

Purchase Order Approval Process

WORKFLOW DEMO APPLICATION

AUGUST 14

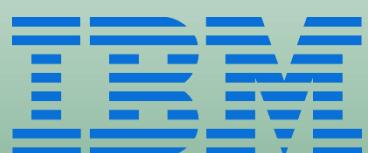
IBM

Authored by:

Mini Shaw

Abhimanyu Das

Gaurav Modgil



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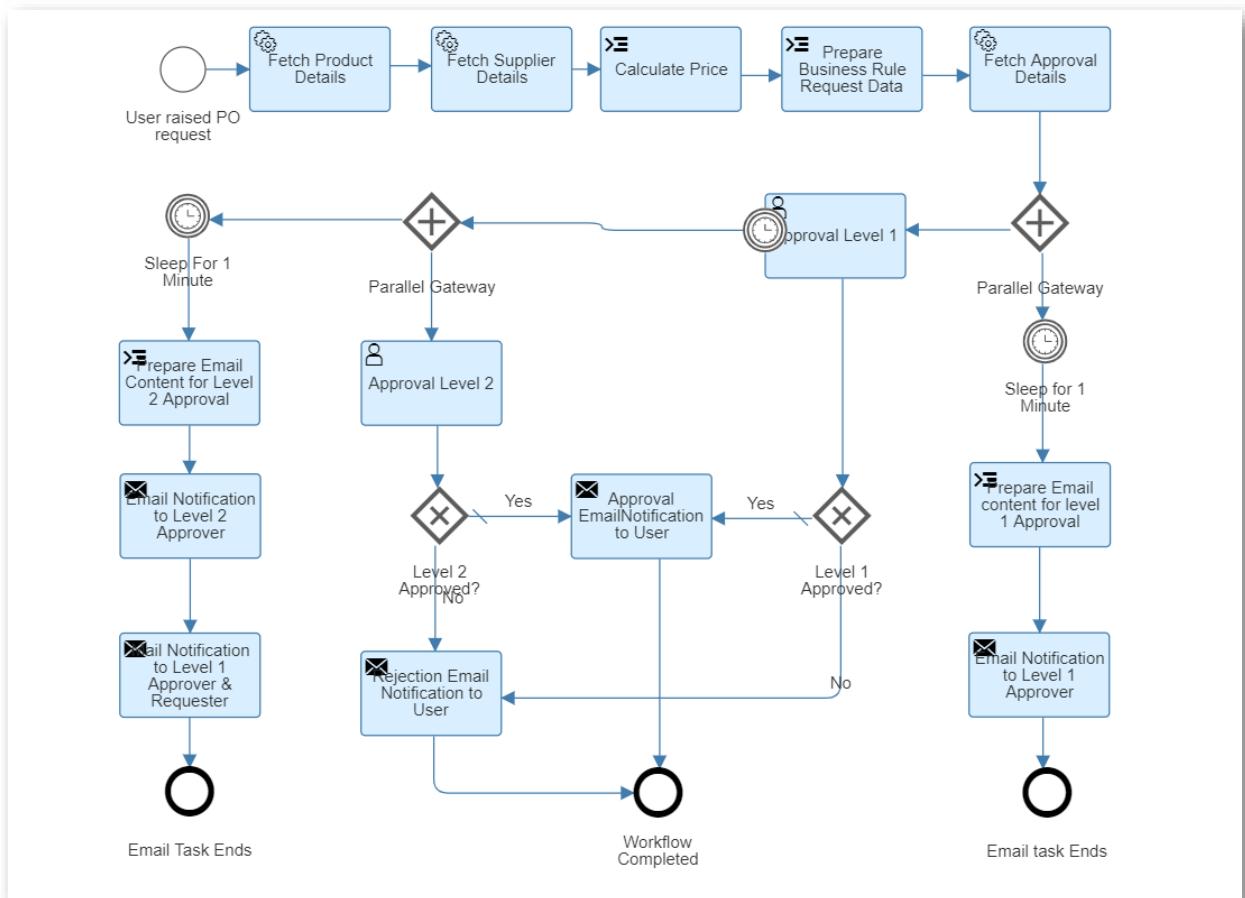
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[A] Use Case: Scenario

1. User fills the product request form using 'Request Product' application providing Product ID, Quantity and Comments. Workflow is instantiated once user submits the Request.
2. Once Workflow is started, Northwind Database is Queried for the Product and Price, Supplier details are fetched.
3. The level 1 and level 2 approver details are fetched from Business Rules [via REST call].
4. Level 1 manager is sent a mail notification about the User request with the Total Purchase Order Cost.
5. Request Awaits approval in the First Level Managers Inbox until:
 - Manager Approves/Rejects the Request
 - After a Specific Wait Period, The Task is re-routed to the second level Manager.
5. If Either of the managers Rejects the Request, Mail is sent to the Requestor notifying that the request has been rejected.
6. Approval mail is sent to the user with Approval Details as well as Details of the Supplier Like Address/Contact Details etc.

[B] Workflow Diagram



[C] Prerequisites

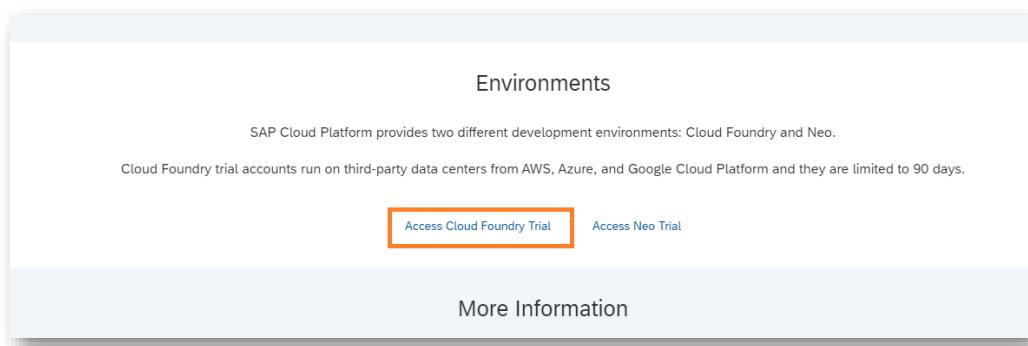
Get a Free Trial Account on SAP Cloud Platform. You can create your account by visiting <https://cloudplatform.sap.com/try.html>.

 <https://developers.sap.com/tutorials/hcp-create-trial-account.html>

[D] Prepare to Create Workflows in SAP Cloud Platform (Cloud Foundry)

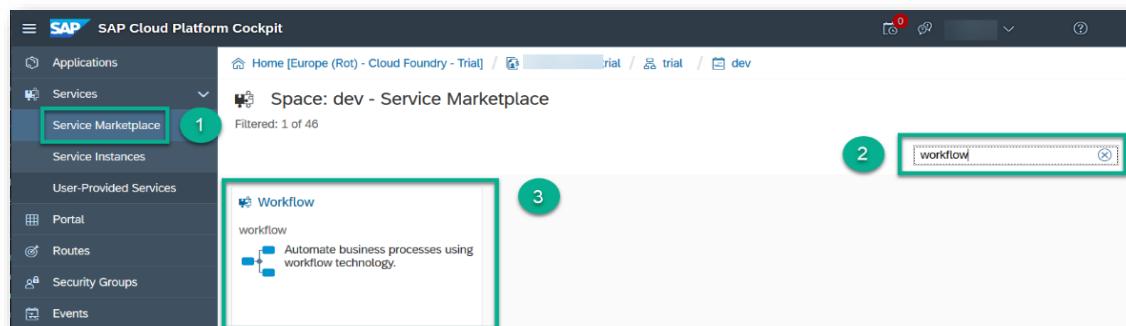
Step 1: Open the SAP Cloud Platform cockpit

1. In your Web browser, open the [SAP Cloud Platform](#) cockpit. If you do not have a trial account, see Prerequisites.
2. Scroll down to **Environments** and choose **Access Cloud Foundry Trial**.



