

Requirements

This document guides through the steps to be executed to implement the Execution POD Plugin example and templates for the Execution POD Plugin for synchronous and asynchronous types. Plugins to be deployed to SAP BTP Cloud Foundry to extend standard POD functionality with custom POD Plugins functionality.

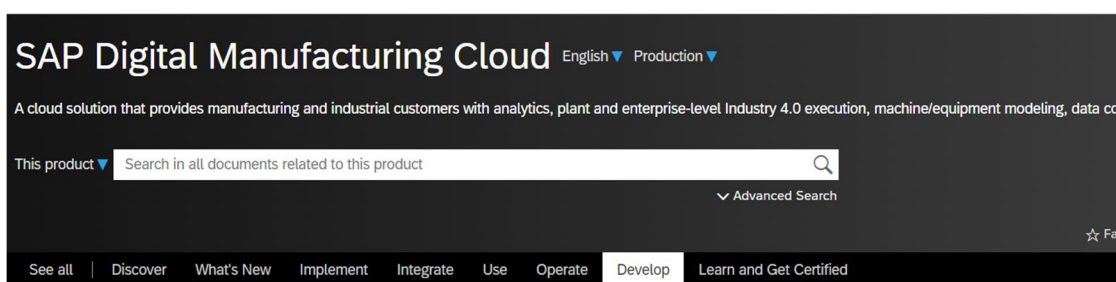
SAP Business Application Studio is used as a development environment for implementing Execution POD Plugins.

For setting up SAP Business Application Studio in an Enterprise Account refer to [Getting Started](#) topic of the SAP Business Application Studio Administrator Guide.

Project details:

- The “Example for Execution Plugin” (podplugins/webapp/exampleExecutionPlugin) demonstrates how to implement an “Execution” type plugin that can Start and Complete SFC on the POD. The Property Editor provides a value help button to allow selecting an Action Button for Start and Complete which is to be executed by this plugin. A switch describes whether this plugin will run synchronously or asynchronously. Operation filter controls if SFC should be processed at a specific operation. If SFC is in new or active status then SFC will be started, if SFC is in the queue – then will be completed. Plugin’s business logic assumes that only one SFC is selected.
- The “Execution Plugin Template” (podplugins/webapp/executionPluginTemplate) demonstrates how to have an execution type plugin run synchronously. It is a template that can be copy-pasted and adjusted as needed for the custom Execution POD Plugin.
- The “Asynch Execution Plugin Template” (podplugins/webapp/asynchExecutionPluginTemplate) demonstrates how to have an execution type plugin run asynchronously. It is a template that can be copy-pasted and adjusted as needed for the custom Execution POD Plugin.

See the Production Operator Dashboard (POD) Plugin Developer's Guide at link https://help.sap.com/docs/SAP_DIGITAL_MANUFACTURING_CLOUD?task=develop_task for more technical details that will help with POD Plugin implementations.



**Development**

[Production Operator Dashboard Plugin Developer's Guide](#)
Learn how to create plugins for display and execution in the Production Operator Dashboard (POD).

[Business Process Extensions – Developer's Guide](#)
Learn how to configure SAP BTP, serverless runtime for SAP Digital Manufacturing Cloud and register services in service registry for further reuse in Production Process Designer and POD Designer.
[Also available as PDF](#)

[SAP Samples #](#)
Find samples for plugins, business processes, as well as other useful content to show how you can extend your solution to meet your needs.

[API References for SAP Digital Manufacturing Cloud](#)
Discover integration packages on the SAP API Business Hub that offer integration and extensibility options for

Prerequisites

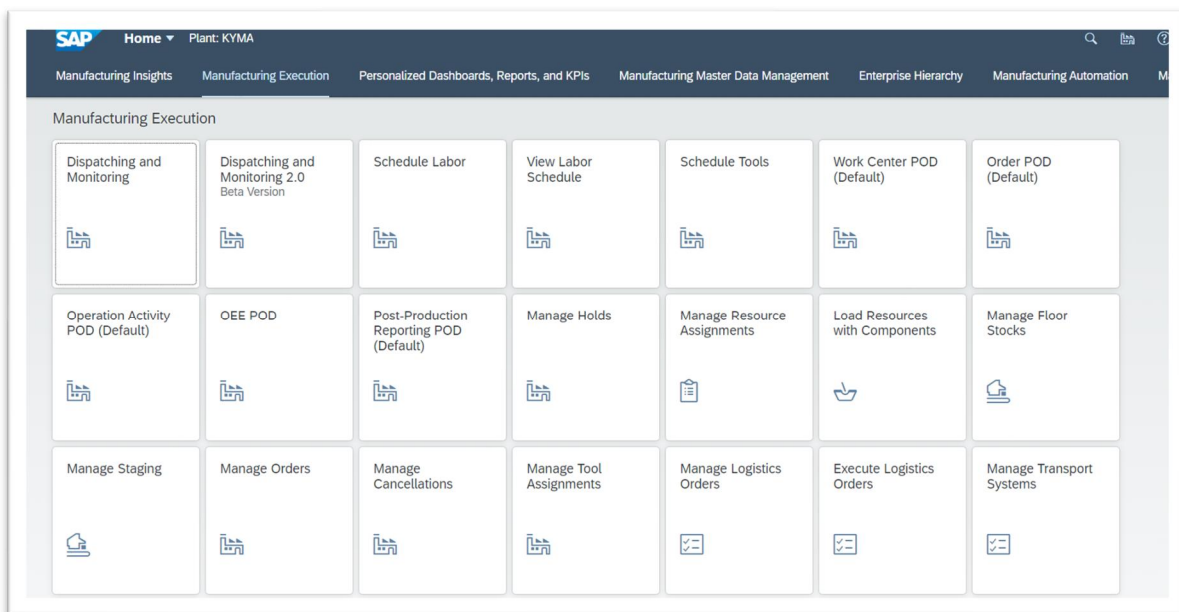
If you plan to follow the installation and configuration steps and deploy the project by yourself, you have to do some preparations:

1. Get a free account on SAP BTP Trial
Follow the steps from this tutorial: <https://developers.sap.com/tutorials/hcp-create-trial-account.html>

2. Set up SAP Business Application Studio for development

Follow steps from this tutorial: <https://developers.sap.com/tutorials/appstudio-onboarding.html>

3. Request access to DME and applications, such as:
 - Manage Service Registry
 - POD Designer
 - Work Center POD



4. Clone the Git repository

In your browser, go to <https://github.com/SAP-samples/digital-manufacturing-extension-samples>

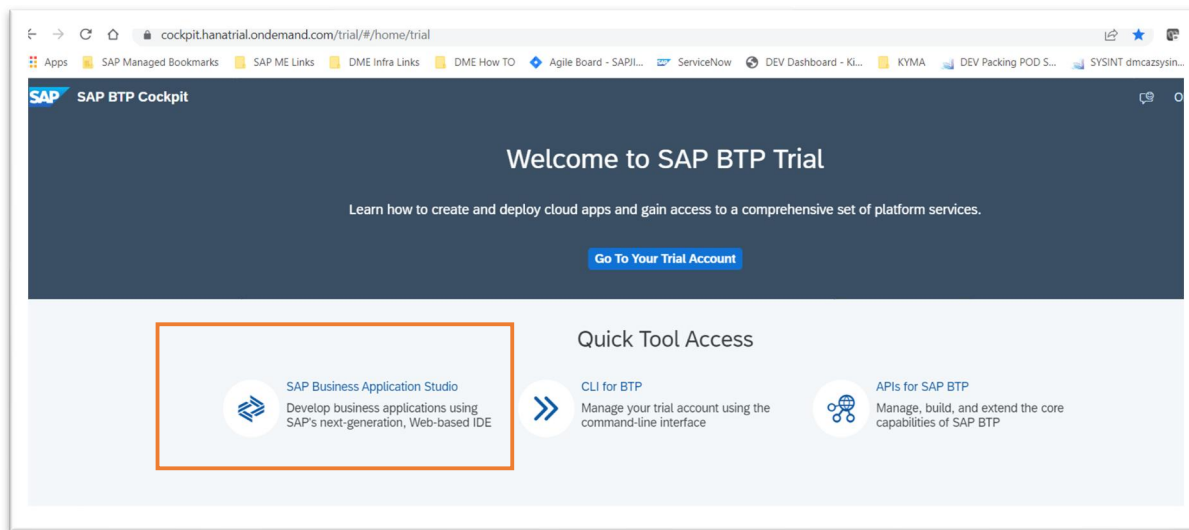
Choose the Code button and choose one of the options to download the code locally or simply run the following command within your CLI at your desired folder location:

`git clone https://github.com/SAP-samples/digital-manufacturing-extension-samples`

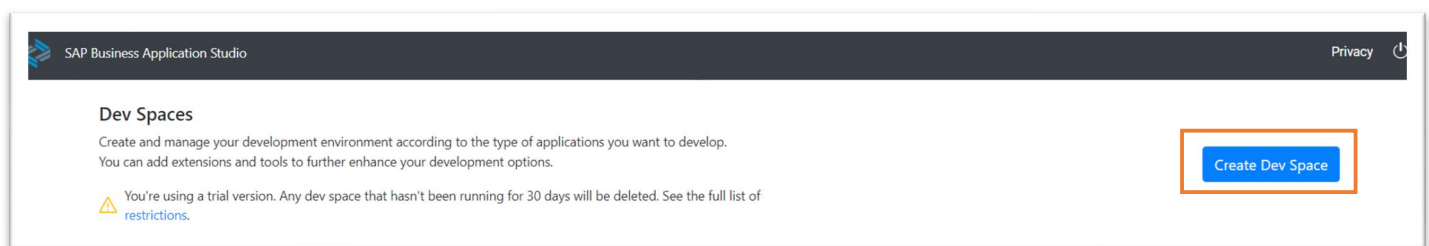
5. Open the DMC_UIExtensions/ExecutionPodPluginTemplate_and_Example directory in your desired editor, it contains two folders:
 - documentation for installation and configuration guide
 - project for the implementation part

Installation Steps

1. Open SAP Business Application Studio.



2. Choose Create Dev Space.



3. At the "Create New Dev Space" screen execute the following steps:

- Enter the POD_Plugins name for your dev space.
- Choose Full Stack Cloud Application as the application type.

