {
        "type": "string"
      }
    }
  }
}
```

At the bottom of the schema editor, there's a button 'Use sample payload to generate schema'.

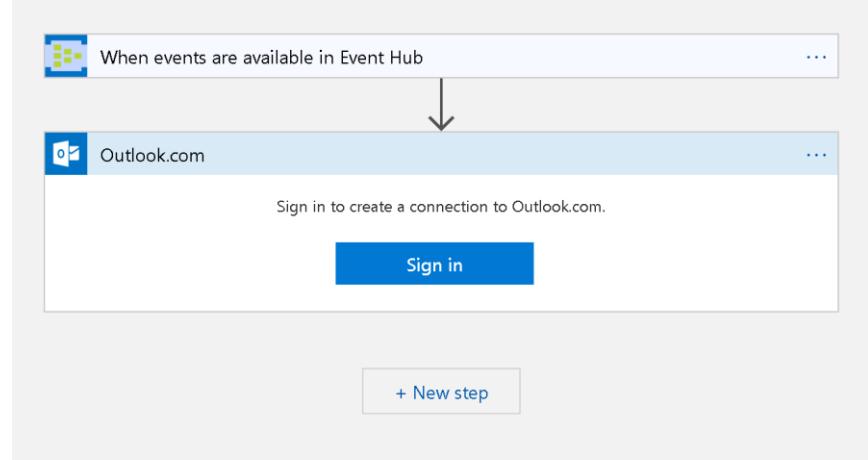
Click on + Next Step

The screenshot shows a Microsoft Flow editor interface. A trigger 'When events are available in Event Hub' is connected to an 'Outlook.com' action. The 'Choose an action' dialog is open, showing the 'Outlook.com' connector. Under the 'Actions' tab, five actions are listed:

- Reply to email (V2) (preview)
- Respond to an event invite (preview)
- Send an email
- Send approval email
- Send email with options

Search for Outlook.com and select Send an email – Outlook.com

Note: You will need to scroll down quite a bit.

 <p>When events are available in Event Hub</p> <p>Outlook.com</p> <p>Sign in to create a connection to Outlook.com.</p> <p>Sign in</p> <p>+ New step</p>	<p>Click on Sign In</p>
<p>https://login.microsoftonline.com/common/oauth2/v2.0/authorize?cli...</p> <p> Microsoft</p> <h2>Sign in</h2> <p>Email, phone, or Skype</p> <p>No account? Create one!</p> <p>Can't access your account?</p> <p>Next</p> <p>dsagtt19-a@outlook.com has previously signed into this device. Use this account instead. X</p> <p>©2019 Microsoft Terms of use Privacy & cookies ...</p>	<p>Sign in with your Outlook user (or select the previously signed in user) and click on Next</p>



abapsdkhackathon@outlook.com

Kennwort eingeben

.....

Angemeldet bleiben

[Ich habe mein Kennwort vergessen.](#)

[Melden Sie sich mit einem anderen Microsoft-Konto an.](#)

Anmelden

Enter your password
and click on **Log On**

abapsdkhackathon@outlook.com

Allow Logic App to use
your Outlook account
and click on **Yes**

Dieser App den Zugriff auf Ihre Infos erlauben?

logic-apis-westeurope.consent.azure-
apim.net

**Azure Logic Apps (West Europe) benötigt Ihre
Zustimmung für:**



Lese- und Schreibzugriff auf Ihre E-Mails

Azure Logic Apps (West Europe) kann E-Mails in
Ihrem Postfach lesen, aktualisieren, erstellen und
löschen. Eine Berechtigung zum Senden von E-
Mails ist nicht enthalten.



Senden von E-Mails in Ihrem Namen

Azure Logic Apps (West Europe) kann E-Mails in
Ihrem Namen senden.



Vollzugriff auf Ihre Kontakte

Azure Logic Apps (West Europe) kann Kontakte
in Ihren Kontaktordnern lesen, aktualisieren,
erstellen und löschen.



