



## **Deploy and test an S/4HANA Cloud extension in Kyma**

This document demonstrates the steps to deploy and test an S/4HANA Cloud extension in SAP Business Technology Platform, Kyma Runtime.

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**THE BEST RUN**



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## DISCLAIMER

The information shared in this document is confidential and proprietary to SAP and may not be disclosed without the permission of SAP. All functionality presented here is subject to change and may be changed by SAP at any time for any reason without notice.

## OBJECTIVE

This document is aimed for cloud developers (beginners or seasoned) and DevOps professionals.

The objective of this exercise is to demonstrate the steps to deploy and test an S/4HANA Cloud extension in SAP Business Technology Platform, Kyma Runtime.

## SCENARIO

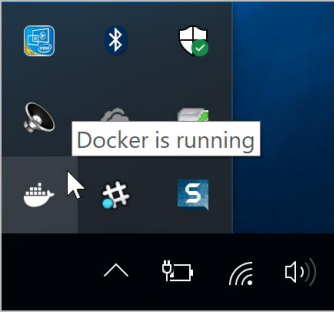
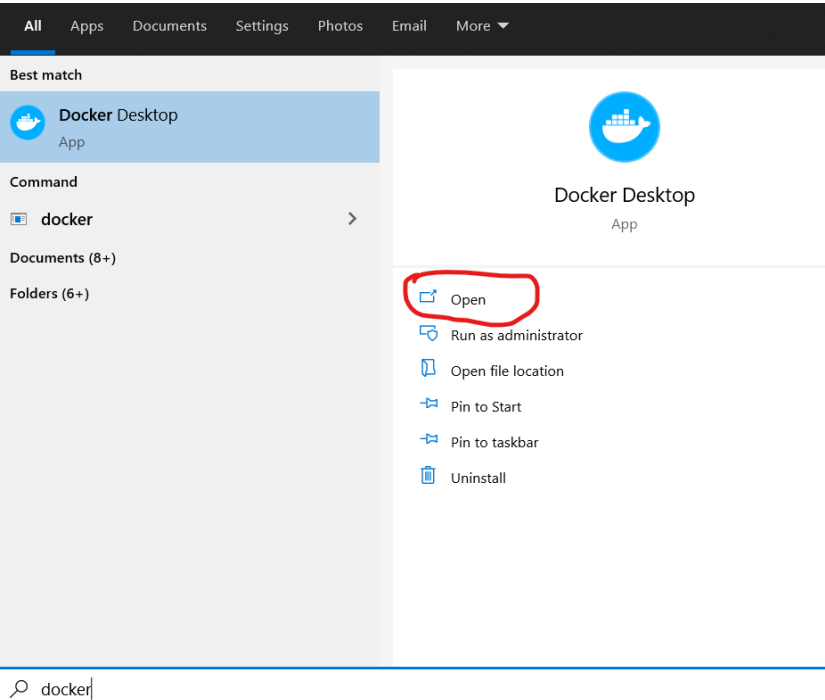
The S/4HANA Cloud extension is a simple Business Partner Management app, managing exclusively records of category “Person” and using only S/4HANA master data as persistence (nothing stored on the extension side, thus dismissing any database for persistence). It simply leverages the S/4 Business Partner OData service to execute the CRUD operations directly in the S/4 system, so it’s quite simple.

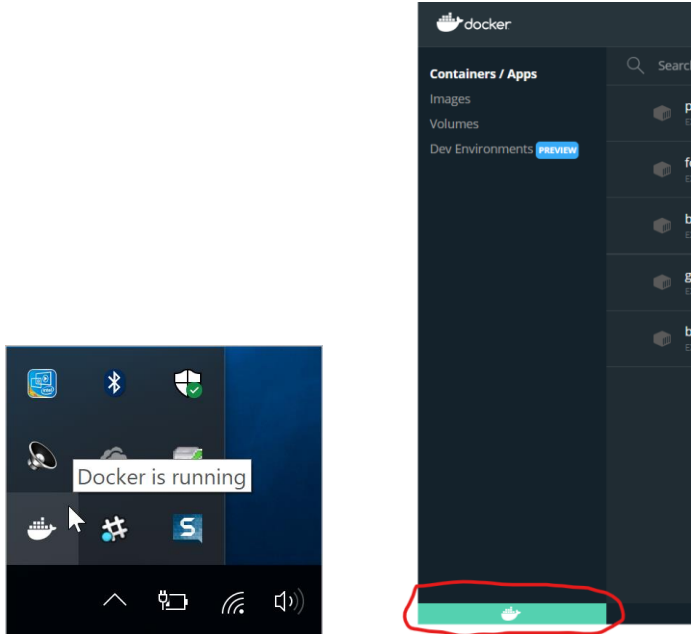
App components:

1. **Frontend UI: SAP Fiori Elements HTML5 app** based on the List Report/Object page templates. No coding on the UI – everything is interpreted from the backend service annotations by the Fiori Elements engine.
2. **Backend service: Cloud Application Programming Model app** with simple a service exposing an OData entity
3. **Create and update operations: Serverless Function** deployed directly in Kyma and invoked either directly or through an event message via event subscription. The event publishing can occur either from inside or outside the cluster (in the second case it uses another serverless function exposed outside the cluster via API Rule). All of this is determined through an environment parameter set upon application deployment.

## PREREQUISITES

- Have an **S/4HANA Cloud tenant** available with an active **communication user** set for inbound communication in a **communication arrangement** which is based on the communication scenario **SAP\_COM\_0008** (see: <https://help.sap.com/viewer/0f69f8fb28ac4bf48d2b57b9637e81fa/2108.501/en-US/fab3fd449cf74c6384622b98831e989e.html?q=communication%20arrangement>) – this is required to access the Business Partner OData Service v2.
  - How to get an S/4HANA Cloud trial: <https://www.sap.com/products/s4hana-erp/trial.html>
- Create an SAP BTP trial account: <https://developers.sap.com/tutorials/hcp-create-trial-account.html>
- Enable SAP BTP, Kyma Runtime: <https://developers.sap.com/tutorials/cp-kyma-getting-started.html>
- Set up local development environment using VS Code: <https://developers.sap.com/tutorials/btp-app-set-up-local-development.html>
- Install Kubectl: <https://kubernetes.io/docs/tasks/tools/>
- Install Helm Charts: <https://helm.sh/docs/intro/install/>
- Install Make tool (Windows users):
  - Install Chocolatey: <https://chocolatey.org/install>
  - Run: **choco install make**.
- Install Docker Desktop: <https://www.docker.com/products/docker-desktop/>
- Install Docker extension in VS Code: <https://code.visualstudio.com/docs/containers/overview>
- Create an account on Docker Hub: <https://hub.docker.com/>
- Make sure Docker Desktop is running locally successfully.

| Explanation  | Screenshot  |
|--|---|
| <p>Ensure docker symbol in windows taskbar.</p> <p>If not already running, please follow the steps here below.</p> |    |
| <p>Search docker desktop and click Open</p>  |  |

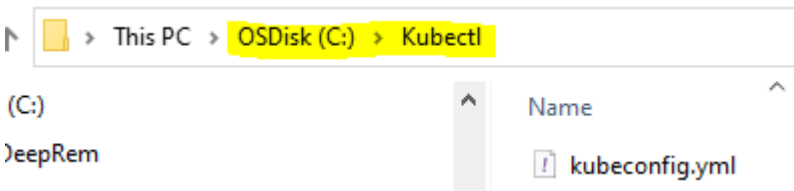
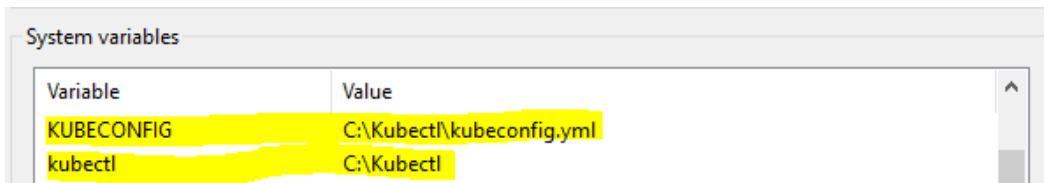
| Explanation                              | Screenshot   |
|--|--|
| Click docker icon and check green status |  |