By selecting Full Stack Cloud Application your dev space comes with several extensions out-of-the-box that you need to develop applications.

- Choose Create Dev Space.

The Dev Space will then begin starting and the process will take a minute or so as your cloud environment is being created. You see that the status for your dev space will change from **STARTING** to **RUNNING**.

Create a New Dev Space

POD_Plugins ✓

What kind of application do you want to create?

☐ SAP Fiori

☒ Full Stack Cloud Application

☐ SAP HANA Native Application

☐ SAP Mobile Application

Full Stack Cloud Application Dev Space

Build business services and business applications and extend SAP S/4HANA using SAP Cloud or Node.js.

SAP Predefined Extensions

The following extensions are enabled by default.

Addition
Select add



Basic Tools

Allows you to optimize your web development workflow. The extension includes capabilities such as ... [more](#)

☐



CDS Graphical Modeler

Allows you to design SAP core data services models in SAP cloud business application development projects.... [more](#)

☐



CAP Tools

Allows you to develop CAP applications using the CDS command-line and tools. Includes enhanced code an... [more](#)

☐

Please NOTE: In the SAP BTP trial you are limited to only two Dev Spaces and only one can be active at a time.


- Once the Dev Space reaches the green status of **RUNNING**, you can click on the name of the Dev Space and it will load into the editor within your browser.

Dev Spaces

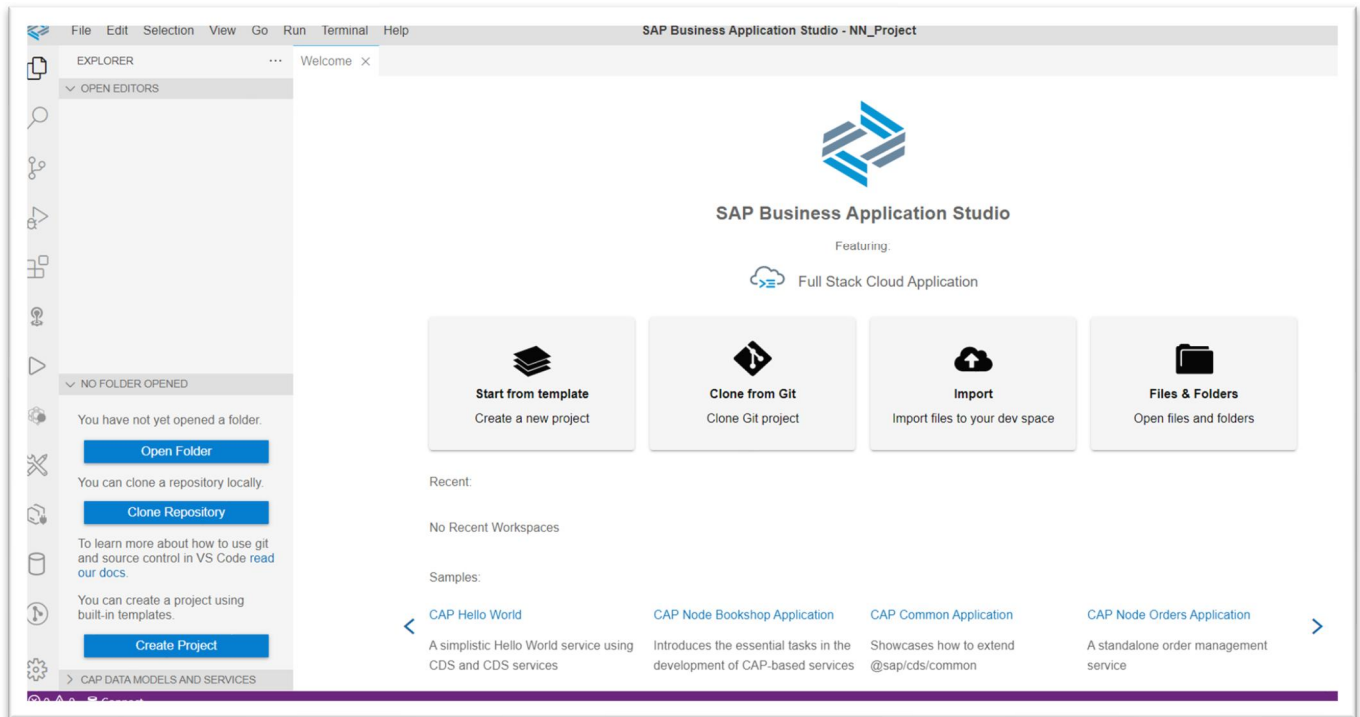
Create and manage your development environment according to the type of applications you want to develop. You can add extensions and tools to further enhance your development options.

You're using a trial version. Any dev space that hasn't been running for 30 days will be deleted. See the full list of [restrictions](#).

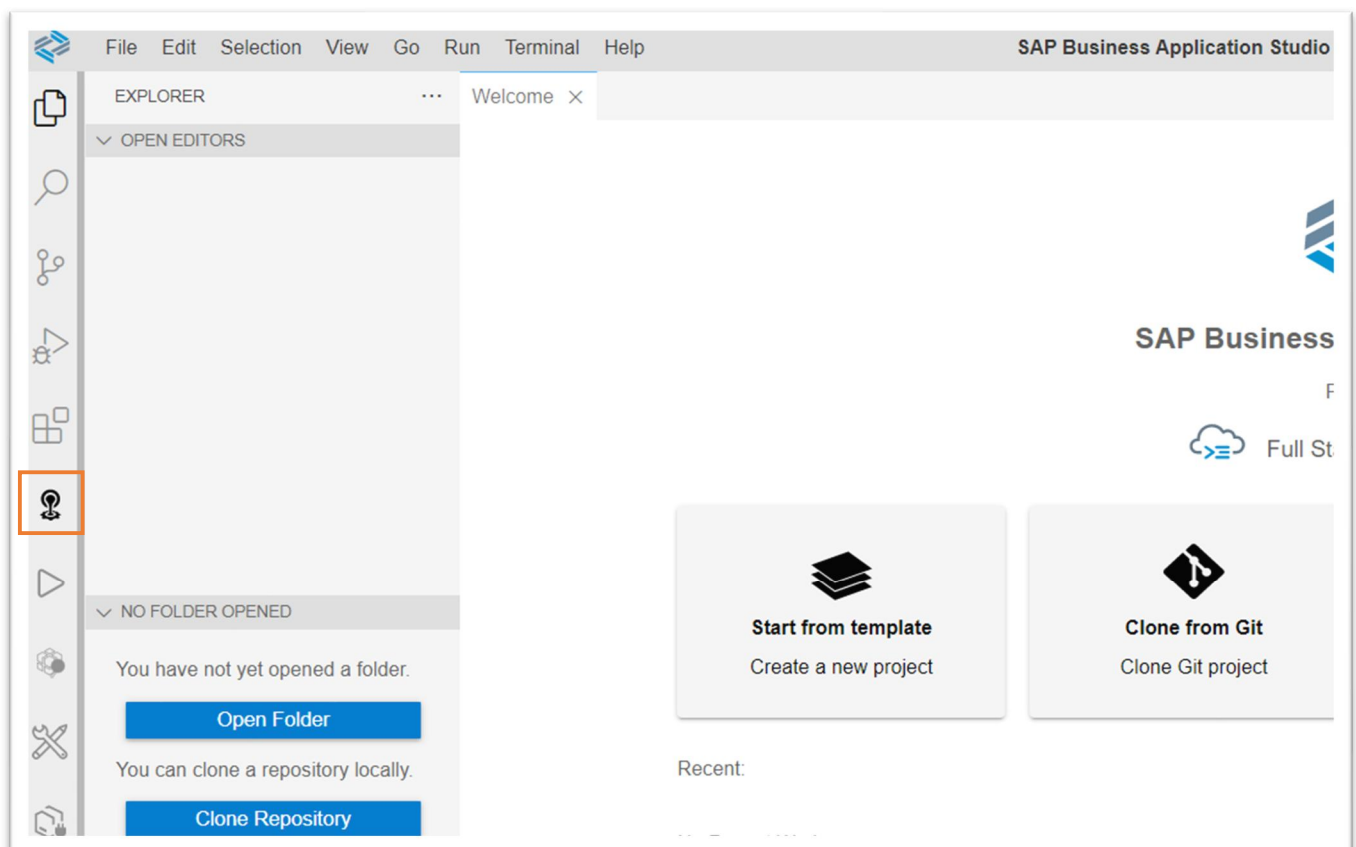
You are allowed a total of 2 dev space: hidden dev space