Step 2: Add a workflow instance

1. Go to your trial subaccount. If you have just created your trial account, choose trial from the breadcrumbs.
2. Choose **Spaces** from the left-hand navigation, and then choose **dev**.
3. Choose **Services | Service Marketplace** from the left-hand navigation, and search for **workflow**
4. Choose the workflow service



5. Choose **Instances** from the left-hand navigation, then choose **New Instance**.

The screenshot shows the SAP Cloud Platform Cockpit interface. On the left, there's a dark sidebar with 'Overview', 'Instances' (highlighted with a green circle labeled '1'), 'New Instance' (highlighted with a green circle labeled '2'), 'Useful Links', and 'Legal Information'. The main area is titled 'Service: Workflow - Instances' and shows a table with one row: 'Name' (empty), 'Plan' (No instances), 'Last Operation' (empty), and 'Actions' (empty). There's also a 'Search' input field.

6. In the wizard that comes up, leave the data as is and proceed by choosing **Next**. On the last page, enter **my-workflow-instance** as the instance name and choose **Finish**.

The screenshot shows a 'Create Instance' wizard. It has five steps: 'Choose Service Plan', 'Specify Parameters (Optional)', 'Assign Application (Optional)', 'Confirm', and 'Actions'. In the 'Confirm' step, the 'Instance Name' field contains 'my-workflow-instance' (highlighted with a green circle labeled '1'). At the bottom right, there are buttons for 'Previous', 'Finish' (highlighted with a green circle labeled '2'), and 'Cancel'.

Step 3: Create role collection

1. Go back to your trial subaccount by choosing **trial** from the breadcrumbs.
2. From the left-hand navigation, choose **Security | Role Collections**, then choose to click on plus (+) icon.

The screenshot shows the 'Role Collections' screen. The left sidebar has 'Destinations' with 'Security' selected. Under 'Security', 'Role Collections' is highlighted. The main area shows a table with one row: 'Business_Application_Studio_Administrator'. The 'Name' column is highlighted with a green circle labeled '1'. The 'Actions' column contains a '+' icon, which is highlighted with a green circle labeled '2'.

3. Enter the name for your role collection (e.g. **wfs**), then choose **Create**.

4. After the role collection is created, click its name, and choose **Edit** to Add Role.

Role Collection: wfs - Overview

Description:

Roles (0) Users (0) User Groups (0) Description

Role Name	Role Template	Application Identifier	Actions
No Roles			

Search

Add a role

5. In the wizard that comes up, select following roles one by one.

- WorkflowAdmin
- WorkflowDeveloper
- WorkflowInitiator
- WorkflowParticipant
- WorkflowViewer
- WorkflowContextViewer

Role Collection: wfs - Overview

Description:

Roles (6) Users (0) User Groups (0)

Role Name	Role Template	Application Identifier
WorkflowAdmin	WorkflowAdmin	workflow/b10150 >
WorkflowContextViewer	WorkflowContextViewer	workflow/b10150 >
WorkflowDeveloper	WorkflowDeveloper	workflow/b10150 >
WorkflowInitiator	WorkflowInitiator	workflow/b10150 >
WorkflowParticipant	WorkflowParticipant	workflow/b10150 >
WorkflowViewer	WorkflowViewer	workflow/b10150 >

Search

Before adding a new role, you need to save the unsaved changes and again click on Edit button.

Step 4: Assign role collection

1. Go back to your trial subaccount by choosing the **trial** from the breadcrumbs.
2. From the left-hand navigation, choose **Security | Trust Configuration**, then click **sap.default**

The screenshot shows the SAP Cloud Platform Cockpit interface. On the left, the navigation menu is expanded to show 'Security' and 'Role Collections'. Under 'Role Collections', 'Trust Configuration' is selected and highlighted with a red box. A circled '1' is next to this selection. To the right, the main content area displays 'Subaccount: trial - Trust Configuration' with 'All: 1'. Below this, there are two buttons: 'New Trust Configuration' and 'SAML Metadata'. A search bar is also present. The table lists one entry: 'Default' (Status: Active, Name: sap.default, Description: sap.default, Origin Key: sap.default, Identity provider is available for user logon: checked). A circled '2' is next to the 'sap.default' name. At the bottom, a note says 'Learn more about how to configure trust and how to assign role collections.'

3. Enter your email address, then choose **Show Assignments**.

The screenshot shows the 'Role Collection Assignment' dialog for the 'sap.default' role collection. It has fields for 'E-Mail Address' (with a red box around it) and buttons for 'Show Assignments' (circled with a green arrow) and 'Assign Role Collection'. A confirmation message box is overlaid: 'Confirmation' with the text 'To see and assign role collections, you must first add [REDACTED] as a user of identity provider SAP ID Service.' It has 'Add User' and 'Cancel' buttons. A circled '1' is above the 'E-Mail Address' field.

4. Choose **Add User**.
5. Choose **Assign Role Collection** and select the **wfs** collection that you created before. Then choose **Assign Role Collection** again.

The screenshot shows the 'Assign Role Collection' dialog for the 'sap.default' role collection. It has a 'Role Collection' dropdown set to 'wfs' (circled with a green arrow) and buttons for 'Assign Role Collection' (circled with a green arrow) and 'Cancel'. A circled '1' is above the 'Role Collection' dropdown. A circled '2' is below the 'Assign Role Collection' button.

Step 5: Connect SAP Cloud Platform to Northwind OData Service

1. Go back to your trial subaccount by choosing the **trial** from the breadcrumbs.
2. In the left navigation panel, click **Destinations** under **Connectivity**.

The screenshot shows the SAP Cloud Platform Cockpit interface. The left sidebar has a navigation tree with 'Destinations' selected. The main content area displays 'Subaccount Details' with a subdomain and ID, and a 'Cloud Foundry' section with organization and member information. A 'Spaces' section shows one space, and a 'Create Space' button is available.

3. Download the file in your local machine from following link:

<https://ibm.box.com/s/1hucncv0a9j99xqyk9w9y111y7md7kc1>

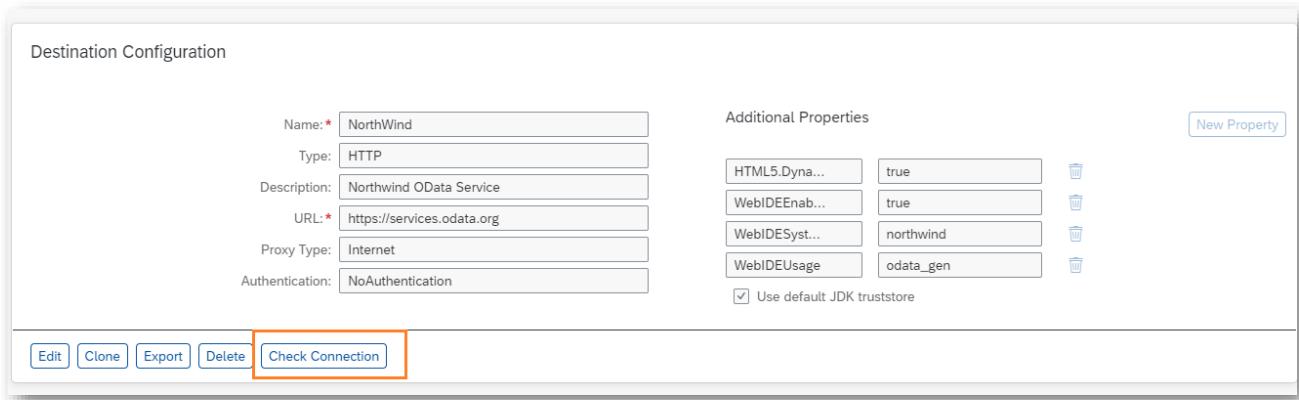
4. Click **Import Destination**.