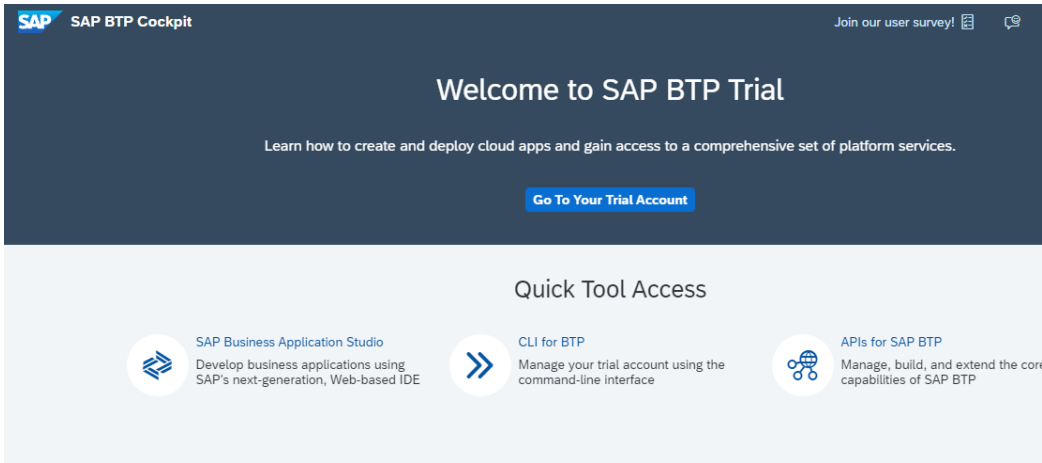
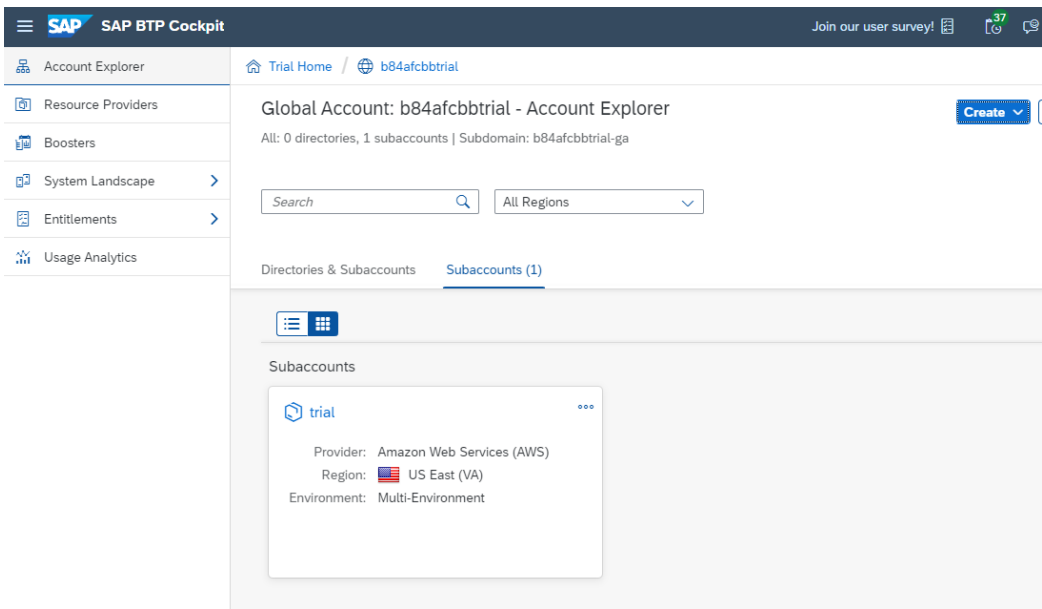
## WARNING

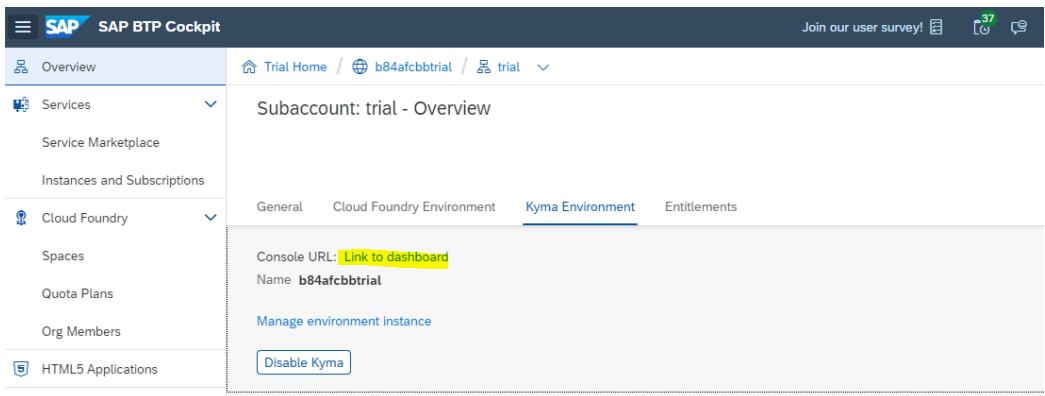
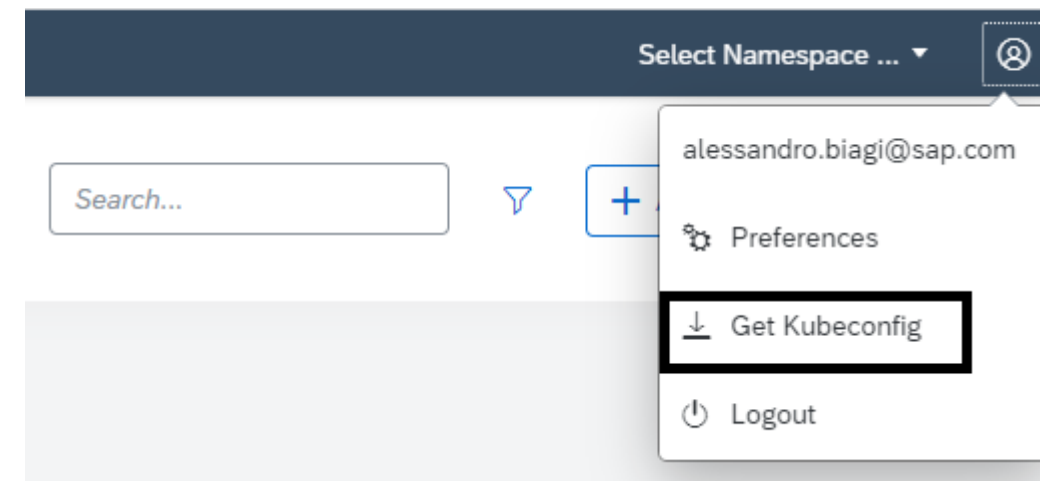
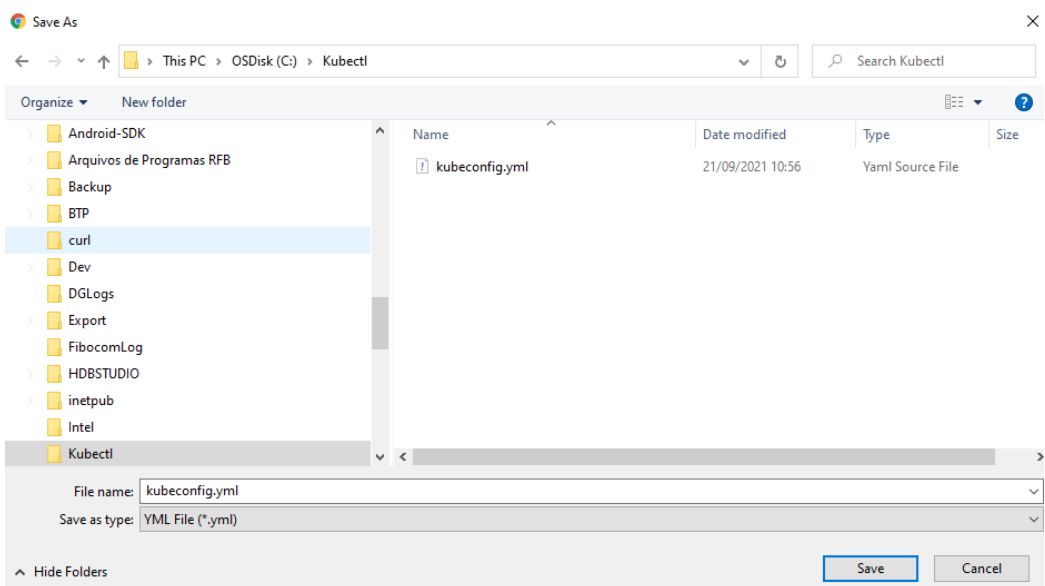
Failing to comply to any of the listed pre-requisites will prevent you from completing the exercise! Therefore, after completing each tutorial/document, make sure that everything you did is working properly!