 <div> POD_Plugins Full Stack Cloud Application </div>	RUNNING	Created On 05/23/2022 1:41 PM	ID ws-kjsnn
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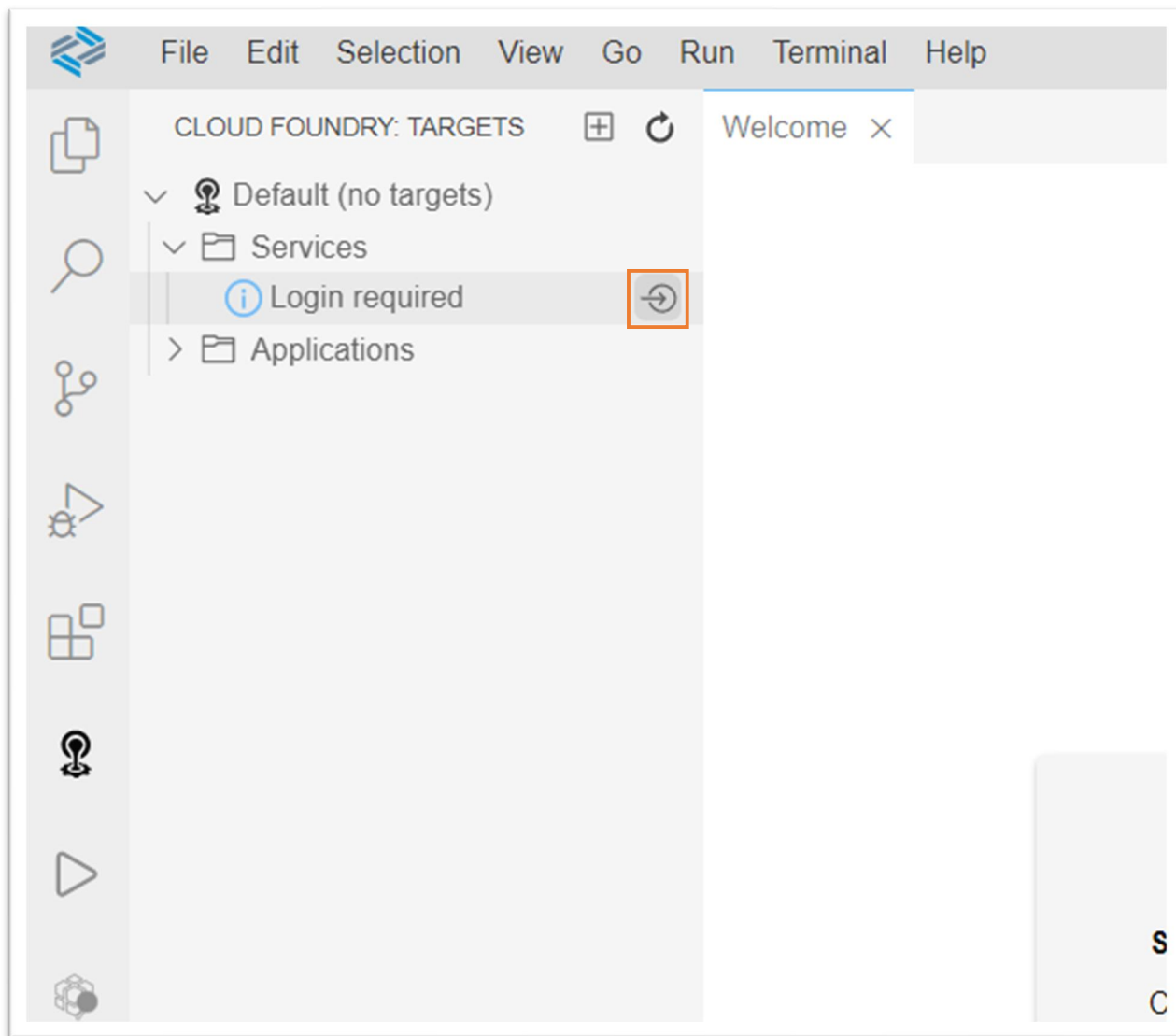
- You'll be redirected to your newly created SAP Business Application Studio Dev Space. Recommend you bookmark this URL so it's easier for you to access this dev space of your SAP Business Application Studio in the future.



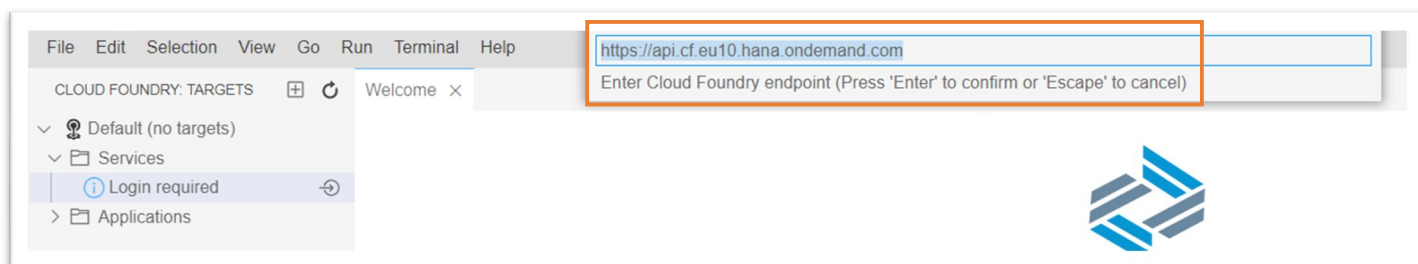
6. On the left side of the Business Application Studio click on the Cloud Foundry targets icon



7. In the Cloud Foundry Targets window, you can expand either Service or Applications and then click on the Logon icon to continue the configuration process



8. The command window will then open at the top of the SAP Business Application Studio. The first input will prompt you for the Cloud Foundry endpoint



The default value proposed is likely the correct value, but if you need to confirm; the value can be found in the SAP BTP cockpit at the Subaccount level.

SAP BTP Cockpit

Trial Home / 2086a3abtrial / trial

Subaccount: trial - Overview

General Cloud Foundry Environment Kyma Environment Entitlements

Created By
Created On: 31 Aug 2021, 14:58:52 (GMT+03:00)
Modified On: 11 Oct 2021, 14:22:18 (GMT+03:00)

Cloud Foundry Environment

Org Name: 2086a3abtrial
API Endpoint: <https://api.cf.eu10.hana.ondemand.com>
Org ID: e39dcca3-6bb8-487e-a98f-5162bf095750
[Manage environment instance](#)
[Disable Cloud Foundry](#)

Spaces (1)

Name	Applications
dev	1

Press Enter to confirm your input of the Cloud Foundry endpoint.

- The next input field will ask you for the email address you used to create your SAP BTP trial account

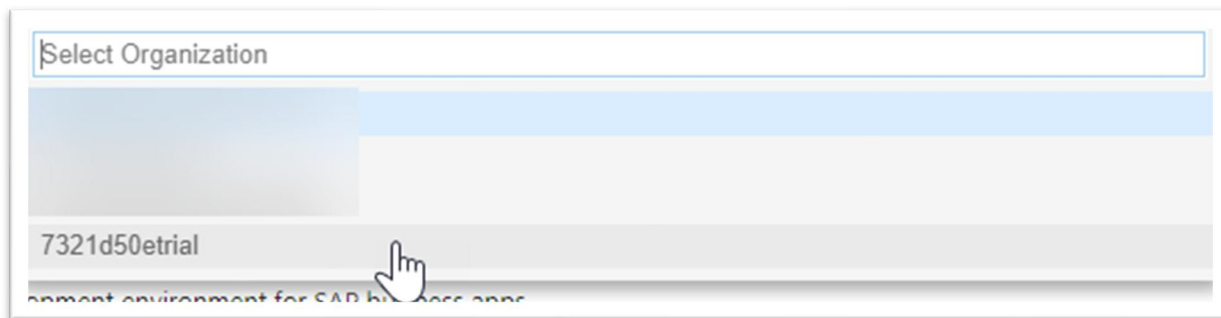
al my.email@company.com

Enter e-mail address (Press 'Enter' to confirm your input or 'Escape' to cancel)

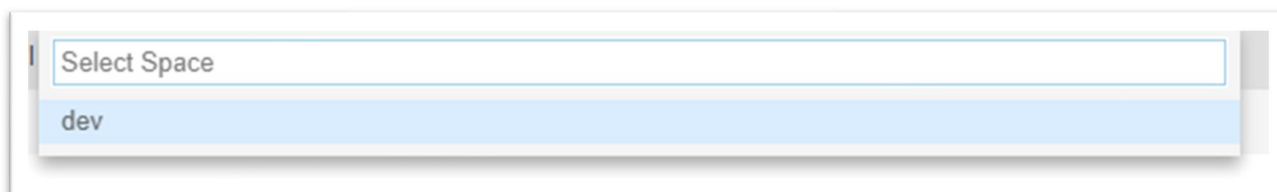
- The next input will ask you for your SAP BTP trial account password

Enter password (Press 'Enter' to confirm your input or 'Escape' to cancel)