The screenshot shows the 'Subaccount: trial - Destinations' page. The left sidebar shows 'Destinations' selected. The main area shows 'All: 2' destinations. At the bottom, there are buttons for 'New Destination', 'Import Destination' (which is highlighted with a red box), 'Certificates', 'Download Trust', and 'Renew Trust'.

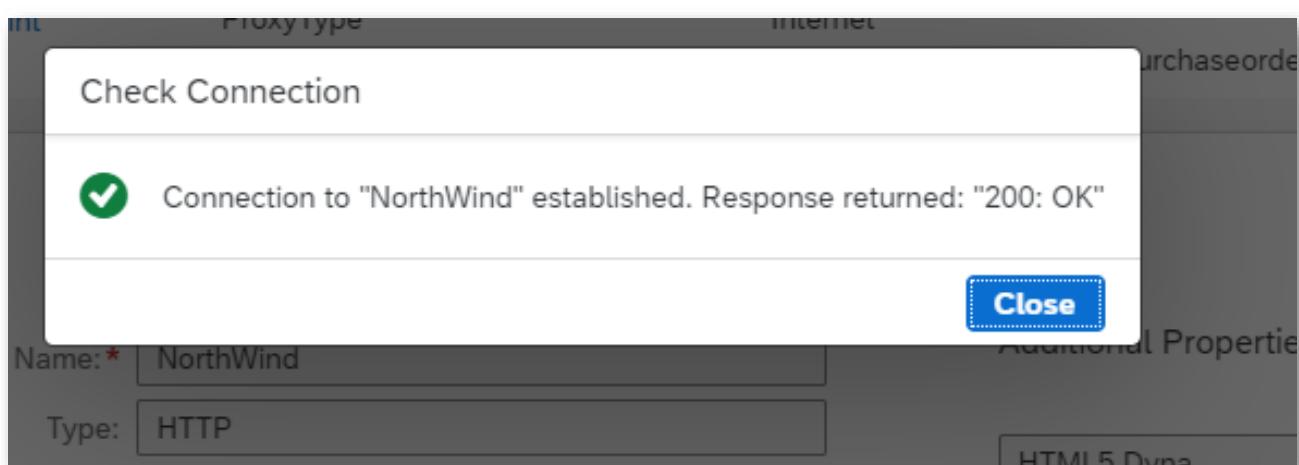
5. Upload the file which you downloaded in step 3.
6. A Destination with name **Northwind** should be created. Click **Save**.

The screenshot shows the 'Destination Configuration' dialog. It contains fields for Name (NorthWind), Type (HTTP), Description (Northwind OData Service), URL (https://services.odata.org), Proxy Type (Internet), and Authentication (NoAuthentication). On the right, there's an 'Additional Properties' section with several entries like 'HTML5.Dynam...' and 'WebIDEEnabled'. At the bottom, there are 'Save' and 'Cancel' buttons, with 'Save' highlighted with a red box.

- Click **Check Connection** to make sure that everything is working.

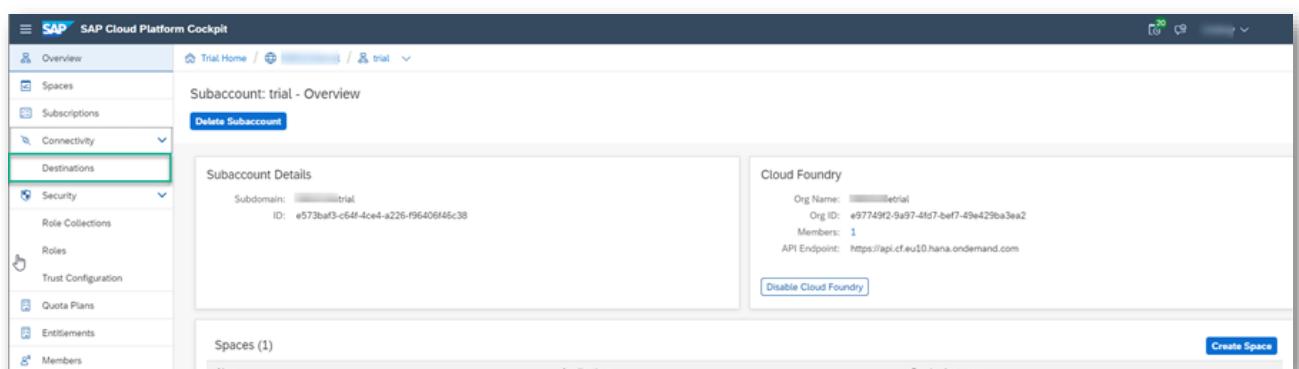


- You will get confirmation that the connection is established.



Step 6: Set Up Email SMTP configuration to send emails during workflow runtime execution

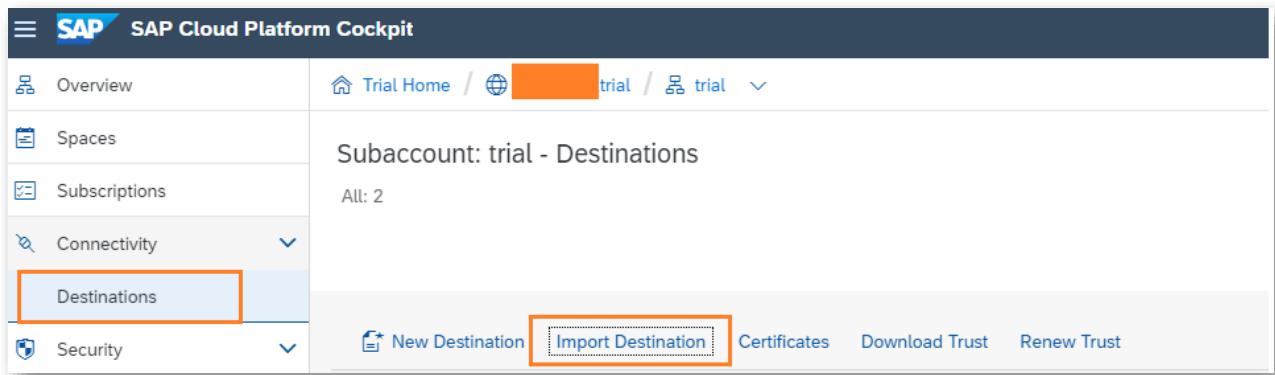
- Go back to your trial subaccount by choosing the **trial** from the breadcrumbs.
- In the left navigation panel, click **Destinations** under **Connectivity**.



- Download the file in your local machine from following link.

 <https://ibm.box.com/s/irdfq7amaa6r7jjfd7fw881uqxms5kyz>

- Click **Import Destination**.