## EXERCISE

### I. Set up Kubernetes context to point to the Kyma cluster


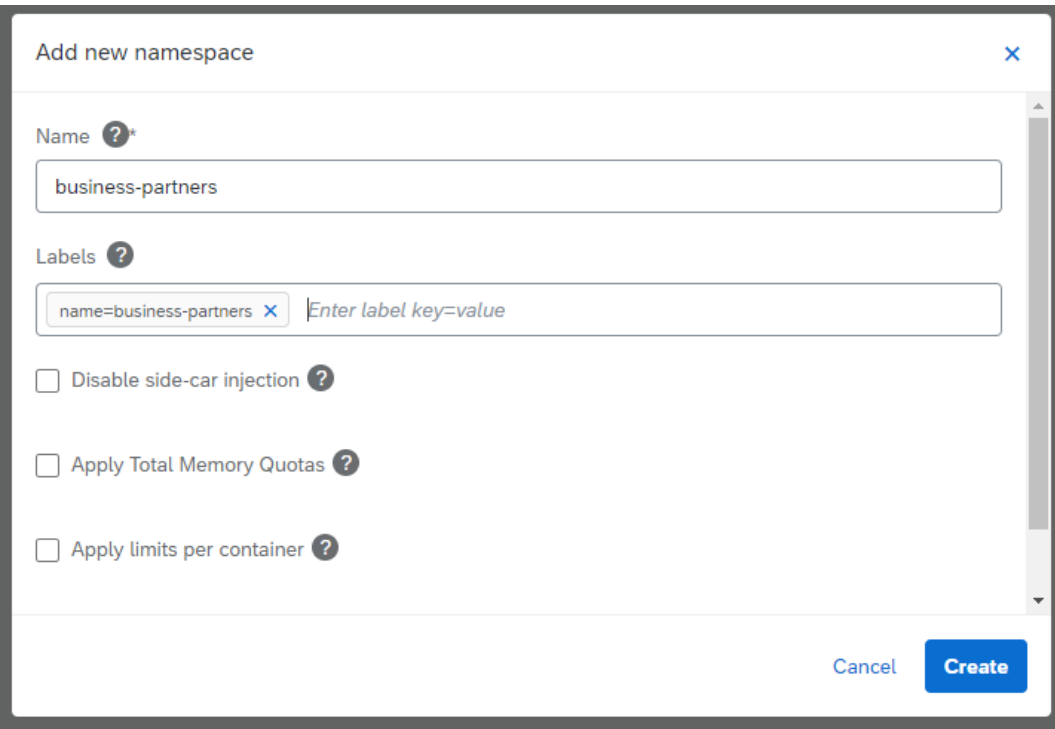
| Explanation   | Screenshot   |
|---|--|
| Create a folder on your hard-drive to store the <b>kubeconfig.yml</b> file (there's an <b>example</b> of a folder named "C:\Kubectl" in the screenshot).  |  |
| Set two system environment variables ( <b>examples</b> in the screenshot): <ul style="list-style-type: none"> <li>• <b>kubectl=&lt;your folder path&gt;</b></li> <li>• <b>KUBECONFIG=&lt;your r folder</b></li> </ul> |  |

| Explanation  | Screenshot  |
|--|---|
| <p><code>path&gt;\kubeconfig.yml</code></p> <p><b>Note:</b> variable names are case-sensitive!</p> |   |
| <p>Open your BTP trial account cockpit and click <b>Go To Your Trial Account</b></p>               |   |
| <p>Click on your subaccount</p>  |  |

| Explanation  | Screenshot   |
|--|--|
| <p>Select the <b>Kyma Environment</b> tab and click the link: “<b>Link to dashboard</b>”</p>   |    |
| <p>In the Kyma Console UI click on the “little head” icon on the top right corner and select <b>Get Kubeconfig</b></p>   |   |
| <p>Save the kubeconfig.yml file in the folder you created.</p> <p><b>Note:</b> if the file is already there due to a previous access just <b>overwrite it</b>. <b>Do not change the file name!</b></p> <p>These two steps to save the config file are required about 12 hours after each access to the cluster as the file token expires after that period..</p> |  |



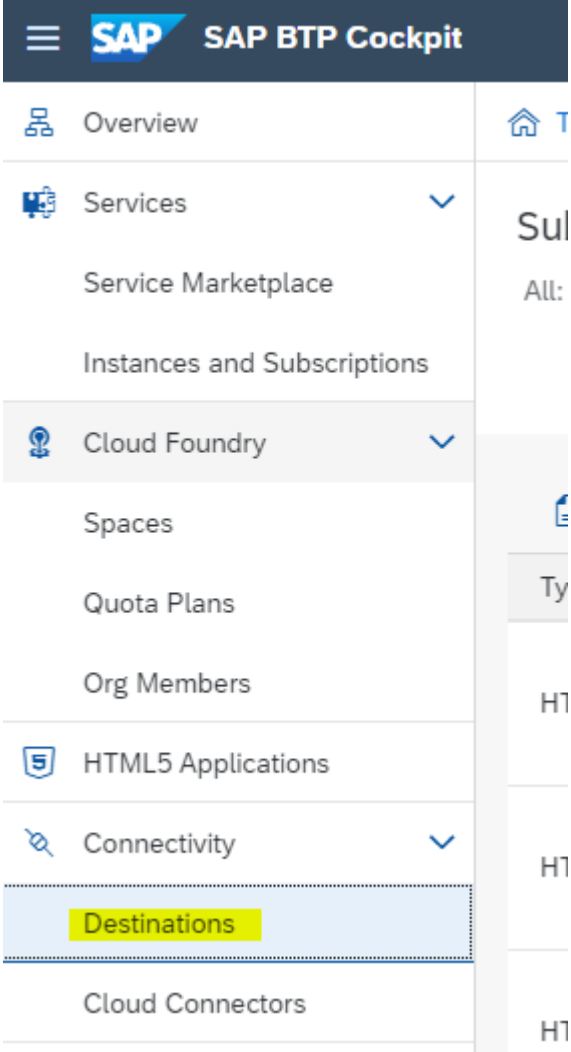
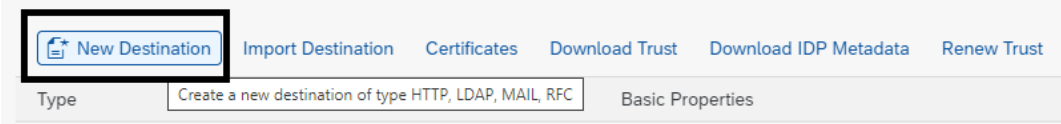
## II. Create the application namespace

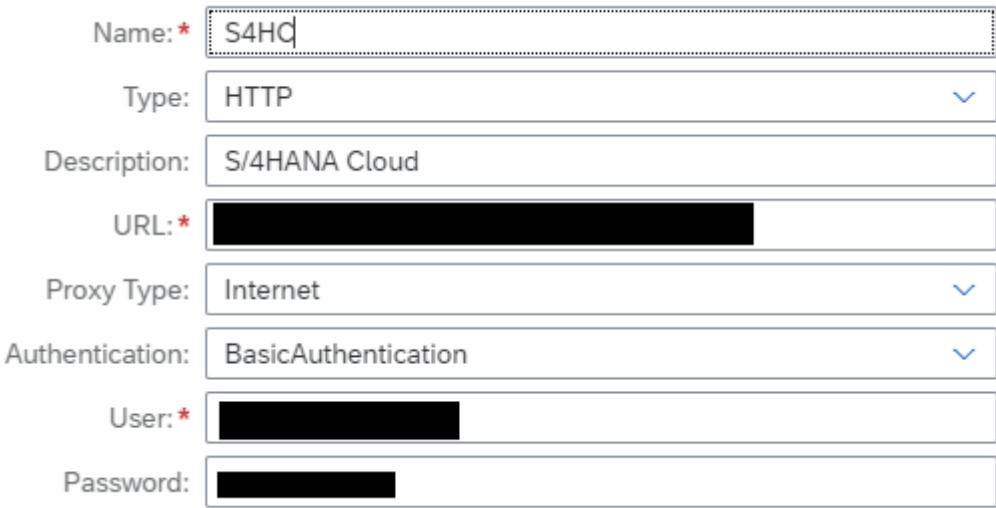
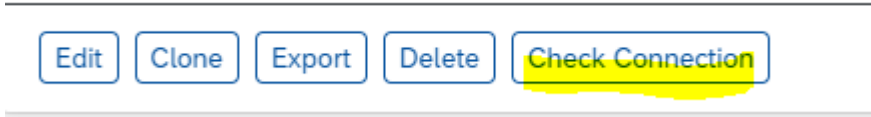
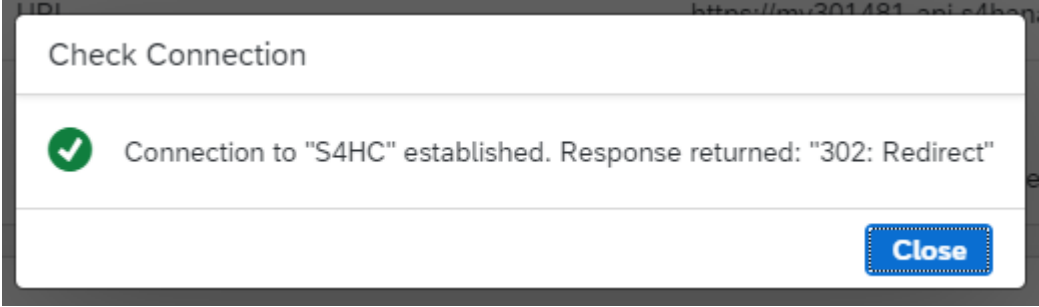
| Explanation  | Screenshot   |
|--|--|
| In the Kyma Console UI click on <b>Add new namespace</b> in the top right corner   |  A screenshot of the Kyma Console UI. It features a search bar with the placeholder text 'Search...', a filter icon, and a button labeled '+ Add new namespace' which is highlighted with a yellow background.   |
| In the dialog, set:<br><br>Name: <b>business-partners</b><br>Label: <b>name=business-partners</b><br><br>Click <b>Create</b> . |  A screenshot of the 'Add new namespace' dialog box. The dialog has a title bar with a close button. Inside, there is a 'Name' field with a question mark icon and an asterisk, containing the text 'business-partners'. Below it is a 'Labels' field with a question mark icon, containing a label 'name=business-partners' with a close button and a placeholder 'Enter label key=value'. There are three checkboxes: 'Disable side-car injection', 'Apply Total Memory Quotas', and 'Apply limits per container', each with a question mark icon. At the bottom right are 'Cancel' and 'Create' buttons. |

| Explanation   | Screenshot |
|---|------------|
| You should see a page like the one in the screenshot. |            |