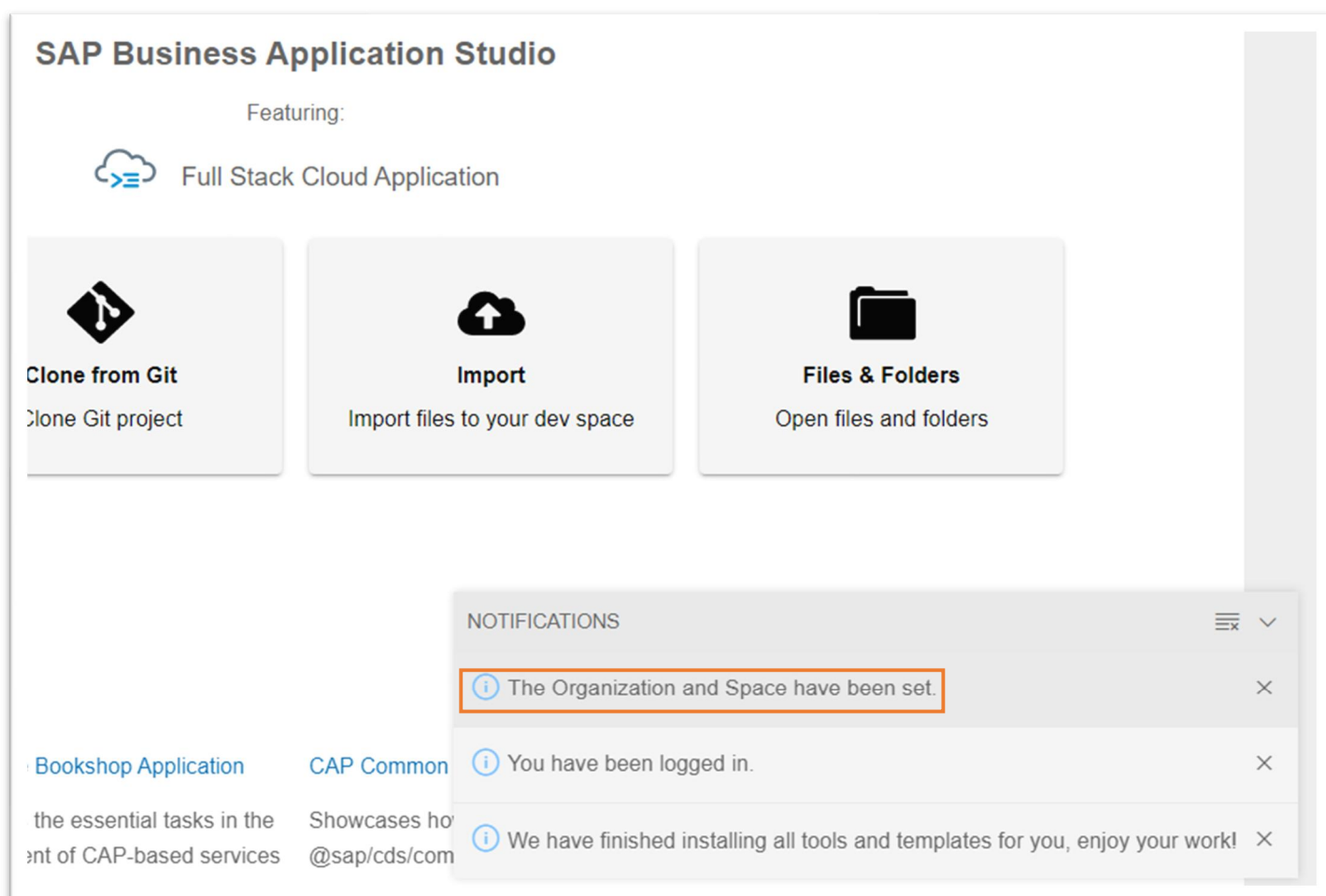
- The next input will ask you for your Organization. In most situations, you will have a single choice. But like the API endpoint earlier, if you need to confirm the correct value it will be displayed in the top navigation of the SAP BTP cockpit



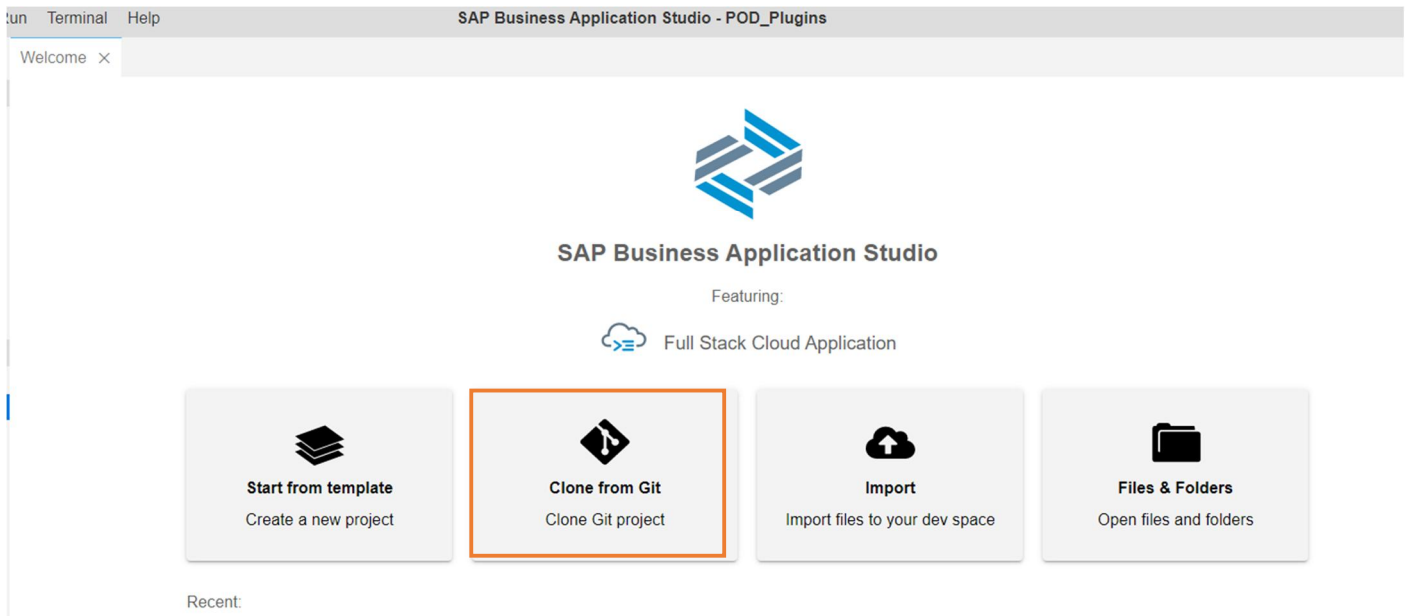
12. The final input will ask you for your Space. If you choose the endpoint API and Organization correctly, then you should have a single option of dev



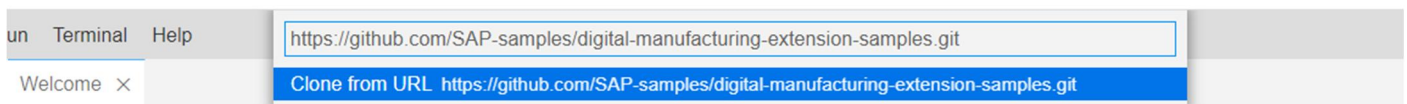
13. Upon completion of all the inputs, you should see that the Organization and Space have been set.



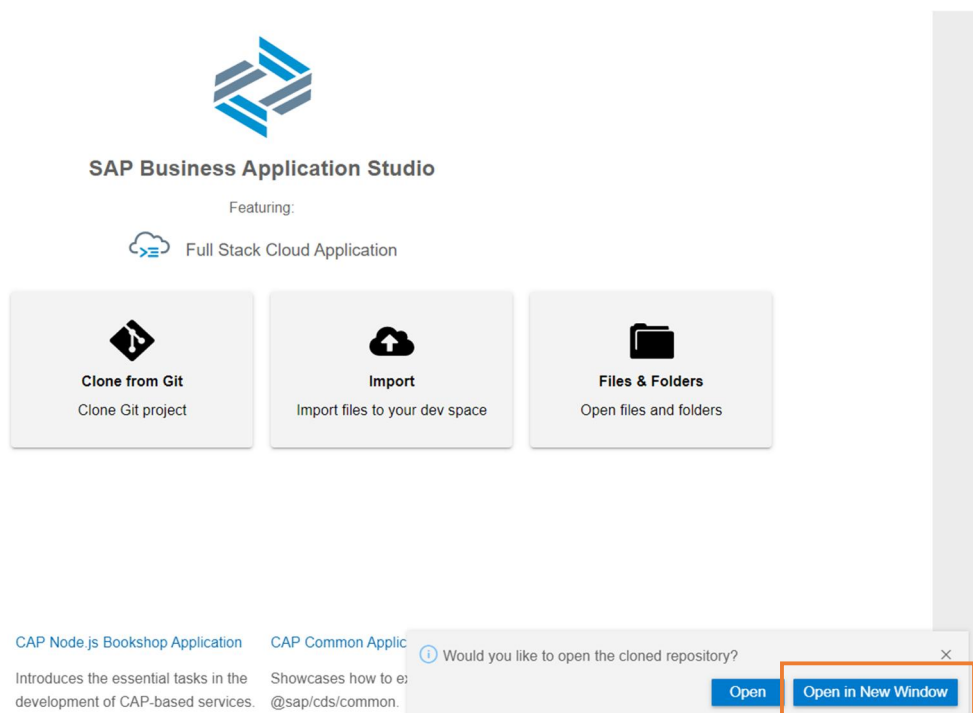
14. The next step is to add project with a POD Execution Plugin example and POD Execution Plugin Templates to workspace. From the SAP Business Application Studio Welcome page, click Clone from Git