Vollzugriff auf Ihre Kalender

Azure Logic Apps (West Europe) kann Ereignisse
in Ihren Kalendern lesen, aktualisieren, erstellen
und löschen.



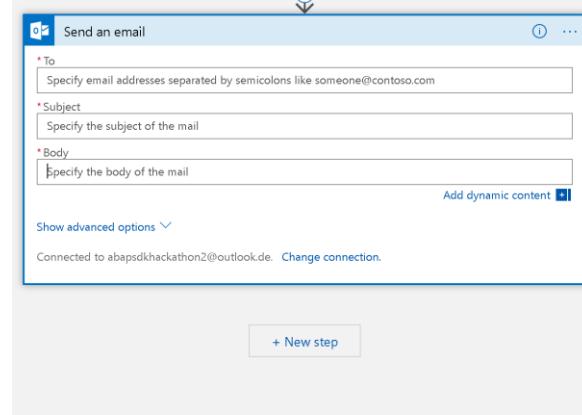
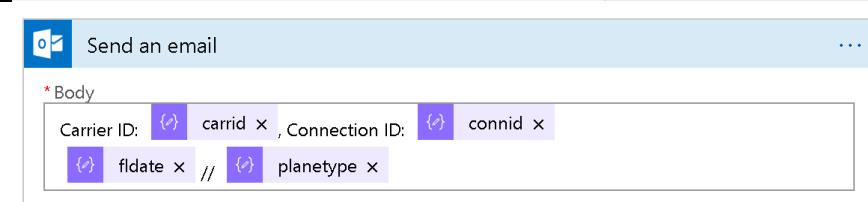
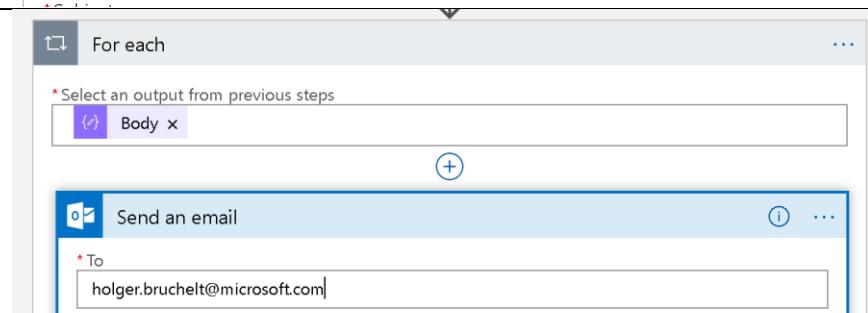
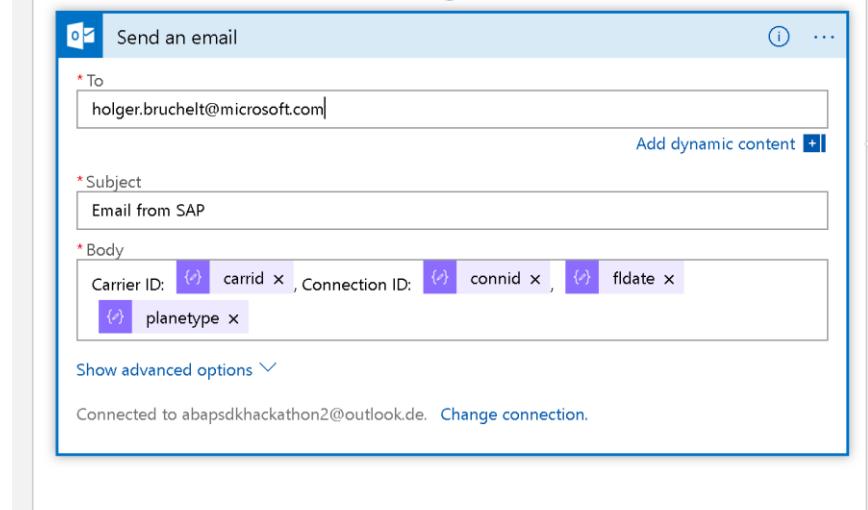
Auf Ihre Informationen immer zugreifen

Azure Logic Apps (West Europe) kann Ihre Infos
anzeigen und aktualisieren, auch wenn Sie diese
App nicht verwenden.