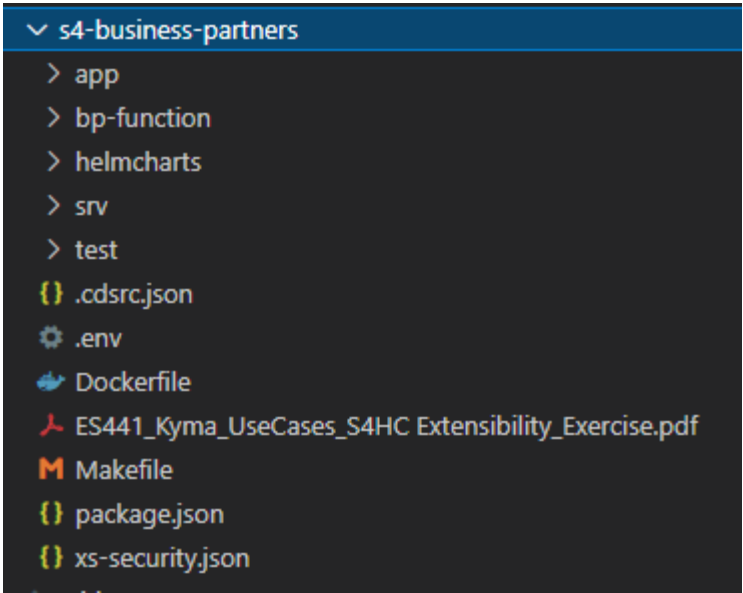
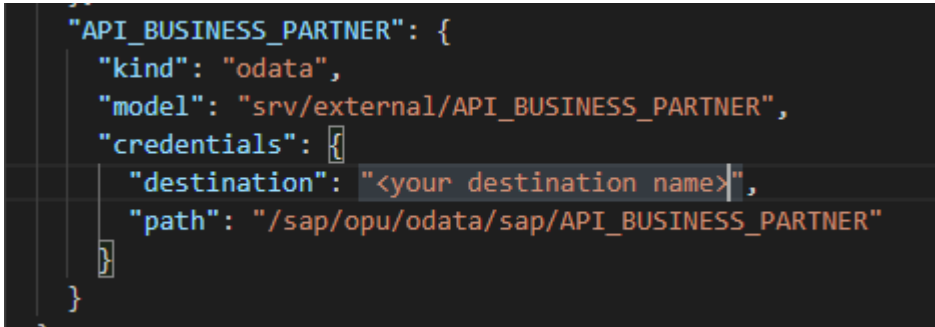
### III. Create the destination to S/4HANA Cloud

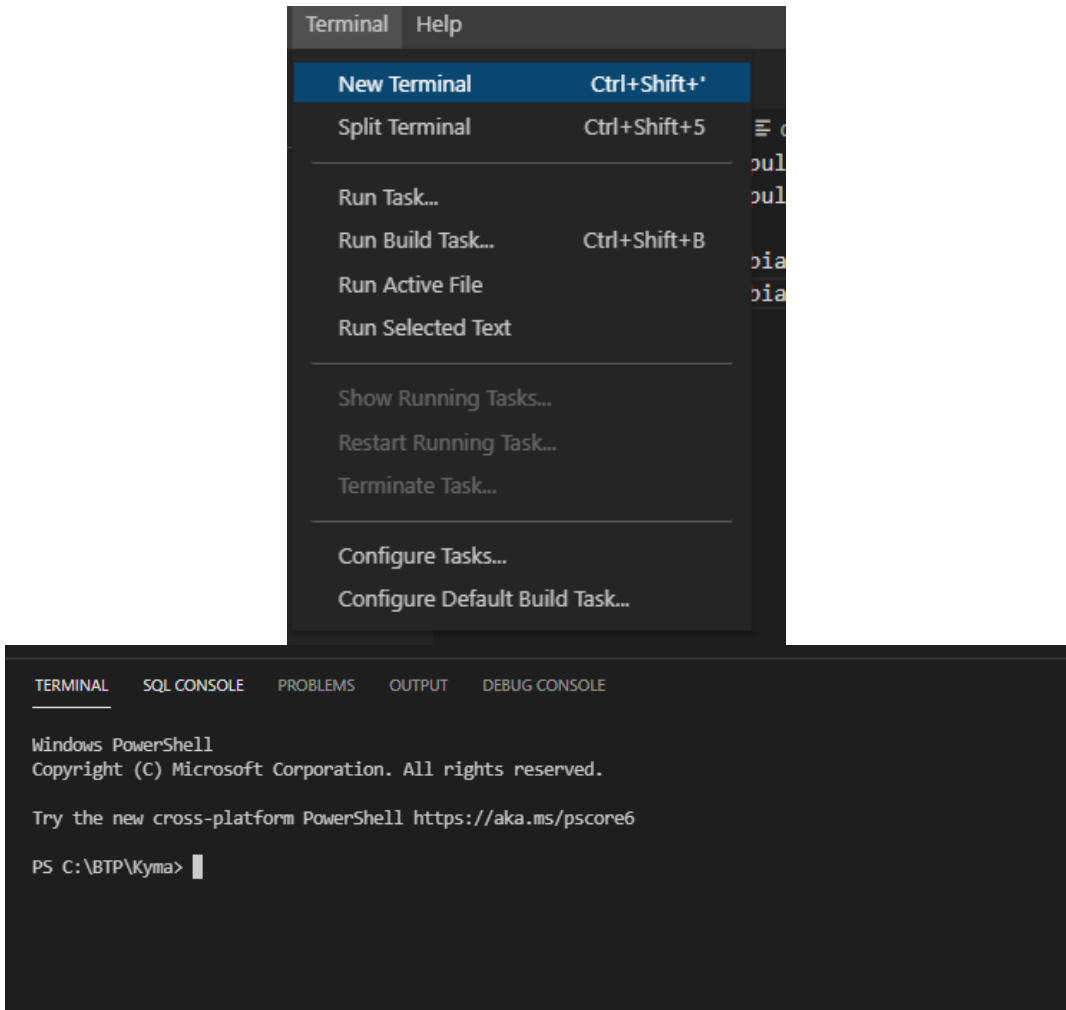
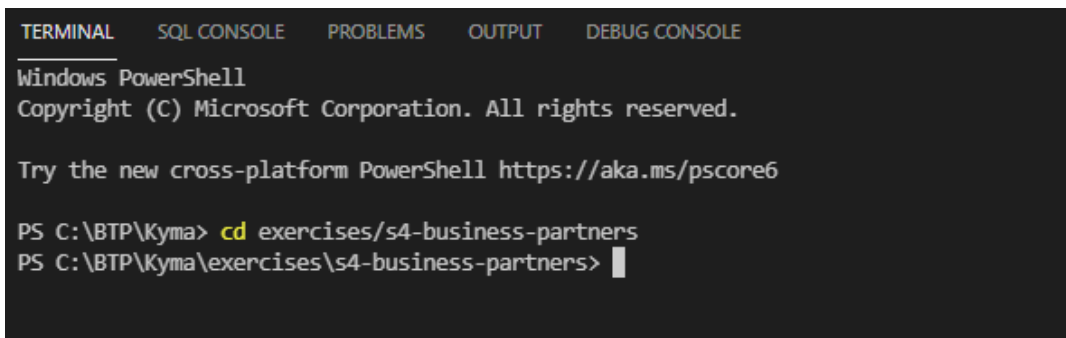
| Explanation                        | Screenshot |
|------------------------------------|------------|
| Go back to your subaccount cockpit |            |

| Explanation  | Screenshot   |
|--|--|
| In the left-hand side menu expand the <b>Connectivity</b> section and click on <b>Destinations</b> . |  <p>The screenshot shows the SAP BTP Cockpit interface. The left-hand menu is expanded to the 'Connectivity' section, which is highlighted in light blue. Under 'Connectivity', the 'Destinations' option is highlighted in yellow. Other options visible in the menu include Overview, Services, Service Marketplace, Instances and Subscriptions, Cloud Foundry, Spaces, Quota Plans, Org Members, HTML5 Applications, and Cloud Connectors. The right-hand side of the screenshot shows a partial view of the main content area, including a search bar and a list of items.</p> |
| Click on <b>New Destination</b> .  |  <p>The screenshot shows the 'Subaccount: trial - Destinations' page. The 'New Destination' button is highlighted with a black box. Other buttons visible include 'Import Destination', 'Certificates', 'Download Trust', 'Download IDP Metadata', and 'Renew Trust'. Below the buttons, there is a section for 'Type' with a dropdown menu showing 'Create a new destination of type HTTP, LDAP, MAIL, RFC' and a 'Basic Properties' tab.</p>   |