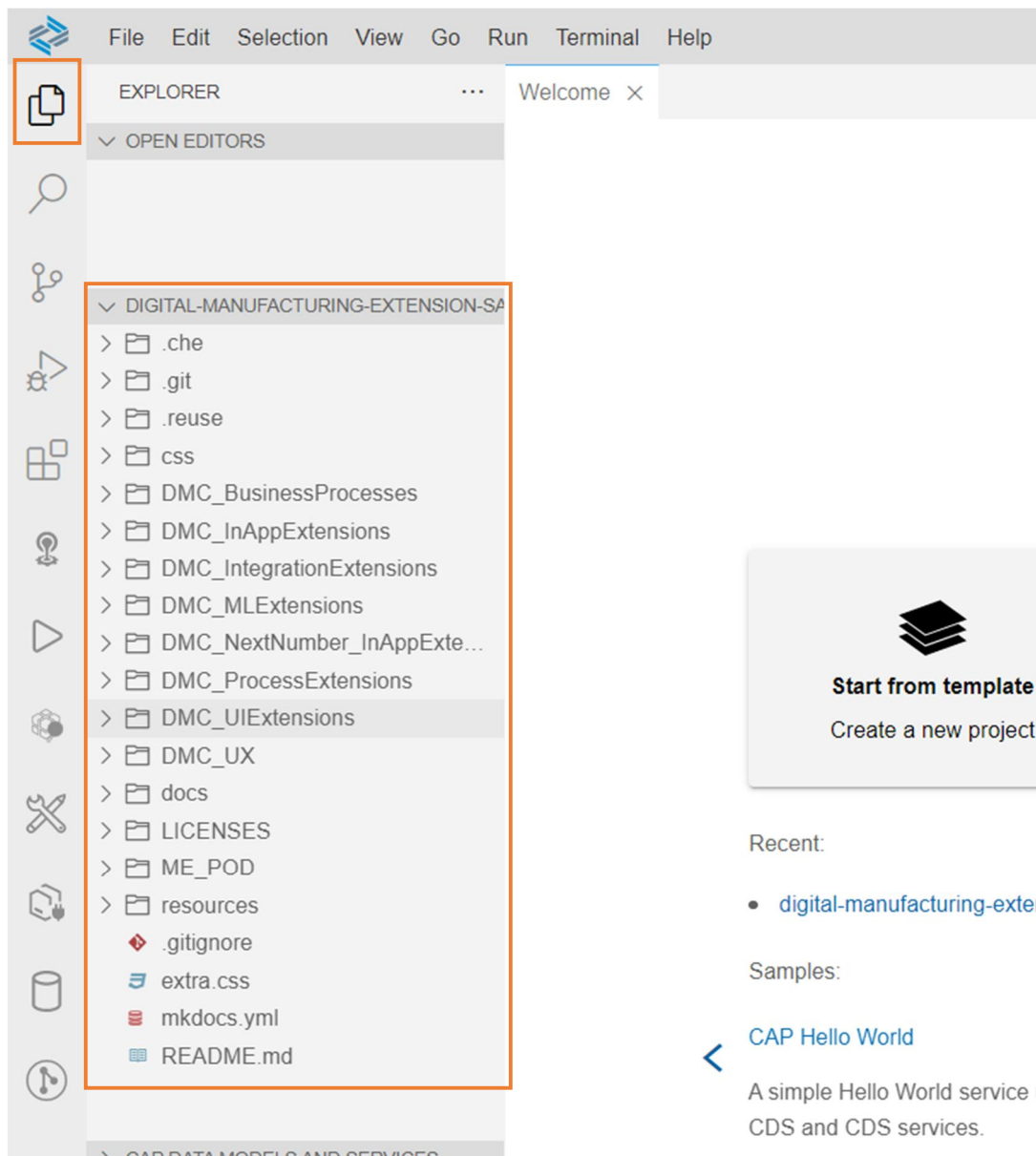
15. Specify URL in input field: <https://github.com/SAP-samples/digital-manufacturing-extension-samples.git>



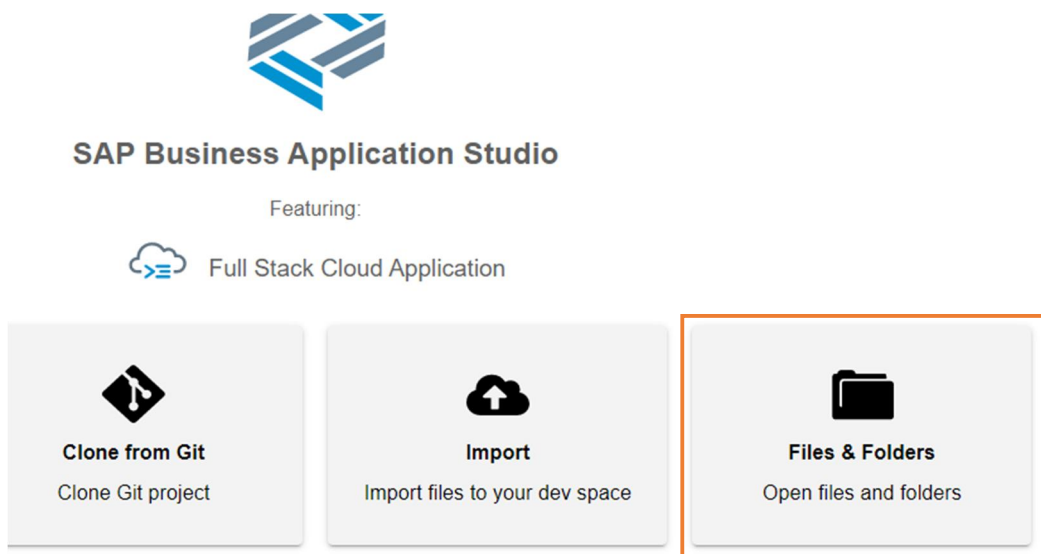
Expected result that repository was successfully cloned, and you should choose Open in New Window



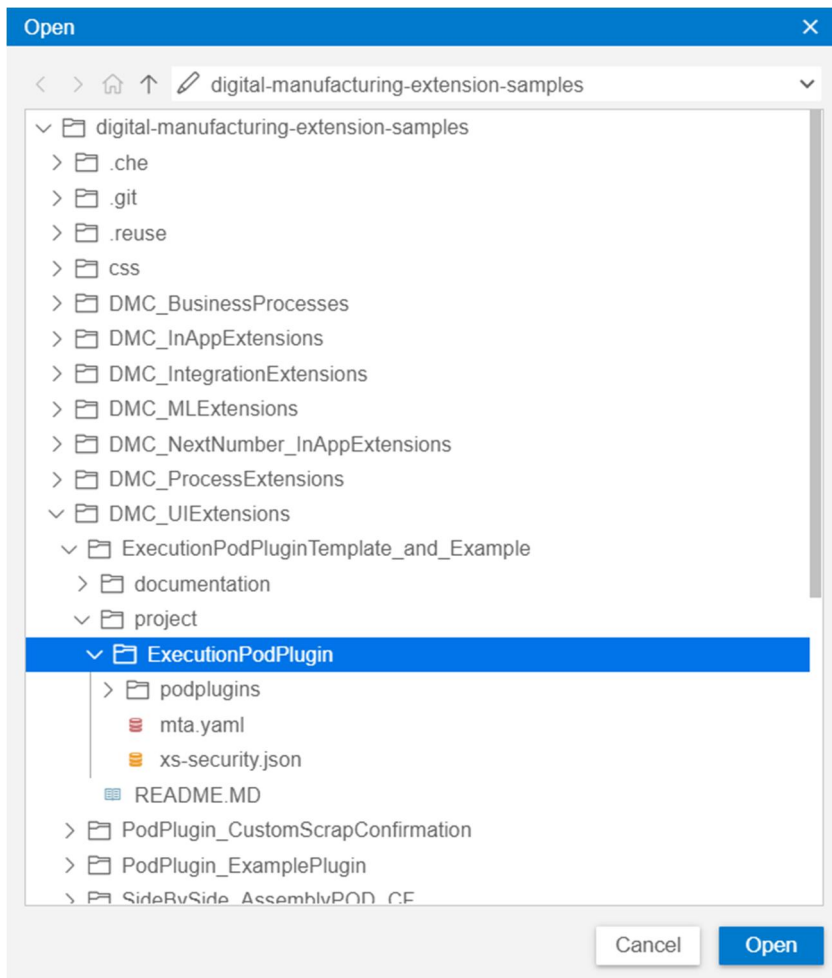
Explorer view shows project with content as below



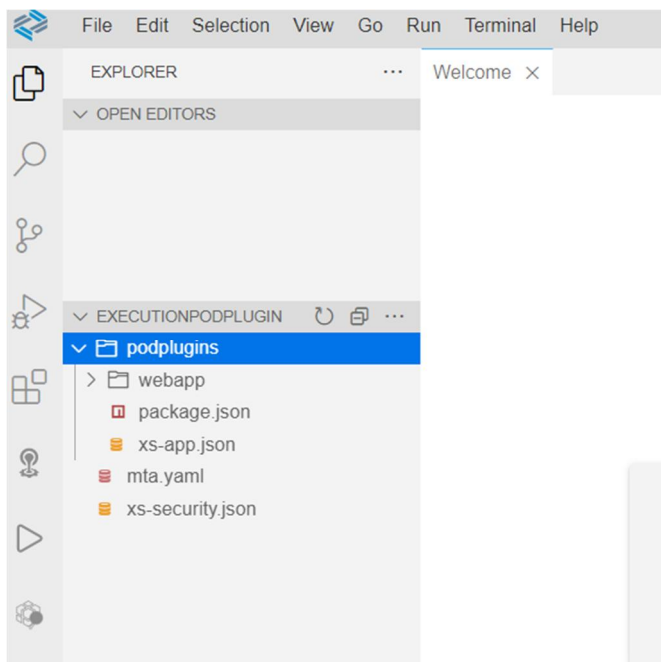
16. We should switch to needed project by choosing Files & Folders in Welcome screen