Durch Akzeptieren dieser Berechtigungen erlauben Sie dieser App, Ihre
Daten gemäß den [Vertragsbedingungen](#) und den
[Datenschutzbestimmungen](#) zu verwenden. Unter
<https://microsoft.com/consent> können Sie diese Berechtigungen ändern.
[Details anzeigen](#)

Nein

Ja

 <p>To: Specify email addresses separated by semicolons like someone@contoso.com</p> <p>Subject: Specify the subject of the mail</p> <p>Body: Specify the body of the mail</p> <p>Show advanced options ▾ Connected to abapsdkhackathon2@outlook.de. Change connection.</p> <p>+ New step</p>	<p>Add dynamic content from the apps and connectors used in this flow.</p> <p>Dynamic content Expression</p> <p>Search dynamic content</p> <p>Parse JSON</p> <ul style="list-style-type: none"> {carrid} {connid} {fldate} {planetype} 	<p>Click on the Body line and select carrid on the right hand side</p>
 <p>* Body</p> <p>Carrier ID: {carrid} , Connection ID: {connid} , {fldate} // {planetype}</p>		<p>Optional: feel free to add other fields and also text</p>
 <p>For each</p> <p>Select an output from previous steps</p> <p>{Body}</p> <p>+ Add an action</p>	<p>Since the schema contains an array a For each loop is added.</p> <p>Now add a Subject Line: Email from SAP And a recipient in the To field: <your Email address></p>	
 <p>To: holger.bruchelt@microsoft.com</p> <p>Subject: Email from SAP</p> <p>Body: Carrier ID: {carrid} , Connection ID: {connid} , {fldate} // {planetype}</p> <p>Show advanced options ▾ Connected to abapsdkhackathon2@outlook.de. Change connection.</p>		

The Logic App Designer interface shows a workflow starting with a 'For each' loop. Inside the loop, there is a 'Send an email' action. The 'Body' field of this action contains the dynamic content 'carrid'. The 'To' field is set to 'Holger.bruchelt@microsoft.com'. The 'Save' button is highlighted at the top left.

Click on **Save** to save the Logic App

The Logic App Designer interface shows the same workflow as the previous screenshot, but with the 'Save' button highlighted at the top left, indicating it has been clicked.

Once Saved, click on **Run**

Now the Logic App is running and waiting for events from SAP.

```

1  *&-
2  *& Report  ZADF_DEMO_AZURE_EVENTHUB
3  *&
4  *&
5  *&
6  *&
7  *&-
8  REPORT zadf_demo_azure_eventhub.
9
10 CONSTANTS: gc_interface TYPE zinterface_id VALUE 'HACK-EN'.
11
12 TYPES: BEGIN OF lty_data,
13          carrid    TYPE     s_carr_id,
14          connid    TYPE     s_conn_id,
15          f1date    TYPE     s_date.