SAP Cloud Platform Cockpit

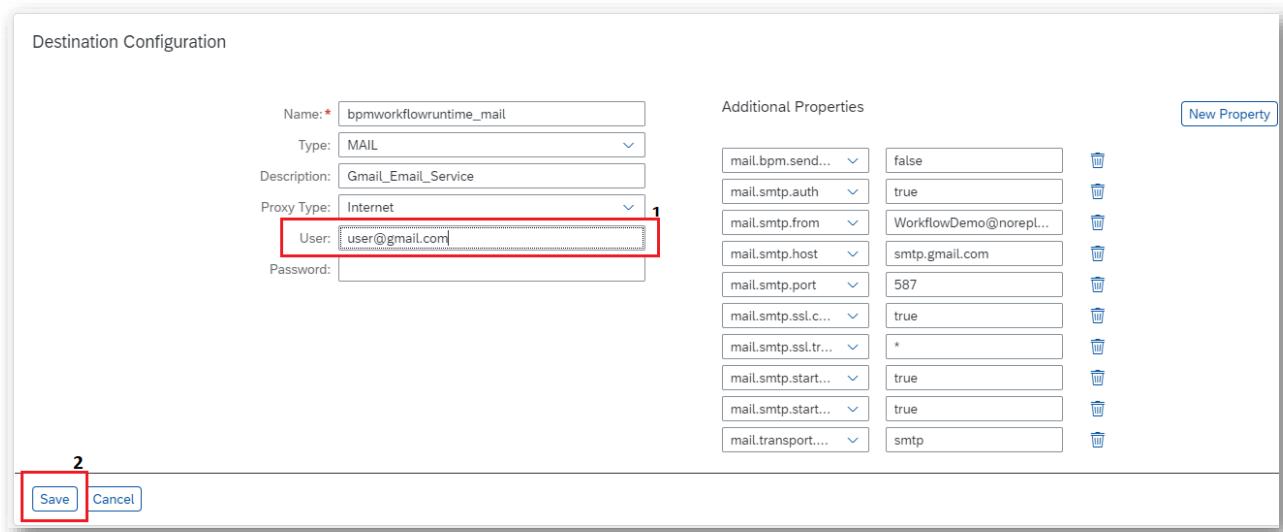
- Overview
- Spaces
- Subscriptions
- Connectivity
 - Destinations
- Security

Trial Home / trial / trial

Subaccount: trial - Destinations
All: 2

New Destination Import Destination Certificates Download Trust Renew Trust

- Upload the file, you downloaded in step 3.
- A Destination with name **bpmworkflowruntime_mail** should be created.
- Change the value of User field to your email address [For the sake of demo we have used Google mail account]
- Click **Save**.



Destination Configuration

Name: * <input type="text" value="bpmworkflowruntime_mail"/>	Additional Properties New Property
Type: <input type="text" value="MAIL"/>	<input type="text" value="false"/> mail.bpm.send...
Description: <input type="text" value="Gmail_Email_Service"/>	<input type="text" value="true"/> mail.smtp.auth
Proxy Type: <input type="text" value="Internet"/>	<input type="text" value="WorkflowDemo@norepl..."/> mail.smtp.from
User: <input type="text" value="user@gmail.com"/>	<input type="text" value="smtp.gmail.com"/> mail.smtp.host
Password: <input type="password"/>	<input type="text" value="587"/> mail.smtp.port
	<input type="text" value="true"/> mail.smtp.ssl.c...
	<input type="text" value="*"/> mail.smtp.ssl.tr...
	<input type="text" value="true"/> mail.smtp.start...
	<input type="text" value="true"/> mail.smtp.start...
	<input type="text" value="smtp"/> mail.transport....

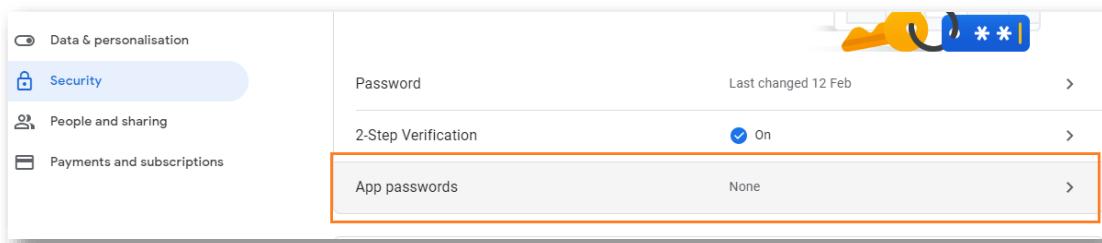
2

- You need to generate a password for this application from your Gmail account.
- Open your Gmail account.
- Click on Manage Your Google Account