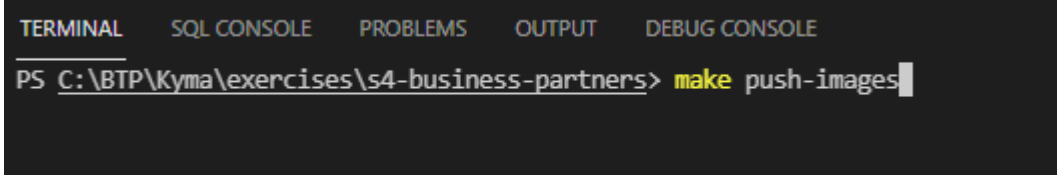
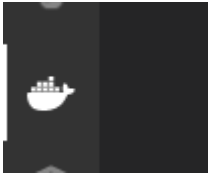
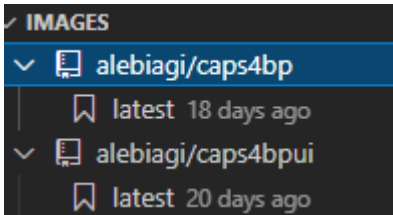
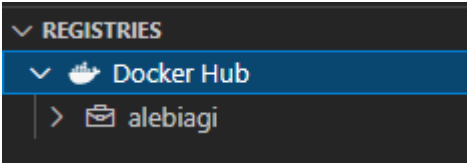
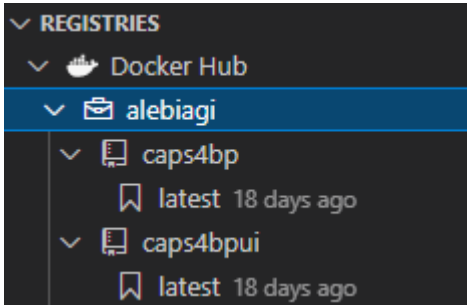
| Explanation   | Screenshot   |
|---|--|
| <p>Fill-in the destination info accordingly:</p> <p>Name: any name of your choice (i.e. S4HC – just a suggestion)<br/> Type: HTTP<br/> Description: S/4HANA Cloud<br/> URL: URL of your S/4HANA Cloud tenant<br/> Proxy Type: Internet<br/> Authentication: BasicAuthentication<br/> User: username of your communication user<br/> Password: password of your communication user</p> <p>Click <b>Save</b>.</p> |    |
| <p>In the bottom bar click <b>Check Connection</b>.</p>   |   |
| <p>If successful, you should see a dialog like the one in the screenshot.</p> <p>Just click <b>Close</b>.</p>   |  |

#### IV. Build and push the Docker images

| Explanation   | Screenshot  |
|---|---|
| Open the <b>s4-business-partners</b> folder from the cloned Git Repo in your <b>VS Code</b> .   |  A screenshot of the VS Code File Explorer sidebar. The 's4-business-partners' folder is expanded, showing a list of files and subfolders. The subfolders are 'app', 'bp-function', 'helmcharts', 'srv', and 'test'. The files listed are '.cdsrc.json', '.env', 'Dockerfile', 'ES441_Kyma_UseCases_S4HC Extensibility_Exercise.pdf', 'Makefile', 'package.json', and 'xs-security.json'.   |
| In the <b>File Explorer</b> on the left-hand pane, open the file <b>package.json</b> and replace the place holder <b>&lt;your destination name&gt;</b> with the name of the destination you created at the previous section (i.e. S4HC).<br><br><b>Save the file.</b> |  A screenshot of the 'package.json' file in VS Code. The file contains a JSON object with the following properties: 'API_BUSINESS_PARTNER' (an object), 'kind' (string 'odata'), 'model' (string 'srv/external/API_BUSINESS_PARTNER'), 'credentials' (an object), 'destination' (string '<your destination name>'), and 'path' (string '/sap/opu/odata/sap/API_BUSINESS_PARTNER'). The 'destination' value is highlighted with a mouse cursor. |

| Explanation   | Screenshot   |
|---|--|
| <p>From the menu <b>Terminal</b> select <b>New Terminal</b> to open the command terminal.</p>                   |  <p>The screenshot shows the Visual Studio interface. The 'Terminal' menu is open, displaying options like 'New Terminal' (highlighted), 'Split Terminal', 'Run Task...', 'Run Build Task...', 'Run Active File', 'Run Selected Text', 'Show Running Tasks...', 'Restart Running Task...', 'Terminate Task...', 'Configure Tasks...', and 'Configure Default Build Task...'. Below the menu, the terminal window is visible, showing a Windows PowerShell prompt at 'PS C:\BTP\Kyma&gt;'.</p> |
| <p>CD into the project folder of the project</p> <p><b>cd &lt;your cloned root&gt;/s4-business-partners</b></p> |  <p>The screenshot shows the terminal window with the command 'cd exercises/s4-business-partners' entered and executed. The prompt changes to 'PS C:\BTP\Kyma\exercises\s4-business-partners&gt;'.</p>   |

| Explanation  | Screenshot   |
|--|--|
| <p>Build the CAP application with the command:</p> <p><b>cds build --production</b></p>  |  <pre> TERMINAL  SQL CONSOLE  PROBLEMS  OUTPUT  DEBUG CONSOLE Windows PowerShell Copyright (C) Microsoft Corporation. All rights reserved.  Try the new cross-platform PowerShell https://aka.ms/pscore6  PS C:\BTP\Kyma&gt; cd exercises\s4-business-partners PS C:\BTP\Kyma\exercises\s4-business-partners&gt; cds build --production </pre>   |
| <p>Check the <b>logs in the console</b>, as well as the <b>file explorer</b> to verify the contents of the folder <b>gen\srv</b> has been properly generated.</p>  |  <pre> [cds] - done &gt; wrote output to: gen\srv\.cfignore gen\srv\manifest.yml gen\srv\package.json gen\srv\srv\bp-adm-service.js gen\srv\srv\csn.json gen\srv\srv\external\API_BUSINESS_PARTNER.csn gen\srv\srv\external\API_BUSINESS_PARTNER.edmx gen\srv\srv\helper.js  [cds] - build completed in: 477.865ms </pre> <p>File Explorer view of gen\srv:</p> <ul style="list-style-type: none"> <li>&gt; srv</li> <li>.cfignore</li> <li>! manifest.yml</li> <li>{ package.json</li> </ul> |
| <p>In the <b>File Explorer</b> on the left-hand pane, open the <b>Makefile</b> and replace the place holder <b>&lt;your docker account&gt;</b> with the name of the Docker account you must have created as per the 9<sup>th</sup> prerequisite of this document.</p> <p><b>Save the file.</b></p> |  <pre> DOCKER_ACCOUNT=&lt;your docker account&gt;  build-capimage: ## Build the container without caching     docker build --pull --rm -f Dockerfile -t \$(DOCKER_ACCOUNT)/caps4bp:latest .  build-uiimage:     docker build --pull --rm -f app/ui.Dockerfile -t \$(DOCKER_ACCOUNT)/caps4bpui:latest ./app  push-images: build-capimage build-uiimage     docker push \$(DOCKER_ACCOUNT)/caps4bp:latest     docker push \$(DOCKER_ACCOUNT)/caps4bpui:latest </pre>                           |

| Explanation  | Screenshot  |
|--|---|
| Build and push the Docker images with the command:<br><br><b>make push-images</b>  |  A screenshot of a terminal window with tabs for 'TERMINAL', 'SQL CONSOLE', 'PROBLEMS', 'OUTPUT', and 'DEBUG CONSOLE'. The terminal shows the command 'PS C:\BTP\Kyma\exercises\s4-business-partners> make push-images' with a cursor at the end. |
| When the process is completed access the VS Code Docker extension the left-hand panel clicking on the icon in the screenshot.              |  A screenshot of the Docker extension icon in the VS Code left-hand panel, which is a white Docker logo on a dark background.   |
| Expand the <b>Images</b> node and check whether the two images have been created.  |  A screenshot of the Docker Images panel in VS Code. It shows two images: 'alebiagi/caps4bp' with a 'latest' tag from 18 days ago, and 'alebiagi/caps4bpui' with a 'latest' tag from 20 days ago.   |
| Expand the <b>Registries</b> node and the <b>Docker Hub</b> node. You should see your <b>Docker account</b> listed like in the screenshot. |  A screenshot of the Docker Registries panel in VS Code. It shows the 'Docker Hub' registry expanded, displaying the 'alebiagi' account.   |
| Expand your <b>Docker account</b> and check whether the two images have been pushed  |  A screenshot of the Docker Registries panel in VS Code. It shows the 'alebiagi' account expanded, displaying two images: 'caps4bp' with a 'latest' tag from 18 days ago, and 'caps4bpui' with a 'latest' tag from 18 days ago.                 |