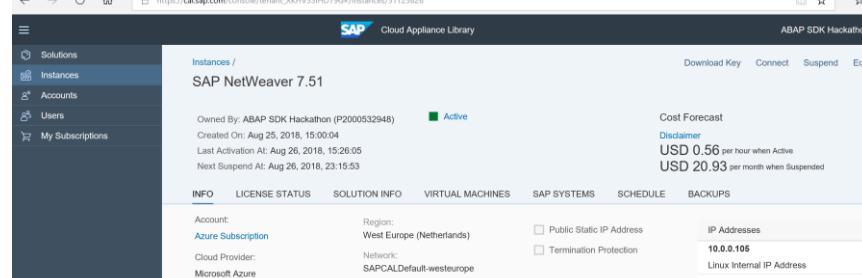
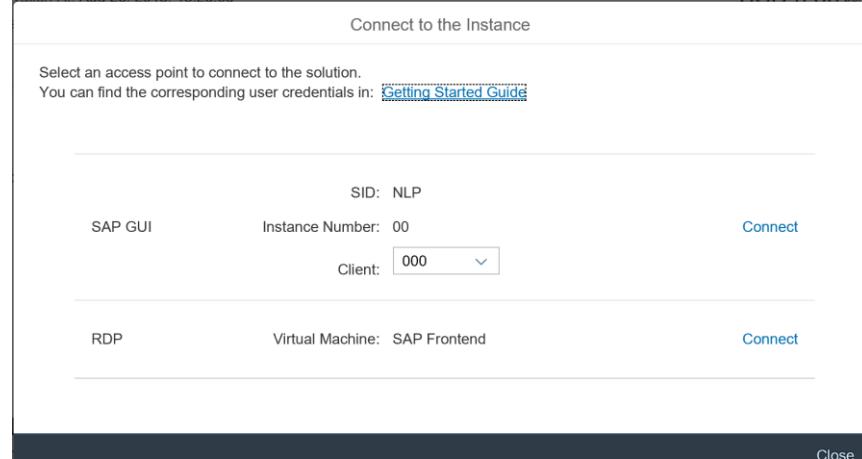
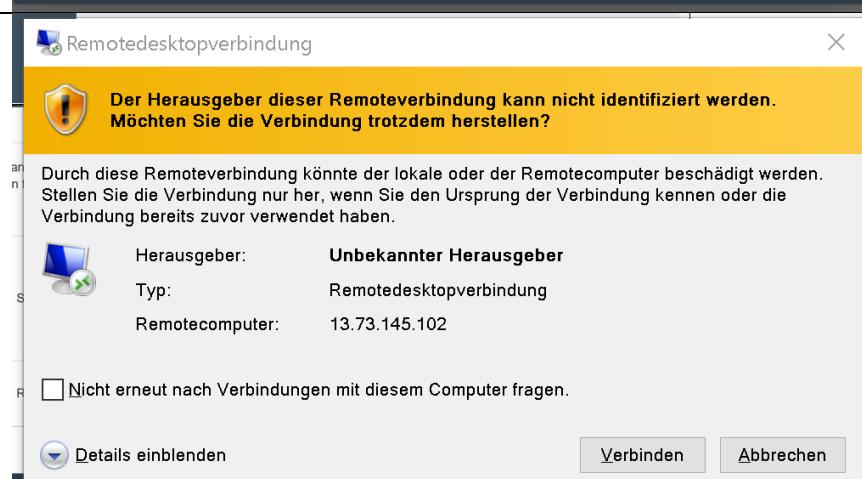
```

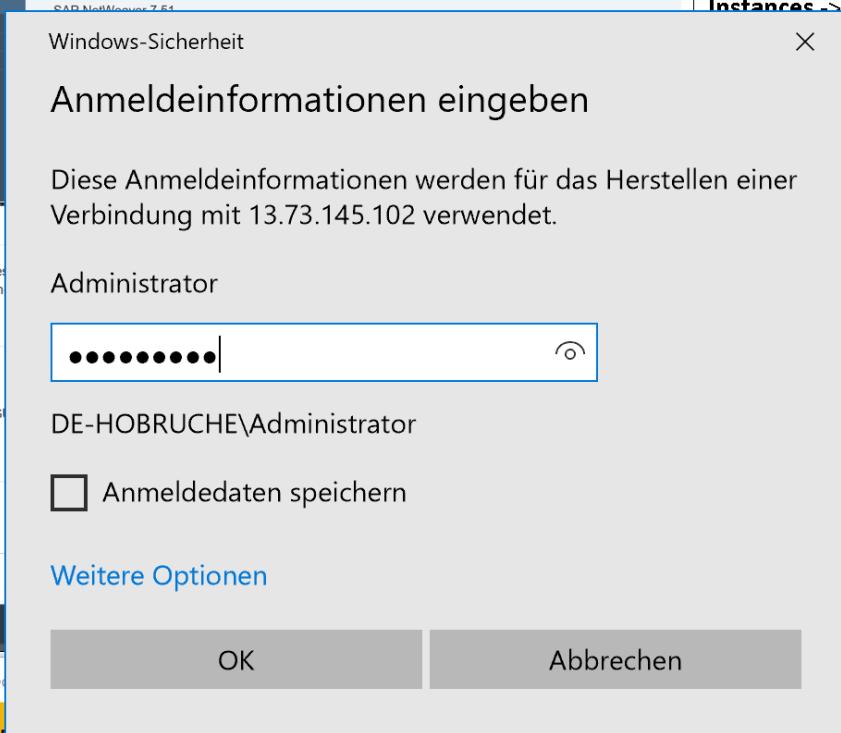
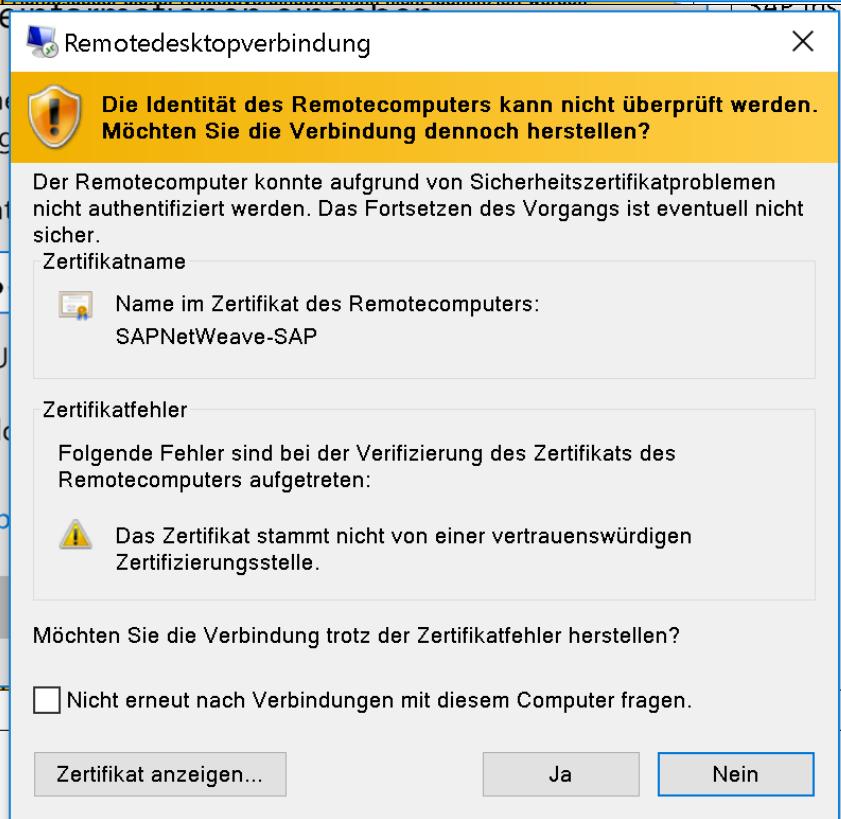
Do 16.08.2018 17:15
Holger Bruchelt
Email from SAP
An Holger Bruchelt