12. From left panel select security and enable **2-Step Verification**.

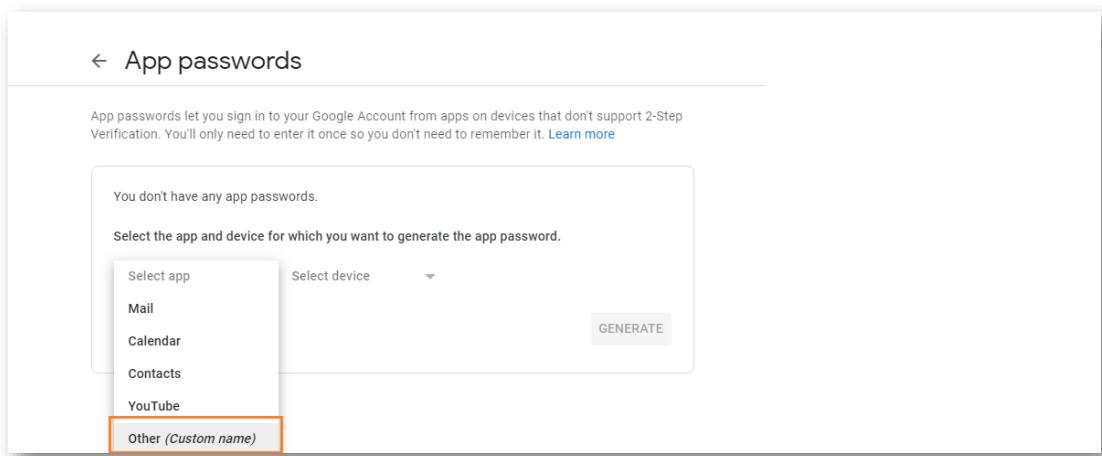


13. Once the 2-Step Verification is enabled. Select App Passwords

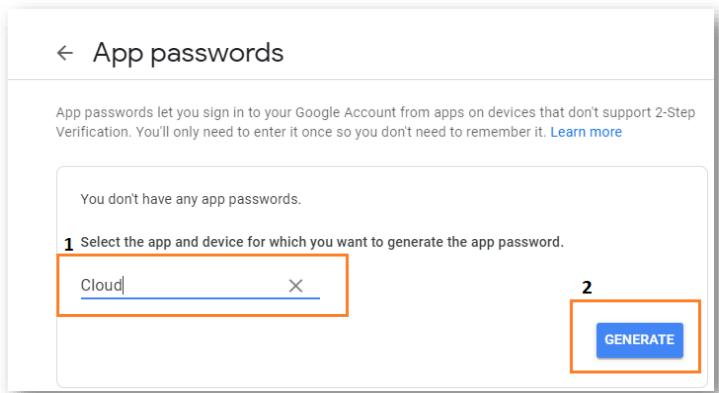


14. New window will be opened, and it will ask you to enter your Gmail account password.

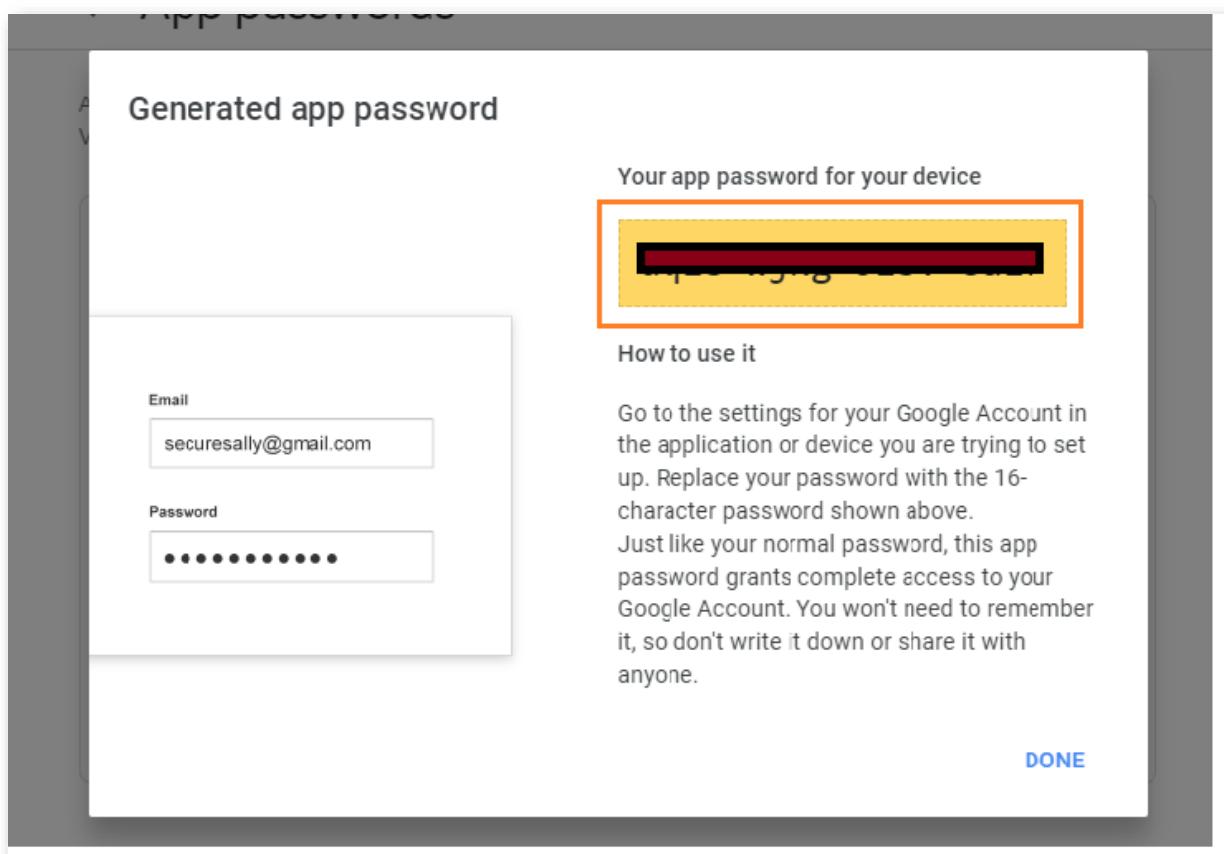
15. Select **Other** from Select app dropdown



16. Give any Name to the app, for example **Cloud** and click on **GENERATE**.



17. Copy the Generated app Password.



18. Open the destination we created in step 6

19. Click on **Edit** Button

The screenshot shows the 'Destinations' list. A single entry is visible: 'bpmworkflowruntime_mail' (Type: MAIL, Name: bpmworkflowruntime_mail, Basic Properties: mail.user ProxyType, Actions: edit icon, download icon, delete icon). The 'edit' icon is highlighted with an orange border.

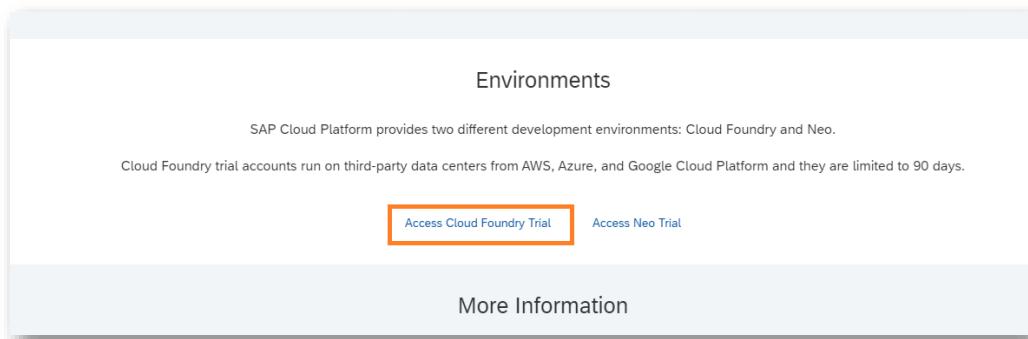
20. Paste the password copied in step 16 in the field Password. Click **Save**

The screenshot shows the 'Destination Configuration' dialog for the 'bpmworkflowruntime_mail' destination. In the 'Additional Properties' section, the 'Password' field (highlighted with an orange border) contains the copied app password. At the bottom left, there are 'Save' and 'Cancel' buttons, with 'Save' highlighted with an orange border.

[E] Prepare to Create Business Rules in SAP Cloud Platform (Cloud Foundry)

Step 1: Open the SAP Cloud Platform cockpit

1. In your Web browser, open the [SAP Cloud Platform](#) cockpit. If you do not have a trial account, see Prerequisites.
3. Scroll down to Environments and choose Access Cloud Foundry Trial.



Step 2: Add a Business Rule instance and Create service key for it

1. Go to your trial subaccount. If you have just created your trial account, choose trial from the breadcrumbs.
2. Choose Spaces from the left-hand navigation, and then choose **dev**.

A screenshot of the SAP Cloud Platform Cockpit. The top navigation bar shows "Trial Home / trial / dev". A red circle with the number "1" is on the "Overview" button. The left sidebar has a red box around the "Spaces" button, which is also highlighted with a red circle and the number "1". The main content area shows "Subaccount: trial - Spaces" with "All: 1". A "Create Space" button is visible. The "dev" space details are shown in a red-bordered box, with a red circle and the number "2" on its right side. Inside the box, there's a table with "Applications" (0 Started, 0 Stopped) and "Quota" (0 of 4GB Memory, 0 of 40 Services). There are edit and delete icons at the bottom.

3. Choose **Services | Service Marketplace** from the left-hand navigation, and search for Business rules.
4. Choose **Business Rules** service.

5. Choose **Instances** from the left-hand navigation, then choose **New Instance**.

6. In the wizard that comes up, leave the data as is and proceed by choosing **Next**. On the last page, enter default_business-rules as the instance name and choose **Finish**.