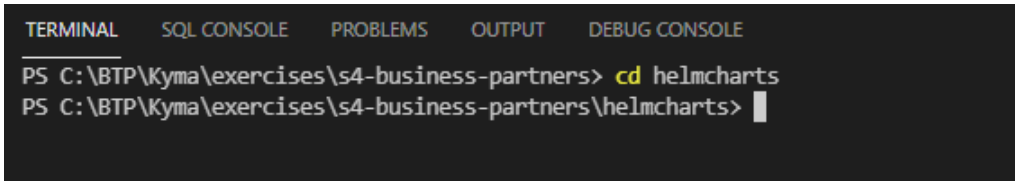
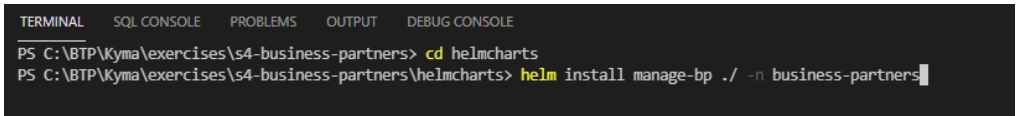
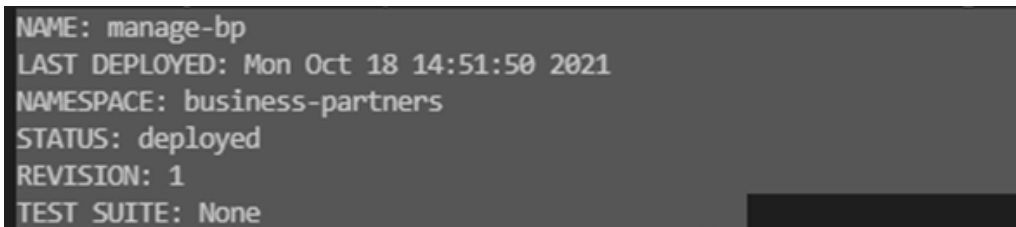


## V. Adjust the Helm Charts values

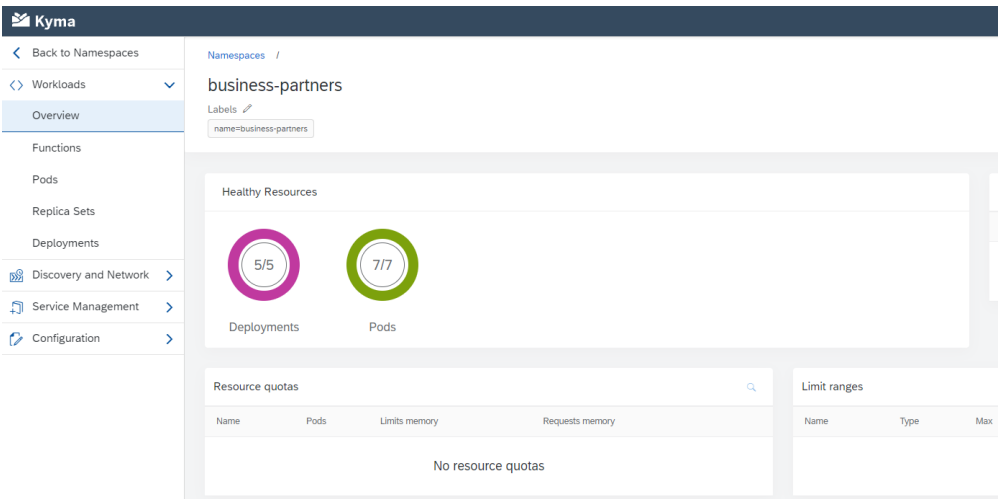
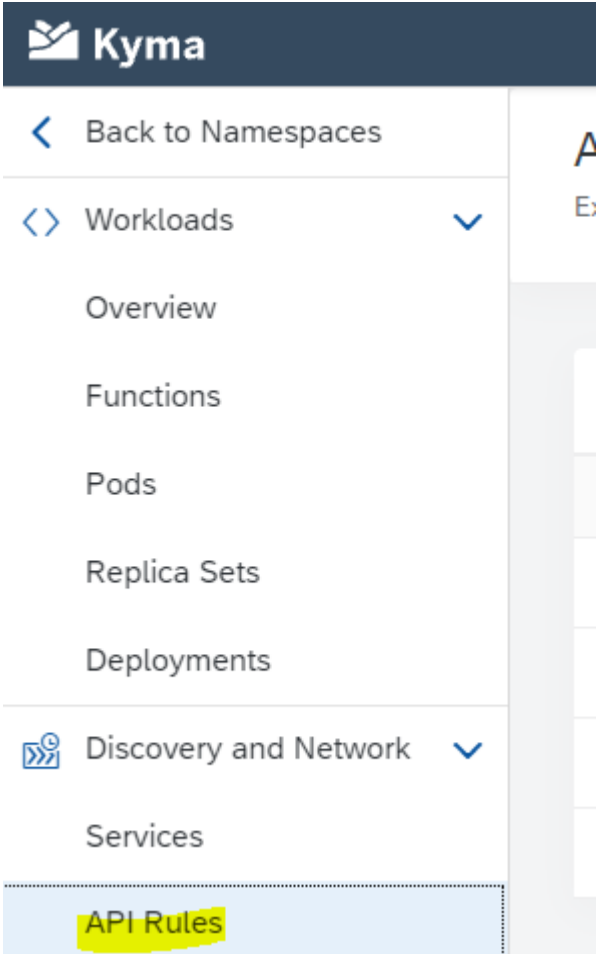
| Explanation   | Screenshot |
|---|------------|
| Go back to the Kyma Console UI  |            |
| Look at the URL in browser and copy the cluster URL (text right after “console.” stopping right before the slash to the clipboard, like demonstrated in the screenshot.   |            |
| <p>In the <b>File Explorer</b> on the left-hand pane, expand the <b>helmcharts</b> folder and open the file <b>values.yaml</b>.</p> <p>Replace the place holders accordingly:</p> <p>Over <b>&lt;your docker account&gt;</b> write your account name</p> <p>Over <b>&lt;your cluster url&gt;</b> paste the value copied in the previous step</p> <p>Over <b>&lt;your destination name&gt;</b> write the name of</p> |            |

| Explanation   | Screenshot |
|---|------------|
| <p>the destination created at section III (i.e. S4HC).</p> <p><b>Save the file.</b></p> |            |

## VI. Install the package

| Explanation  | Screenshot   |
|--|--|
| <p>In the terminal, CD to the <b>helmcharts</b> folder.</p>  |  <pre> TERMINAL  SQL CONSOLE  PROBLEMS  OUTPUT  DEBUG CONSOLE PS C:\BTP\Kyma\exercises\s4-business-partners&gt; cd helmcharts PS C:\BTP\Kyma\exercises\s4-business-partners\helmcharts&gt; </pre>  |
| <p>Install the package with the command:</p> <p><b>helm install manage-bp ./ -n business-partners</b></p>      |  <pre> TERMINAL  SQL CONSOLE  PROBLEMS  OUTPUT  DEBUG CONSOLE PS C:\BTP\Kyma\exercises\s4-business-partners&gt; cd helmcharts PS C:\BTP\Kyma\exercises\s4-business-partners\helmcharts&gt; helm install manage-bp ./ -n business-partners </pre> |
| <p>After some seconds you should see the contents displayed in the screenshot in the logs of your console.</p> |  <pre> NAME: manage-bp LAST DEPLOYED: Mon Oct 18 14:51:50 2021 NAMESPACE: business-partners STATUS: deployed REVISION: 1 TEST SUITE: None </pre>  |

## VII. Test the application

| Explanation  | Screenshot  |
|--|---|
| <p>It's going to take a couple of minutes until all deployments and pods are running healthy in your Kyma namespace.</p> <p>So, go back to your Kyma Console UI and wait until it shows a status exactly like in the screenshot.</p> |   |
| <p>On the left-hand pane expand <b>Discovery and Network</b> and click on <b>API Rules</b></p>   |  |

Click on the **URL** next to the **manage-bp-ui-app-router** API Rule, like demonstrated in the screenshot to open the application.