Diese Nachricht wurde mit der Priorität "Niedrig" gesendet.
Carrier ID: AA, Connection ID: 0017
20180301 // 747-400

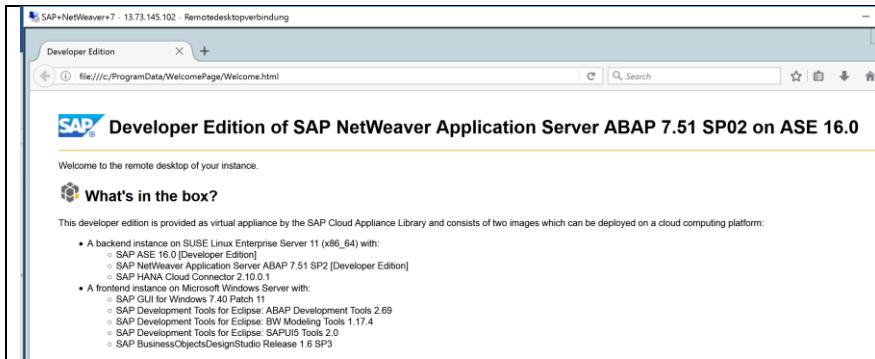
Now whenever you run the sample program on the SAP system and send a message to Azure, you should receive an email that a new message just arrived.