17. Navigate to path below, choose ExecutionPodPlugin folder and click Open button



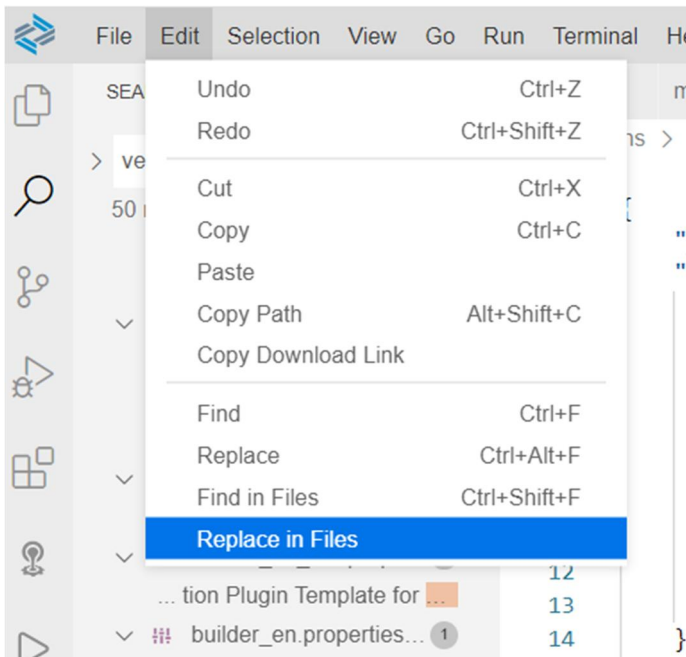
You will get such project structure



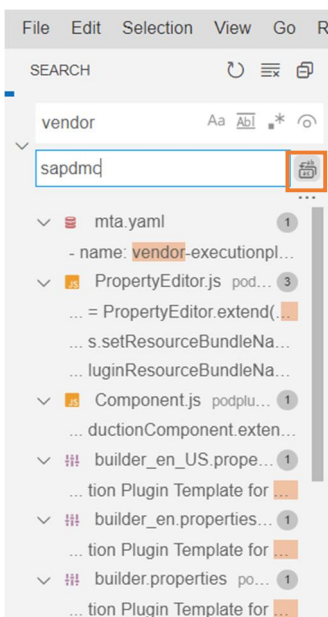
18. We should replace “vendor” word in project to actual vendor name value

Information: Vendor is a namespace qualifier, this ensures that artifacts such as Java classes and the archives in which they are packaged are globally unique.

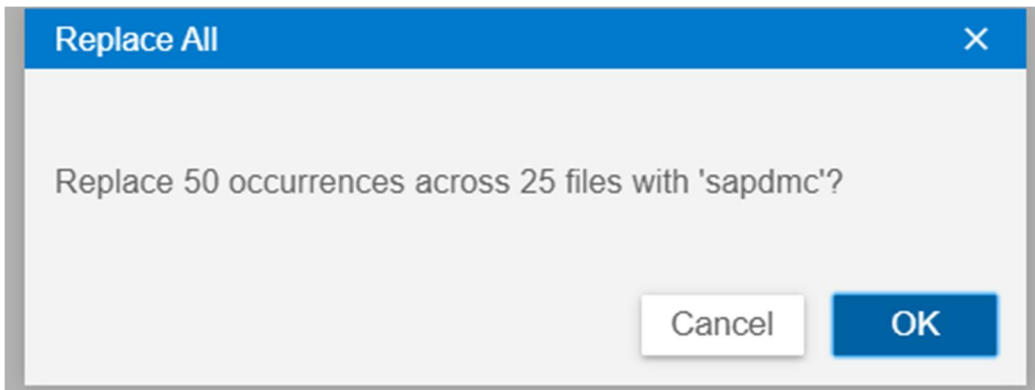
Choose Edit à Replace in Files from menu



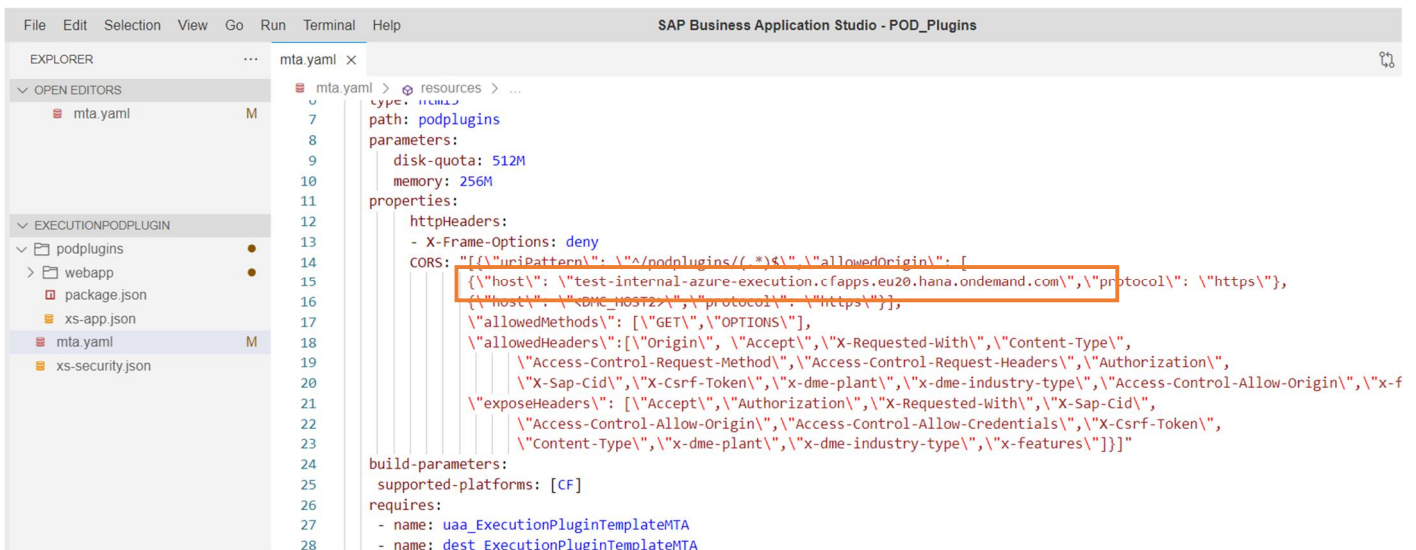
And replace vendor to your actual vendor name value. In this document we used sapdmc for vendor name. Choose Replace All icon.



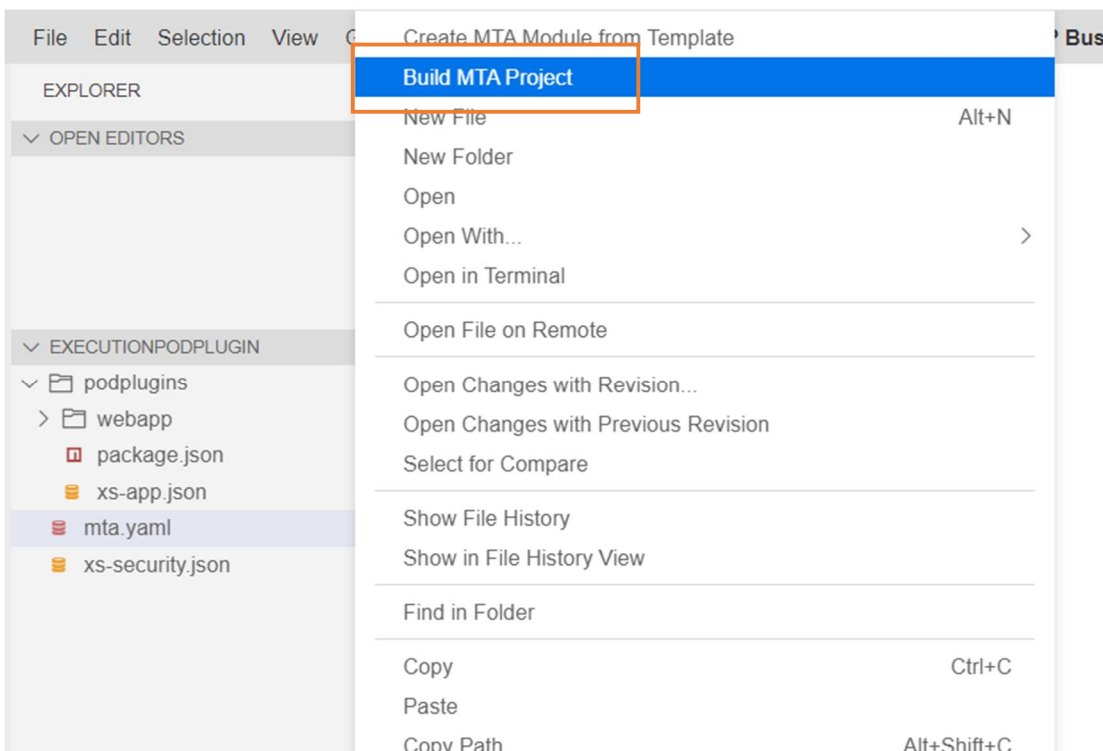
It should replace occurrences in all files. Choose OK.