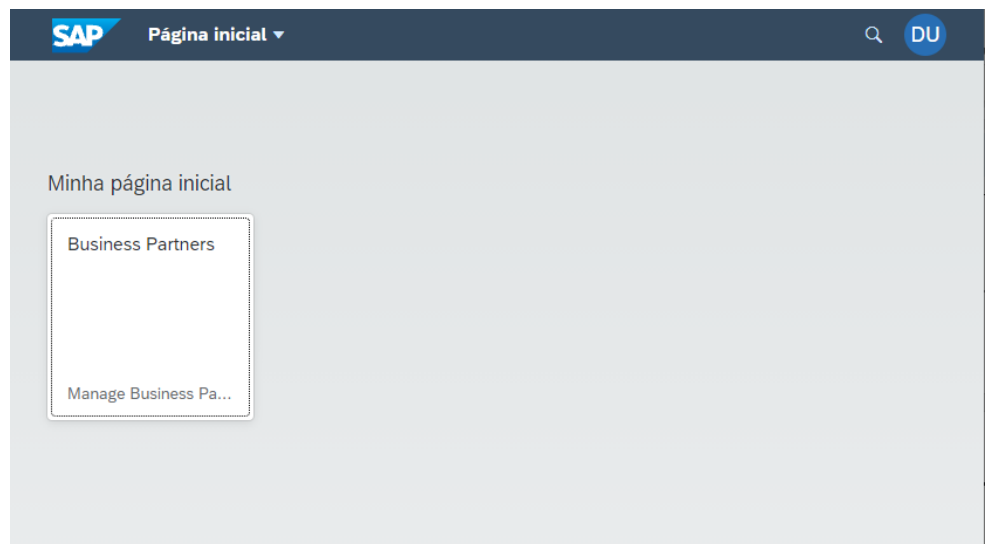
## API Rules

Expose Services outside the cluster with API Rules.

| Name                                   | Host  |
|--|---|
| <a href="#">manage-bp-updfunc</a>      | <a href="https://manage-bp-updfunc.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com">https://manage-bp-updfunc.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com</a>           |
| <a href="#">manage-bp-ui-approuter</a> | <a href="https://manage-bp-ui-approuter.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com">https://manage-bp-ui-approuter.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com</a> |
| <a href="#">manage-bp-caps4bp</a>      | <a href="https://manage-bp-caps4bp.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com">https://manage-bp-caps4bp.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com</a>           |
| <a href="#">manage-bp-eventpub</a>     | <a href="https://manage-bp-eventpub.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com">https://manage-bp-eventpub.b77cd9f.kyma.shoot.live.k8s-hana.ondemand.com</a>         |

A new tab should be opened in your browser displaying a tile like in the screenshot.

Click on the **Business Partners** tile.

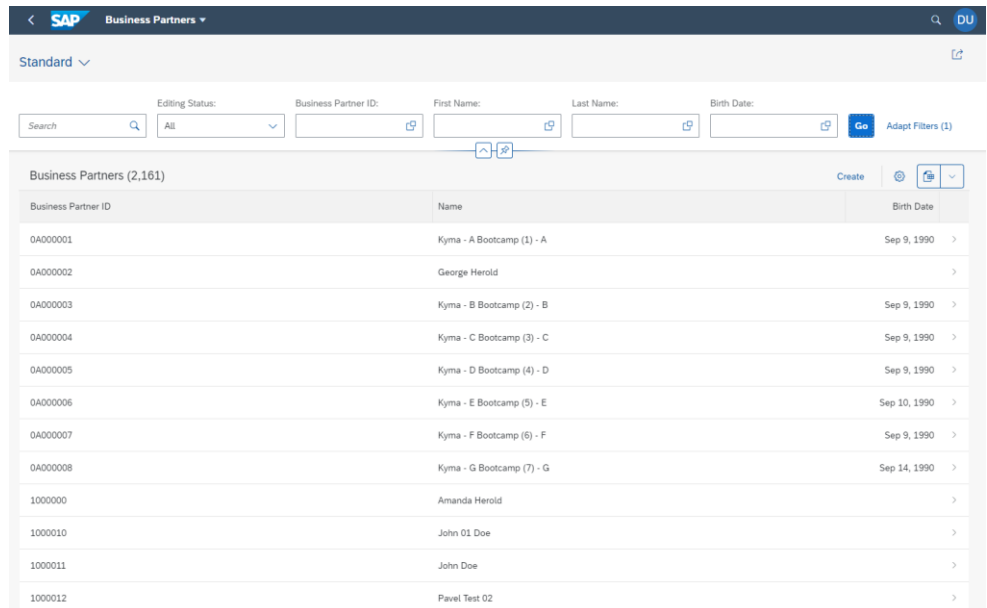


In the next page click on the **Go** button.



In the first click it's going to take a couple of seconds until the Business Partners list is displayed like in the screenshot. This is due to the in-memory table creation and fill-up at first access.

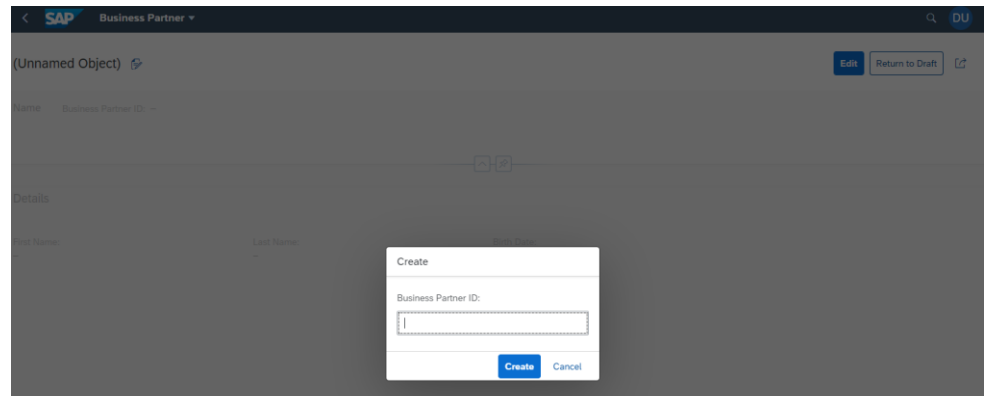
Click on the **Create** button to create a new Business Partner.



The screenshot shows the SAP Business Partners list. At the top, there is a header bar with the SAP logo and 'Business Partners'. Below it, a search bar and filters are visible. The main table lists 12 business partners with columns for ID, Name, and Birth Date. The 'Create' button is highlighted in the top right corner of the table area.

| Business Partner ID | Name                      | Birth Date   |
|---------------------|---------------------------|--------------|
| 0A000001            | Kyma - A Bootcamp (1) - A | Sep 9, 1990  |
| 0A000002            | George Herold             |              |
| 0A000003            | Kyma - B Bootcamp (2) - B | Sep 9, 1990  |
| 0A000004            | Kyma - C Bootcamp (3) - C | Sep 9, 1990  |
| 0A000005            | Kyma - D Bootcamp (4) - D | Sep 9, 1990  |
| 0A000006            | Kyma - E Bootcamp (5) - E | Sep 10, 1990 |
| 0A000007            | Kyma - F Bootcamp (6) - F | Sep 9, 1990  |
| 0A000008            | Kyma - G Bootcamp (7) - G | Sep 14, 1990 |
| 10000000            | Amanda Herold             |              |
| 10000010            | John 01 Doe               |              |
| 10000011            | John Doe                  |              |
| 10000012            | Pavel Test 02             |              |

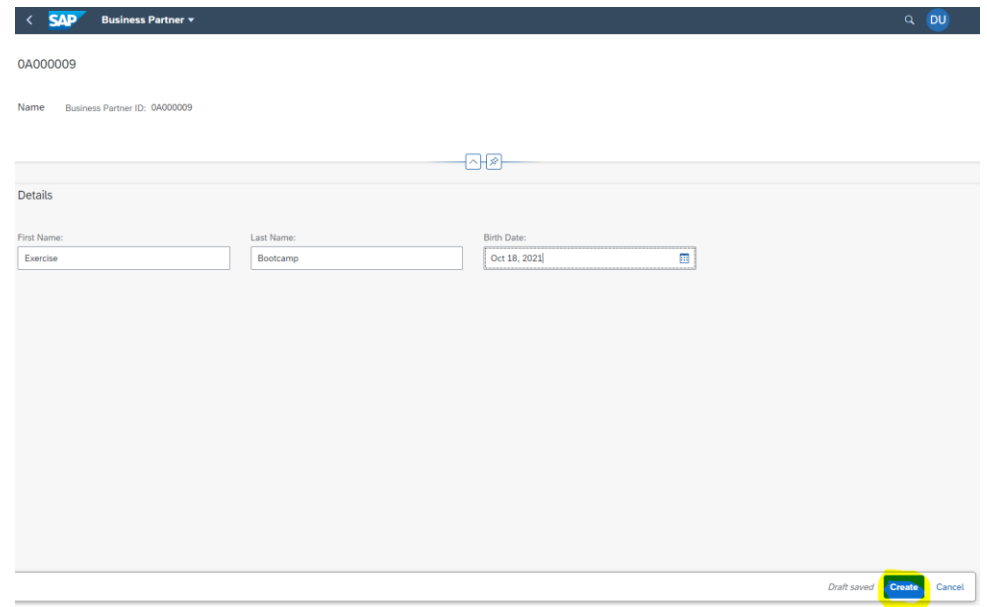
Provide a Business Partner ID that does not exist yet in the S/4 system and click on **Create**.