Optional: Connect to the Front End System

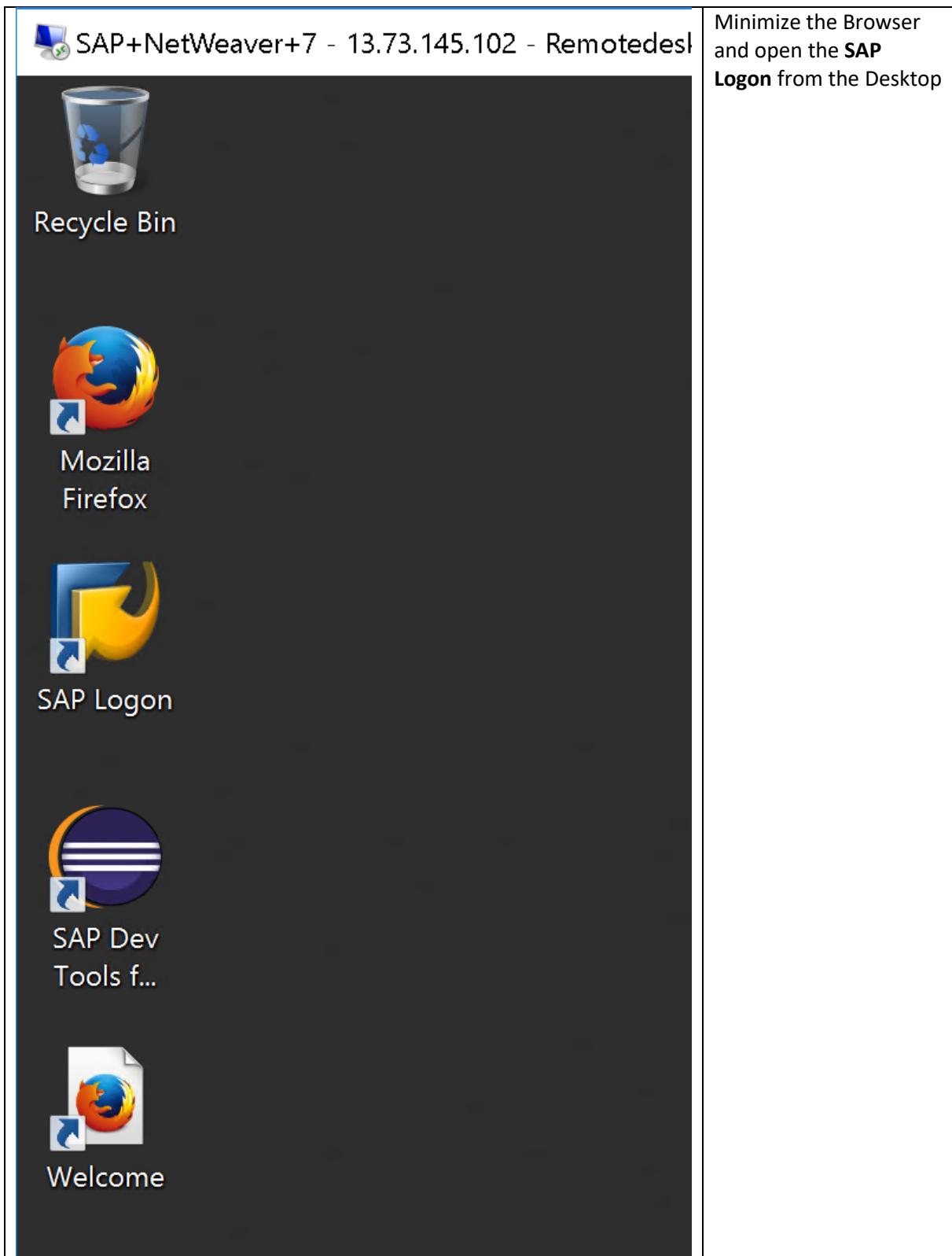
If you do not have an SAP GUI Installed on your laptop, please follow the steps outlined at the end of the document to connect via Remote Desktop to a Front-End System.