7. The new instance is displayed in the list and the status present under the **Last Operation** changes to **Created**.

Name	Plan	Last Operation	Actions
default_business-rules	lite	Created	

8. Choose the business rules service instance that you created.

Name	Plan	Last Operation	Actions
default_business-rules	lite	Created	

9. In the navigation area, choose **Service Keys** and then choose **Create Service Key**.

10. Provide **Name** 'business-rules' and then choose **Save**.

Create Service Key

*Name: 1

Configuration Parameters (JSON):

2 Cancel

11. The service key is generated as shown

The screenshot shows the SAP Cloud Platform Cockpit interface. On the left, there's a navigation bar with 'Referencing Apps' and 'Service Keys'. The 'Service Keys' tab is selected. In the center, a search bar contains 'business-rules'. Below it, a modal window titled 'business-rules' displays a JSON-formatted service key. A red box highlights the JSON content, which includes endpoints, rule repository URL, rule runtime URL, and a large public key block starting with 'MIICjANBgkqhkiG9w0BAQEFAAOCAg8AMIC...'. At the bottom of the JSON block, the 'apiuri' field is also highlighted.

```
{
  "endpoints": {
    "rule_repository_url": "https://bpmrulerrepository.cfapps.eu10.hana.ondemand.com",
    "rule_runtime_url": "https://bpmruleruntime.cfapps.eu10.hana.ondemand.com"
  },
  "html5-apps-repo": {
    "app_host_id": "4e486beb-e3e3-4aaa-8a5a-c843e767f708"
  },
  "uaa": {
    "uaadomain": "authentication.eu10.hana.ondemand.com",
    "tenantmode": "dedicated",
    "sburl": "https://internal-xsuaa.authentication.eu10.hana.ondemand.com",
    "clientid": "sb-clone-1d3f496a-bab0-45be-8fe3-d0f3348c791eb35700/bpmrulebrokerIb2466",
    "verificationkey": "-----BEGIN PUBLIC KEY-----\nMIICjANBgkqhkiG9w0BAQEFAAOCAg8AMIC...-----END PUBLIC KEY-----",
    "apiuri": "https://api.authentication.eu10.hana.ondemand.com"
  }
}
```

We need service key to consume the business rule as API from any REST Clients

Step 3: Create role collection

1. Go back to your trial subaccount by choosing **trial** from the breadcrumbs.
2. From the left-hand navigation, choose **Security | Role Collections**, then choose **to click on + icon [Create New Role Collection.]**

The screenshot shows the 'Role Collections' page. The left sidebar has 'Destinations' and 'Security' selected. Under 'Security', 'Role Collections' is highlighted. The main area shows a table with one row: 'Business_Application_Studio_Administrator'. The 'Name' column is 'Business_Application_Studio_Administrator', 'Description' is 'Allows administrators to manage (export and delete) user data.', 'Roles' is 'Administrator', and 'Users' is empty. There are 'Groups' and 'Actions' columns. A red box highlights the '+' button in the top right corner of the table header.

3. Enter **business-rules** as the name for your role collection, then choose **Create**.

The screenshot shows the 'Create Role Collection' dialog. It has fields for 'Name:' (with a red asterisk) containing 'business-rules', 'Description:' (empty), and two buttons at the bottom: 'Create' (highlighted with a red box) and 'Cancel'.

4. Choose business-rules role collection.

SAP Cloud Platform Cockpit

Subaccount: trial - Role Collections

Name	Description	Roles	Actions
business-rules			Edit Delete
Cloud Connector Administrator	Operate the data transmission tunnels used by the Cloud Connector.	Cloud Connector Administrator	Edit Delete
Connectivity and Destination Administrator	Operate the data transmission tunnels used by the Cloud Connector and manage the destination configurations, certificates and subaccount trust.	Cloud Connector Administrator, Destination Administrator	Edit Delete
Destination Administrator	Manage the destination configurations, certificates and subaccount trust.	Destination Administrator	Edit Delete
Subaccount Administrator	Administrative access to the subaccount	Cloud Connector Administrator, Destination Administrator, Subaccount Admin, Subaccount Service Administrator, User and Role Administrator	Edit Delete
Subaccount Service Administrator	Administrative access to service brokers and environments on a subaccount level.	Subaccount_Service_Admin	Edit Delete

5. Choose Edit

Role Collection: business-rules - Overview

[Edit](#) [Delete](#)

Description:

Roles (0) Users (0) User Groups (0)

6. Click on Add Role.

Role Collection: wfs - Overview

[Save](#) [Cancel](#)

[EDIT MODE](#)

Description:

Roles (0) Users (0) User Groups (0) Description

Role Name	Role Template	Application Identifier	Actions
No Roles			

[Search](#) [+](#) [Add a role](#)

- In the wizard that comes up, select following role one by one and choose **Save**
 - RuleRepositorySuperUser
 - RuleRuntimeSuperUser

Role Collection: business-rules - Overview

EDIT MODE

Description:

Roles (2) Users (0) User Groups (0) Description

Role Name	Role Template	Application Identifier	Actions
RuleRepositorySuperUser	RuleRepositorySuperUser	bpmrulebroker!b2466	
RuleRuntimeSuperUser	RuleRuntimeSuperUser	bpmrulebroker!b2466	

- Before adding a new role, you need to save the unsaved changes and again click on Edit button.
- These roles are required to access the **Manage Rules Project** application to author and execute Business Rules.

Step 4: Assign role collection

- Go back to your trial subaccount by choosing the **trial** from the breadcrumbs.
- From the left-hand navigation, choose **Security | Trust Configuration**, then click **sap.default**

SAP Cloud Platform Cockpit

Overview Trial Home / trial / trial

Subaccount: trial - Trust Configuration

All: 1

New Trust Configuration SAML Metadata

Status	Name	Description	Origin Key	Identity provider is available for user logon	Actions
Default	sap.default		sap.default	<input checked="" type="checkbox"/>	

- Enter your email address, then choose **Show Assignments**.

SAP Cloud Platform Cockpit

Role Collection Assignment Home [Europe (Rot) - Cloud Foundry - Trial] / trial / trial / SAP ID Service

Trust Configuration: SAP ID Service - Role Collection Assignment

All: 0

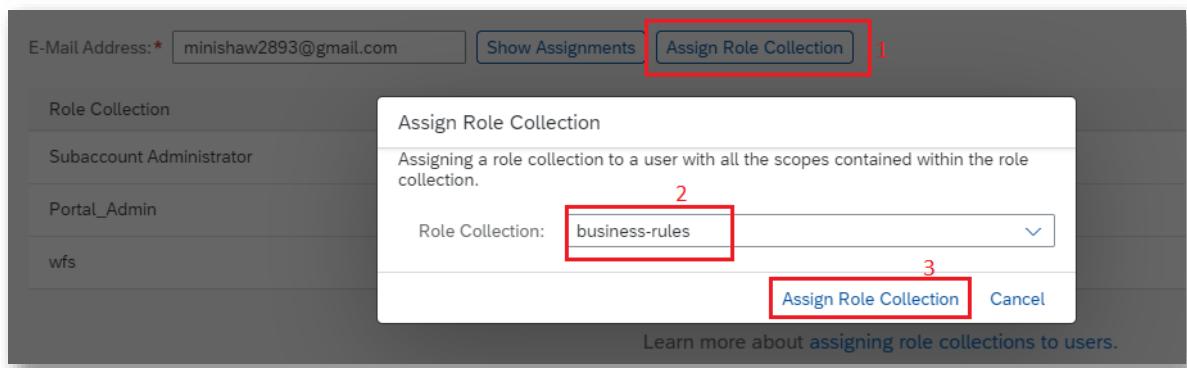
*E-Mail Address: Show Assignments Assign Role Collection

To see and assign role collections, you must first add identity provider SAP ID Service.

as a user of

Add User Cancel

4. Choose **Add User**.
5. Choose **Assign Role Collection** and select the **business-rules** from drop-down that you have created before. Then choose **Assign Role Collection** again.