The screenshot shows the SAP Business Partner creation form. The form is titled '(Unnamed Object)'. It has fields for Name, Business Partner ID, First Name, Last Name, and Birth Date. A 'Create' button is highlighted in the bottom right corner.

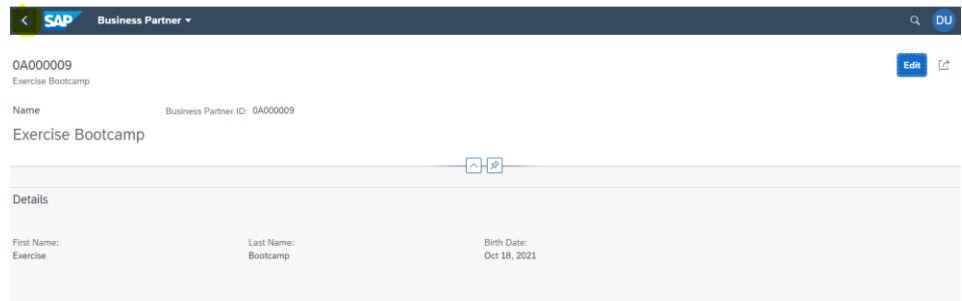
Provide First Name, Last Name and Birth Date.

Click on **Create**.



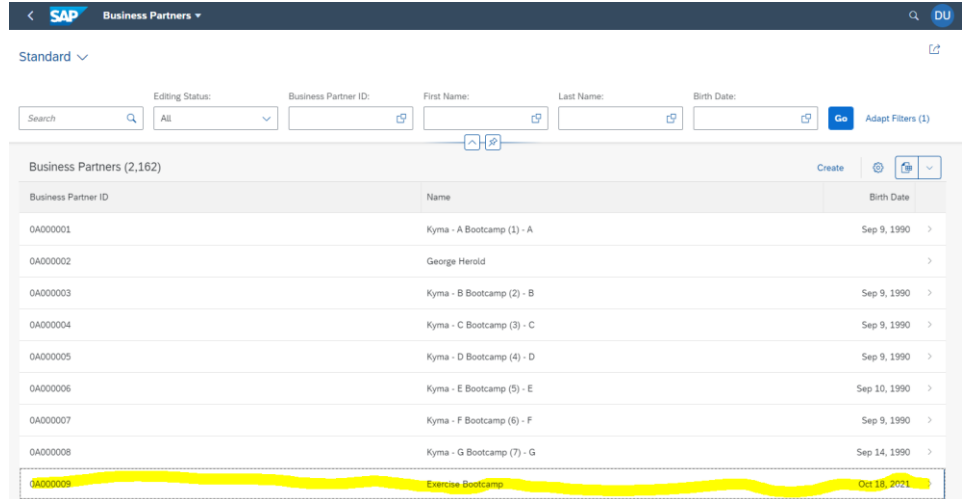
The screenshot shows the SAP Business Partner creation form with data entered. The Business Partner ID is '0A000009'. The First Name is 'Exercise', the Last Name is 'Bootcamp', and the Birth Date is 'Oct 18, 2021'. The 'Create' button is highlighted in the bottom right corner.

Check that the Business Partner has been successfully created and click on the arrow at the top left corner to go back to the Business Partners list.



The screenshot shows the SAP Business Partner details for ID OA000009. The name is "Exercise Bootcamp". The details section shows: First Name: Exercise, Last Name: Bootcamp, Birth Date: Oct 18, 2021. An "Edit" button is in the top right corner.

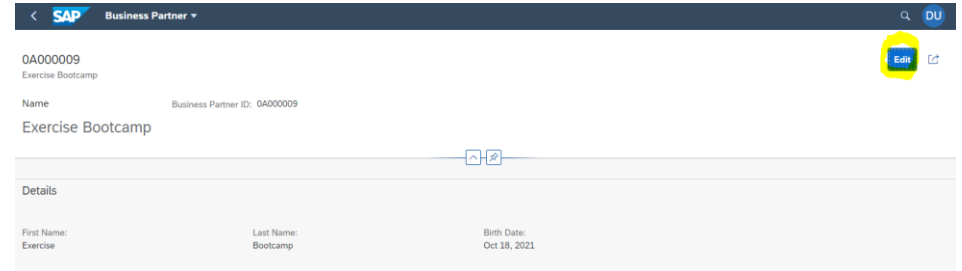
In the list, locate the newly created Business Partner and click on it.



The screenshot shows the SAP Business Partners list. The table has columns: Business Partner ID, Name, and Birth Date. The newly created partner, OA000009, is highlighted in yellow. It is named "Exercise Bootcamp" and has a birth date of "Oct 18, 2021".

| Business Partner ID | Name                      | Birth Date   |
|---------------------|---------------------------|--------------|
| OA000001            | Kyma - A Bootcamp (1) - A | Sep 9, 1990  |
| OA000002            | George Herold             |              |
| OA000003            | Kyma - B Bootcamp (2) - B | Sep 9, 1990  |
| OA000004            | Kyma - C Bootcamp (3) - C | Sep 9, 1990  |
| OA000005            | Kyma - D Bootcamp (4) - D | Sep 9, 1990  |
| OA000006            | Kyma - E Bootcamp (5) - E | Sep 10, 1990 |
| OA000007            | Kyma - F Bootcamp (6) - F | Sep 9, 1990  |
| OA000008            | Kyma - G Bootcamp (7) - G | Sep 14, 1990 |
| OA000009            | Exercise Bootcamp         | Oct 18, 2021 |

Click on the **Edit** button on the top right corner.



This screenshot is identical to the one above, but the "Edit" button in the top right corner is highlighted with a yellow circle.

Change the information on the fields at your will and click on **Save**.

The screenshot shows the SAP Business Partner form for ID 0A000009. The form is titled "Exercise Bootcamp". It has a "Details" section with three input fields: "First Name" (Exercise 1), "Last Name" (Bootcamp - Kyma), and "Birth Date" (Oct 15, 2021). At the bottom right, there is a "Save" button highlighted with a yellow circle, along with "Draft saved" and "Cancel" text.

Check that the data has been successfully updated and click on the arrow at the top left corner to go back to the Business Partners list.

The screenshot shows the SAP Business Partner form for ID 0A000009. The form is titled "Exercise 1 Bootcamp - Kyma". It has a "Details" section with three input fields: "First Name" (Exercise 1), "Last Name" (Bootcamp - Kyma), and "Birth Date" (Oct 15, 2021). At the top left, there is a blue arrow button pointing left, which is used to navigate back to the Business Partners list.

In the list, locate the recently updated record.

The screenshot shows the SAP Business Partners list. The table has three columns: "Business Partner ID", "Name", and "Birth Date". The last record, ID 0A000009, is highlighted with a yellow background. The table is titled "Business Partners (2,162)".

| Business Partner ID | Name                       | Birth Date   |
|---------------------|----------------------------|--------------|
| 0A000001            | Kyma - A Bootcamp (1) - A  | Sep 9, 1990  |
| 0A000002            | George Herold              |              |
| 0A000003            | Kyma - B Bootcamp (2) - B  | Sep 9, 1990  |
| 0A000004            | Kyma - C Bootcamp (3) - C  | Sep 9, 1990  |
| 0A000005            | Kyma - D Bootcamp (4) - D  | Sep 9, 1990  |
| 0A000006            | Kyma - E Bootcamp (5) - E  | Sep 10, 1990 |
| 0A000007            | Kyma - F Bootcamp (6) - F  | Sep 9, 1990  |
| 0A000008            | Kyma - G Bootcamp (7) - G  | Sep 14, 1990 |
| 0A000009            | Exercise 1 Bootcamp - Kyma | Oct 15, 2021 |

## Congratulations!

You have successfully completed the exercise!

To claim your expert badge, just **submit the exact same screenshots** of this topic taken from your own deployment to the corresponding **MS Teams Channel**.





## APPENDIX

### Stretch and challenge yourself!

Now that you have successfully completed the exercise you can go further and try the application in different modes using the **Kyma eventing feature**.

In the **values.yaml** file of the helm charts, just change the **updatemode** variable to **in-cluster** (to publish the event from inside the cluster) or **out-cluster** (to publish the event from outside the cluster).

Then, to update your deployment, CD to the helmcharts folder and run:

**helm upgrade manage-bp ./ -n business-partners**

After the command successfully completes, repeat the steps in the last block of the exercise to test the application.

Please note that this is **totally optional** thus **will not be required** for the expert badge request.