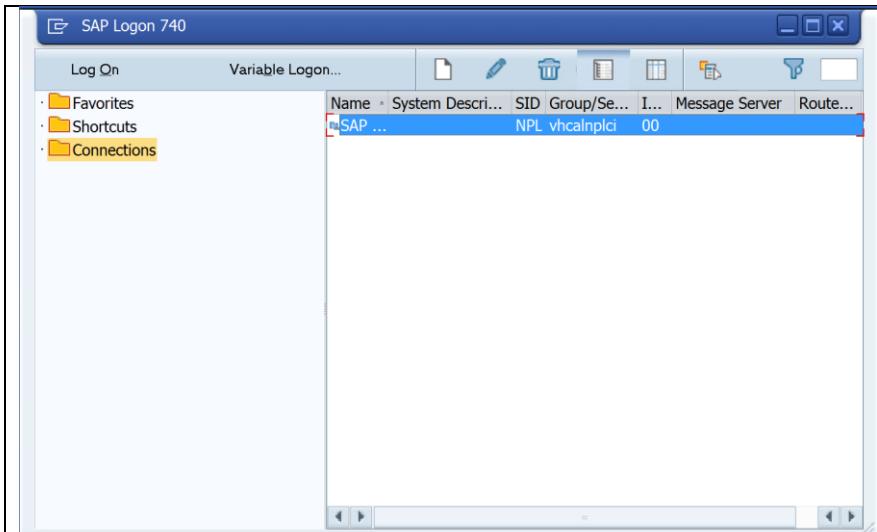
	<p>In the SAP Cloud Appliance Library under Instances -> SAP NetWeaver 7.51 click on Connect</p>
	<p>Click on Connect for the RDP (Remote Desktop Provider) section and open the File</p>
	<p>Click on Connect to connect to the Server</p>

 <p>SAP Logon Dialog showing Anmeldeinformationen eingeben (Enter login information) and Windows-Sicherheit (Windows Security). A password is entered in the password field.</p>	Enter your Password which you used for the SAP Instance and click on OK
 <p>Remote desktop connection dialog showing a certificate warning: Die Identität des Remotecomputers kann nicht überprüft werden. Möchten Sie die Verbindung dennoch herstellen? (The identity of the remote computer cannot be verified. Do you want to establish the connection anyway?). It also shows a certificate name: SAPNetWeave-SAP and a certificate error message: Das Zertifikat stammt nicht von einer vertrauenswürdigen Zertifizierungsstelle. (The certificate does not come from a trusted certification authority).</p>	Click on Yes to connect to the Remote Server

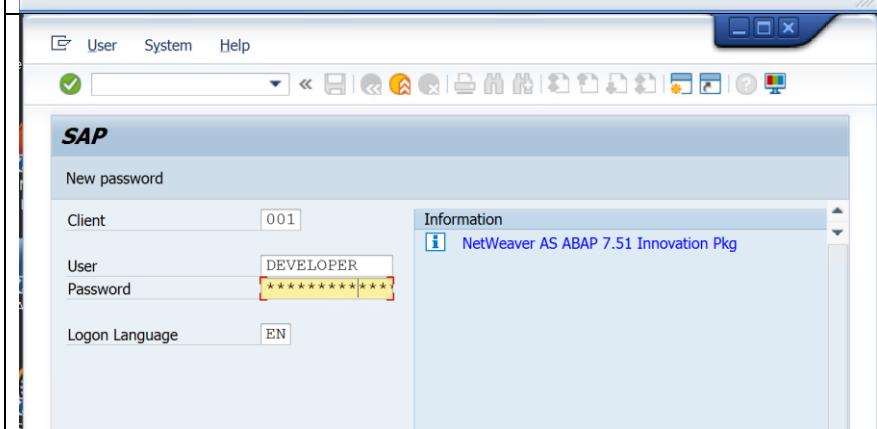


After a few minutes you are connected to a Server that hosts all the required tools to connect to the SAP System. Among them a fully configured SAP GUI





From the SAP Logon pad select the SAP System NPL and connect.



Makure sure the Client 001 is selected and login with user DEVELOPER and your SAP Instance Password

Note: Make sure that Logon Language is EN (otherwise you might have some wired issues with abapGit)