19. Open mta.yaml file and replace `<DMC_HOST1>` with the host name where POD is located, for example



20. Right-click the mta.yaml file and choose Build MTA Project.

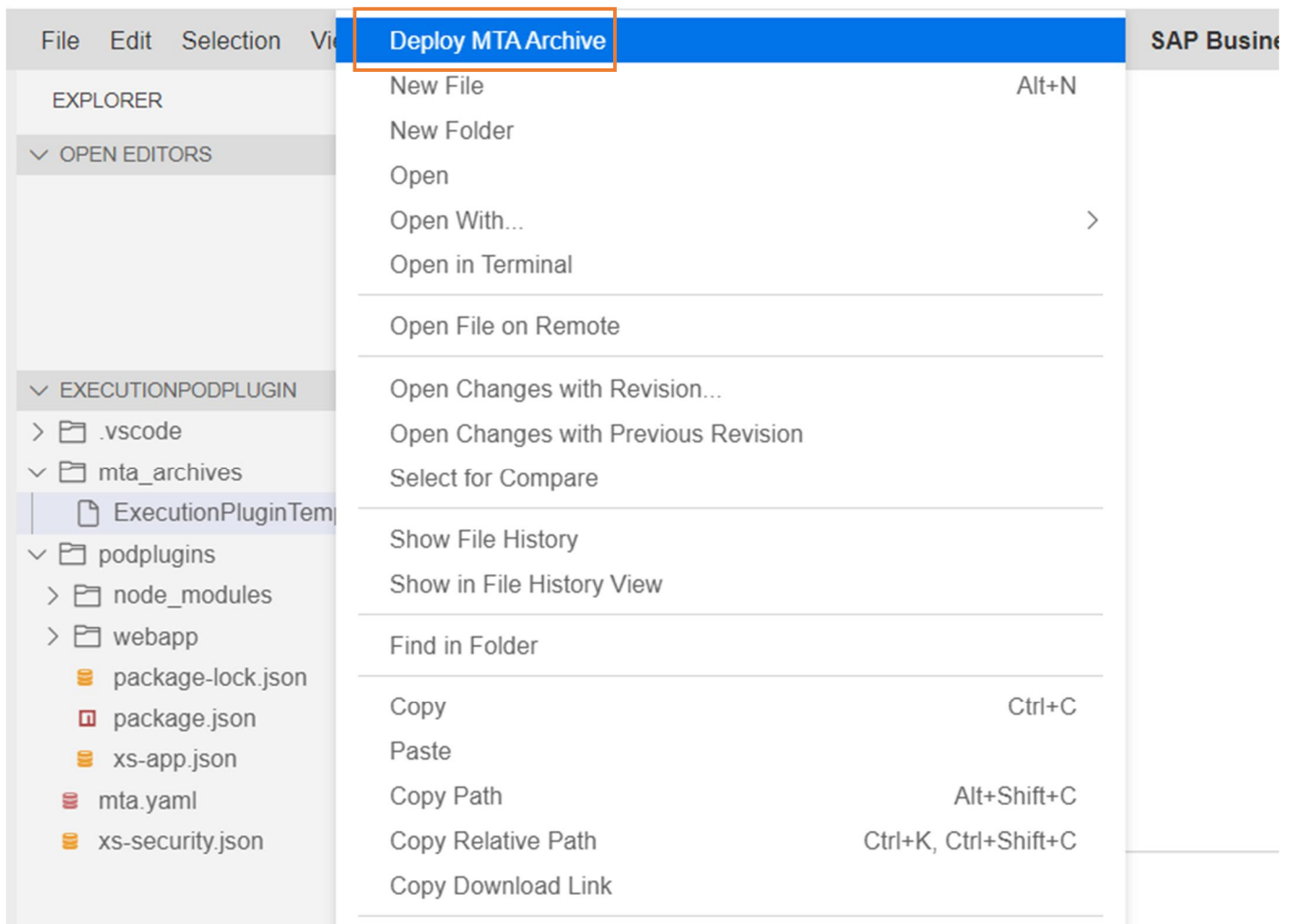


As a result of this step two new folders are created:

- mta_archives folder is created containing the new generated ExecutionPluginTemplateMTA_0.0.1.mtar file
- node_modules folder is created with all required dependencies



21. Right-click on the generated ExecutionPluginTemplateMTA_0.0.1.mtar file and choose Deploy MTA Archive.



After deployment is done, your application should be available in your Cloud Foundry space. To access your application, go to your space in the SAP Cloud Platform cockpit and select Applications from the side menu.

The screenshot shows the SAP BTP Cockpit interface. On the left is a navigation menu with 'Applications' selected. The main area displays the 'Space: dev - Applications' page. A table lists applications in the space:

Requested State	Name	Instances	Disk Quota	Memory
Stopped	batch-next-number	0/1	1024 MB	1024 MB
Started	sapdmc-executionplugin	1/1	512 MB	256 MB

22. Choose a sapdmc-executionplugin application to see details and status.

The application should have **Started** status.

The screenshot shows the 'Application: sapdmc-executionplugin - Overview' page. At the top, the breadcrumb navigation includes 'Trial Home', '2086a3abtrial', 'trial', 'dev', and 'sapdmc-executionplugin'. The 'Started' status is highlighted with a red box. Below the status are buttons for 'Restart', 'Start', 'Stop', '+ Instance', '- Instance', and 'Delete'. The 'Application Routes' section displays the URL: <https://2086a3abtrial-dev-sapdmc-executionplugin.cfapps.eu10.hana.ondemand.com>.

Installation steps are completed! Go to the Configuration Steps section!

Configuration Steps

1. Go to your space in the SAP Cloud Platform cockpit and select Applications from the side menu
2. Choose the sapdmc-executionplugin application

Trial Home / 2086a3abtrial / trial / dev

Space: dev - Applications

All: 2

[Deploy Application](#)

Requested State	Name	Instances	Disk Quota	Memory	Actions
Stopped	batch-next-number	0/1	1024 MB	1024 MB	▶ ⏸ 🗑
Started	sapdmc-executionplugin	1/1	512 MB	256 MB	▶ ⏸ 🗑

3. Click on Application Routes URL to verify that the application was deployed

Trial Home / 2086a3abtrial / trial / dev / sapdmc-executionplugin

Application: sapdmc-executionplugin - Overview

Started

[Restart](#) [Start](#) [Stop](#) [+ Instance](#) [- Instance](#) [Delete](#)

Application Routes

<https://2086a3abtrial-dev-sapdmc-executionplugin.cfapps.eu10.hana.ondemand.com>

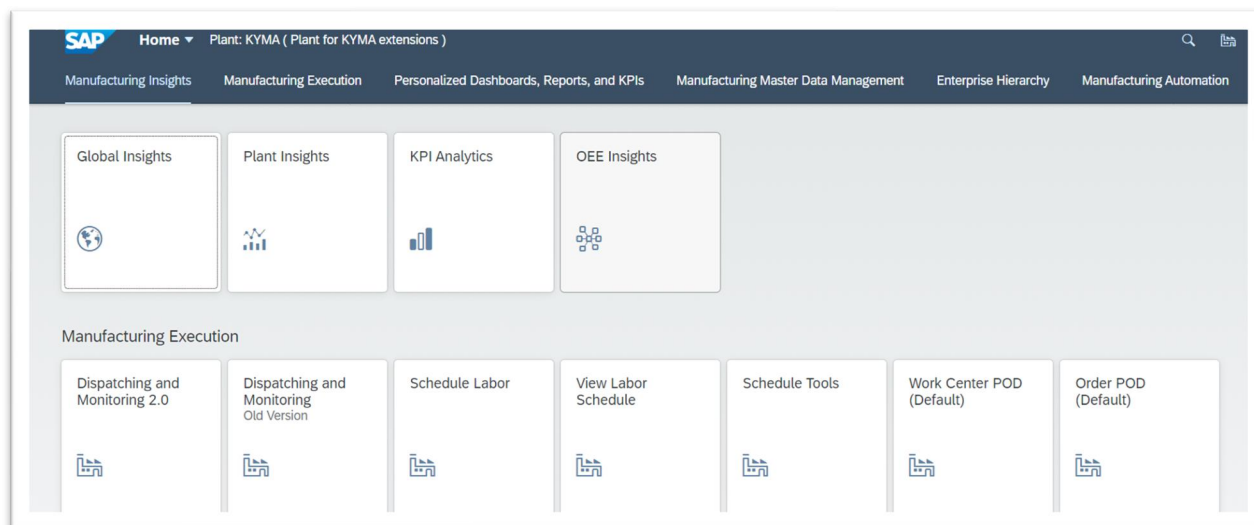
Here is the result of successful deployment to Cloud Foundry.