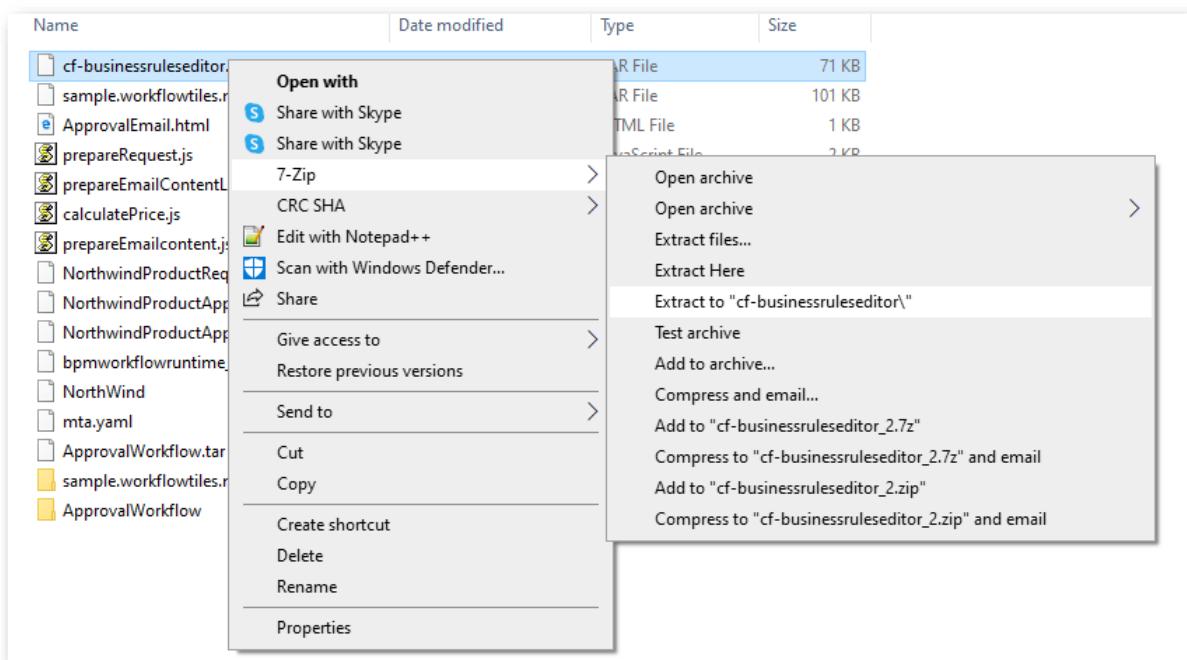


[F] Create Build and Deploy Manage Rules Project Application

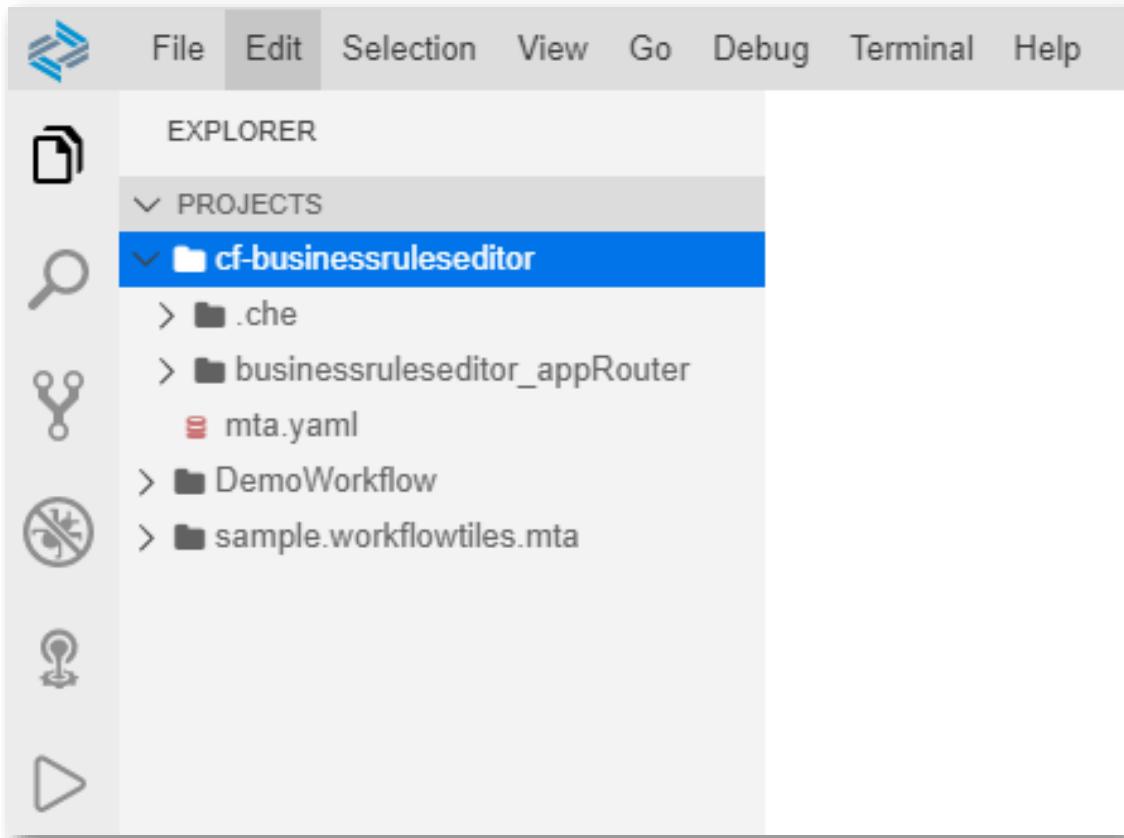
Step 1: Import Project

1. Download the file in your local machine from below link and Extract it using 7-Zip or any relevant software.

 <https://ibm.box.com/s/d3zd23t2916kyjyhnbyhqe40ms1uiac1>



2. Drag and Drop the extracted folder into workspace.



Step 2: Build Project

1. Right click on folder cf-businessruleseditor → select **Open in Terminal**
2. In Terminal, Enter Command: **\$ mbt build**
3. The MTA archive gets generated at

/home/user/projects/cf-businessruleseditor/mta_archives/businessruleseditor_0.0.1.mtar

```
user: cf-businessruleseditor $ mbt build
[2020-08-06 11:59:54] INFO Cloud MTA Build Tool version 1.0.15
[2020-08-06 11:59:54] INFO generating the "Makefile_20200806115954.mta" file...
[2020-08-06 11:59:54] INFO done
[2020-08-06 11:59:54] INFO executing the "make -f Makefile_20200806115954.mta p=cf mtar= strict=true mode=" command...
[2020-08-06 11:59:54] INFO validating the MTA project
[2020-08-06 11:59:54] INFO validating the MTA project
[2020-08-06 11:59:54] INFO building the "businessruleseditor_appRouter" module...
[2020-08-06 11:59:54] INFO executing the "npm install --production" command...
...npm WARN lifecycle The node binary used for scripts is /extbin/bin/node but npm is using /opt/nodejs/node-v10.20.1-linux-x64/bin/node itself. Use the
ude the path for the node binary npm was executed with.

> @sap/node-jwt@1.6.11 install /home/user/projects/cf-businessruleseditor/businessruleseditor_appRouter/node_modules/@sap/node-jwt
> node ./build.js

`linux-x64-v8-6.8` exists; testing
Binary is fine; exiting
npm WARN html5-apps-approuter@ No repository field.
npm WARN html5-apps-approuter@ No license field.

added 236 packages from 133 contributors and audited 236 packages in 4.417s

1 package is looking for funding
  run `npm fund` for details

found 9 vulnerabilities (4 low, 5 high)
  run `npm audit fix` to fix them, or `npm audit` for details
[2020-08-06 11:59:59] INFO the build results of the "businessruleseditor_appRouter" module will be packaged and saved in the "/home/user/projects/cf-bus
build_tmp/businessruleseditor_appRouter" folder
[2020-08-06 12:00:05] INFO finished building the "businessruleseditor_appRouter" module
[2020-08-06 12:00:05] INFO generating the metadata...
[2020-08-06 12:00:05] INFO generating the "/home/user/projects/cf-businessruleseditor/.cf-businessruleseditor_mta_build_tmp/META-INF/mtad.yaml" file...
[2020-08-06 12:00:05] INFO generating the MTA archive...
[2020-08-06 12:00:06] INFO the MTA archive generated at: /home/user/projects/cf-businessruleseditor/mta_archives/businessruleseditor_0.0.1.mtar
[2020-08-06 12:00:06] INFO cleaning temporary files...
user: cf-businessruleseditor $
```

Step 3: Deploy project

1. In Terminal, enter Command:

```
$ cf deploy mta_archives/businessruleseditor_0.0.1.mtar
```

```
Problems      user@workspaces-ws-r88rh-deployment-6bcc9fbcbc-jt8lb: ~/projects/DemoWorkflow      user@works
user: cf-businessruleseditor $ cf deploy mta_archives/businessruleseditor_0.0.1.mtar
```

Your application will be deployed to your Cloud Foundry platform.