Template for Execution Plugin

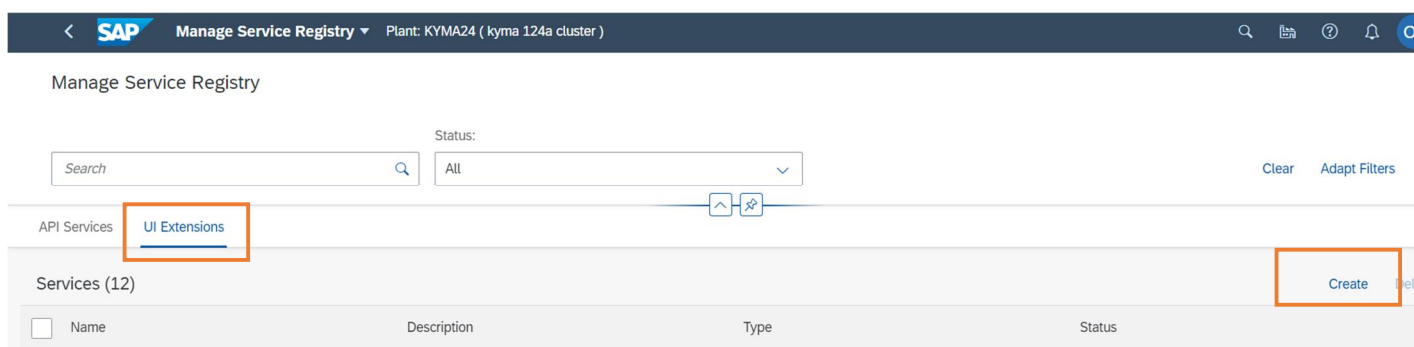
Template for Execution Plugin

<h3>Example for Execution Plugin</h3> <p>This plugin demonstrates how to implement an Execution type plugin. The Property Editor provides a value help button to allow selecting an Action Button for Start and Complete which is to be executed by this plugin. A switch describes whether this plugin will run synchronously or asynchronously. When running in asynchronous mode, the plugin must tell the POD framework when it is done running. In synchronous mode, the plugin is done upon return from the execute() function. Operation filter controls if SFC should be processed at specific operation. Plugin business logic assumes that only one SFC is selected.</p>	<h3>Execution Plugin Template</h3> <p>This plugin is a template for POD Execution Plugin implementation. Implement business logic inside execute() method.</p>	<h3>Asynch Execution Plugin Template</h3> <p>This plugin is a template for Asynch POD Execution Plugin implementation. Implement business logic inside execute() method.</p>
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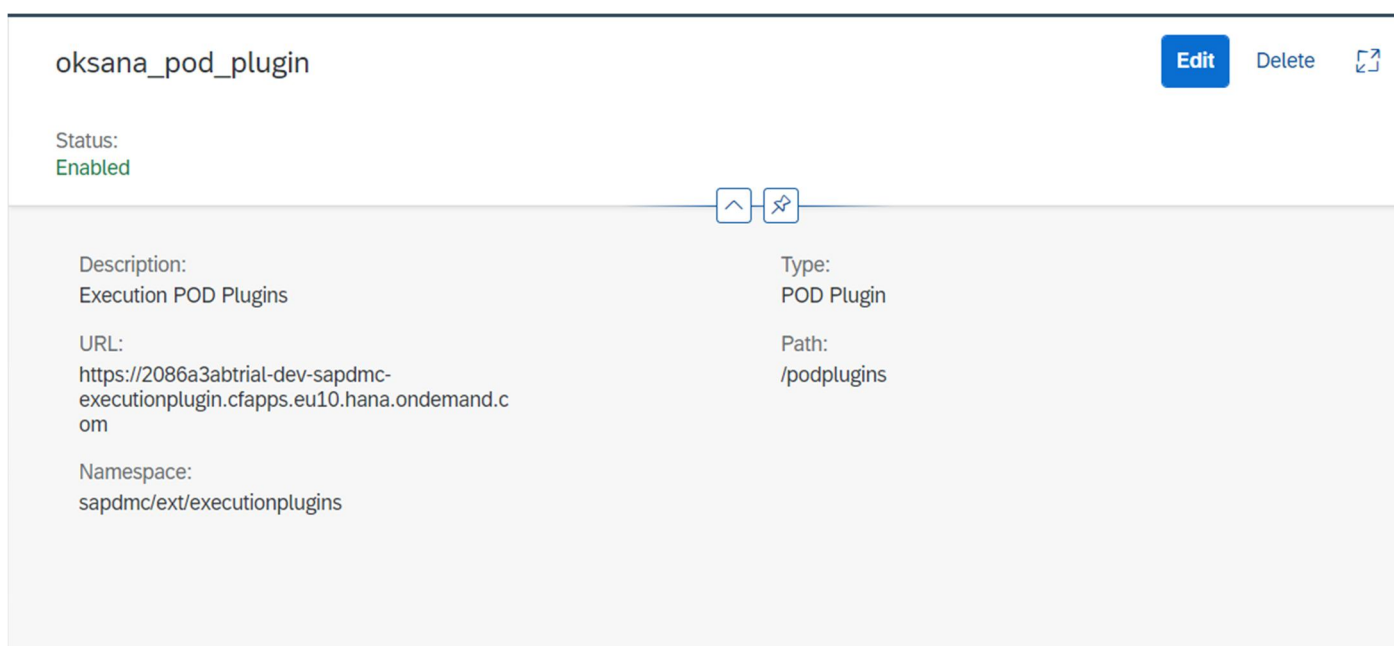
4. Copy application route URL as it will be used in Manage Service Registry application in next steps
5. Login to DMC



6. Open the Manage Service Registry application
7. Select UI Extensions tab and choose Create button



8. Define new UI Extension with the following settings as below



For URL field: use application route URL from "Application Routes" in BTP Cockpit

For Path field: /podplugins

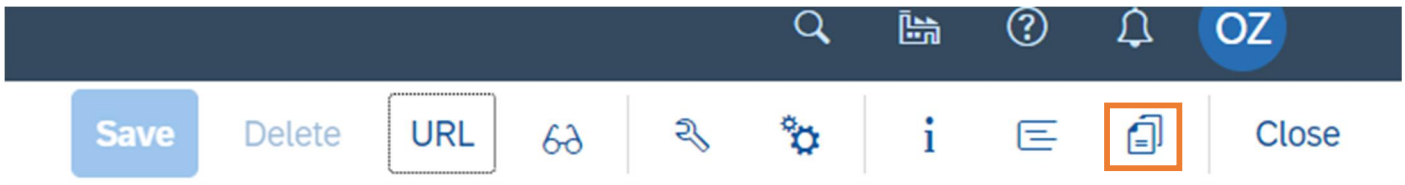
For Namespace: **vendor**/ext/executionplugins

Note: replace "vendor" for Namespace with vendor value you used to "find and replace all" in SAP Business Application Studio

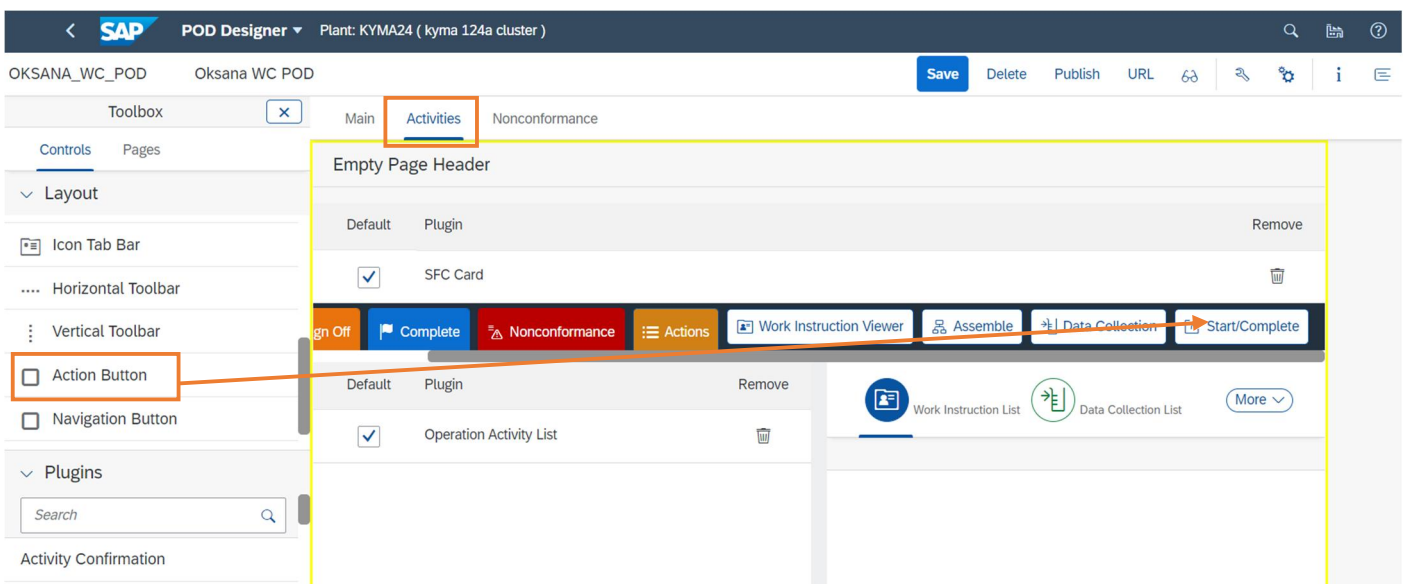
9. Choose Create button and verify that the service was created with correct settings

10. Open POD Designer application and choose DEFAULT_WC_POD POD name

11. Create a copy of the POD



12. Drag and drop Action Button to Activities panel. Click right-mouse button on new Action button and choose "Configuration" option



13. Define Text, icon and click on Assign Actions button

Configuration

✕

Text:

Start/Complete

Tooltip:

Icon:

sap-icon://action

Hotkey:

None

Width:

Show Text:

ON

Visible:

ON

Assign Actions:

Assign Actions

Configurable:

14. Click on Add button to add action for "Execution Plugin for sapdmc" and choose Create button

Add Action

Type:

Plugin

Type Definition: *

Execution Plugin for sapdmc

Create


Cancel

15. Click on Configuration icon and define setting for plugin execution.

The current configuration means that SFC will be started by Start action button and Completed by Complete action button at Operations: OPER1 and OPER2.

Configure Action Button

Actions

Type	Type Definition	Configuration
Plugin	Execution Plugin for vendor	

Configuration

Action Button ID for Start:

Start

Action Button ID for Complete:

Complete

Synchronous Execution:

ON

Operation Filter Criteria:

Operation is one of

Operation :

OPER1,OPER2

Close

16. Save new POD configuration

17. Open POD with URL that you just configured

18. Choose new SFC and process to activities screen. There you should see Start/Complete button

19. Click button – SFC is started at OPER1. Toast messages should show appropriate messages about progress.

20. Click button again – SFC is completed at OPER1 and processed to the next operation. Toast messages should show appropriate messages about progress.

<

SAP

Oksana WC POD

Plant: KYMA24 (kyma 124a cluster)

Main / Activities

KYMA2419 SFC

Status:

Work Center:

Resource:

SFC Quantity:

Order:

Material:

Material Description:

WC1

RES1

1

ORDER1

M1_R1/A

M1_R1


Sign Off

Nonconformance

Actions

Start/Complete

Operation Activity List (2)

	Operation Activity/Step ID	Activity Description	Status Icon
<input checked="" type="checkbox"/>	OPER1/10	OPER1	
<input type="checkbox"/>	OPER2/20	OPER1	

Work Instruction List

Data Collection L

Work Instruction List (0)

Work Instruction/Version

Configuration Steps are completed!