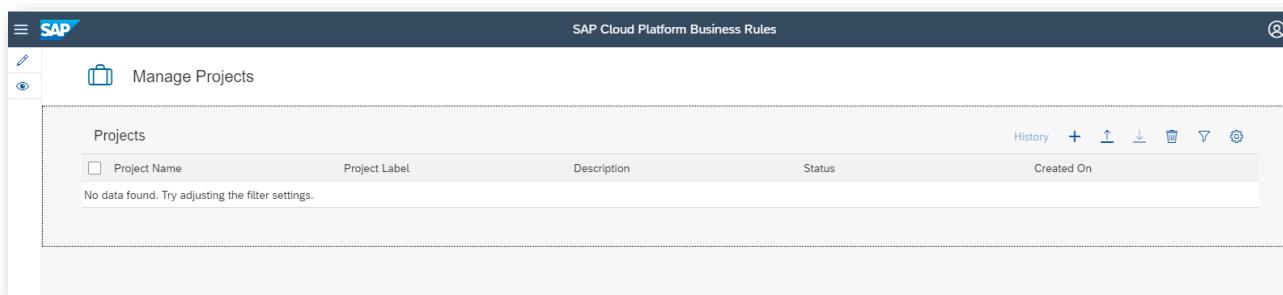
Step 4: Access your Manage Rule Project application

1. Open the job console at the end of the deployment process, and search for the application URL. It should appear in the console as follows:

https://<dev space name>-trial-dev-businessruleseditor-approuter.<your endpoint>.hana.ondemand.com

```
Problems      user@workspaces-ws-r88rh-deployment-6bcc9fbcbc-jt8lb: ~/projects/DemoWorkflow      user@workspaces-ws-r88rh-deployment-6bcc9fbcbc-jt8lb: ~/projects/cf-businessruleseditor x
1 of 1 done
1 of 1 done
Creating application "businessruleseditor_appRouter" from MTA module "businessruleseditor_appRouter"...
Uploading application "businessruleseditor_appRouter"...
Scaling application "businessruleseditor_appRouter" to "1" instances...
Staging application "businessruleseditor_appRouter"...
Application "businessruleseditor_appRouter" staged
Starting application "businessruleseditor_appRouter"...
Application "businessruleseditor_appRouter" started and available at "████████-dev-businessruleseditor-approuter.cfapps.eu10.hana.ondemand.com"
Skipping deletion of services, because the command line option "--delete-services" is not specified.
Process finished.
Use "cf dmol -i 100b4678-d7dd-11ea-9b24-eeee0a8ab33a" to download the logs of the process.
user: cf-businessruleseditor $
```

2. Use this URL to access the **Manage Rules Project** application.

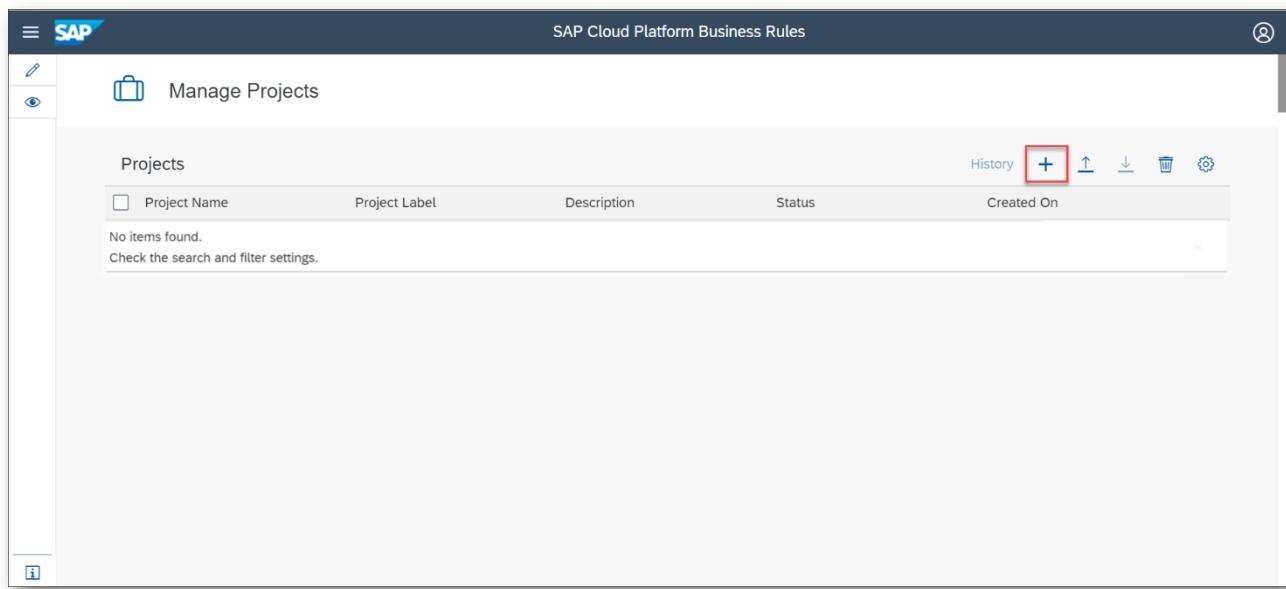


[G] Author and Execute Business Rules using Manage Rule Project

-  We are using Business Rules to fetch the approvers details based on total cost of PO

Step 1: Create a Project to Author Rules

1. Open the **Manage Rules Project** application. In the **Manage Rules Project** screen, choose +.



2. Enter the following details of the project:

Field Name	Value
Name	DetermineApprover
Label	DetermineApprover
Description	Business rules to determine approver for the new PO request based on total cost.
System	SAP Cloud Platform
Expression Language	2.0

-  **Label** and **Description** are a mandatory field. Description field does not support special characters.

The screenshot shows the SAP Cloud Platform Business Rules interface. At the top, there's a navigation bar with icons for SAP, Manage Projects, and a New Project button. On the right, there are Save, Cancel, Validate, and Activate buttons. The main area is titled "SAP Cloud Platform Business Rules" and shows a "New Project" screen. It has tabs for Details, Data Objects, Rule Services, Rulesets, and Rules. The "Details" tab is selected. The project is currently in "DRAFT" mode. Version information (Version: 0.0.0, Revision: Initial) and description (Version Description: Initial, Expression Language: 2.0) are displayed. The "Basic Details" section contains fields for Name (DetermineApprover), Label (DetermineApprover), and Description (Business rules to determine approver for the new PO request based on total cost). Other settings include System (SAP Cloud Platform), Expression Language (2.0), and Included Projects (empty). The "Save" button is highlighted with a red box.

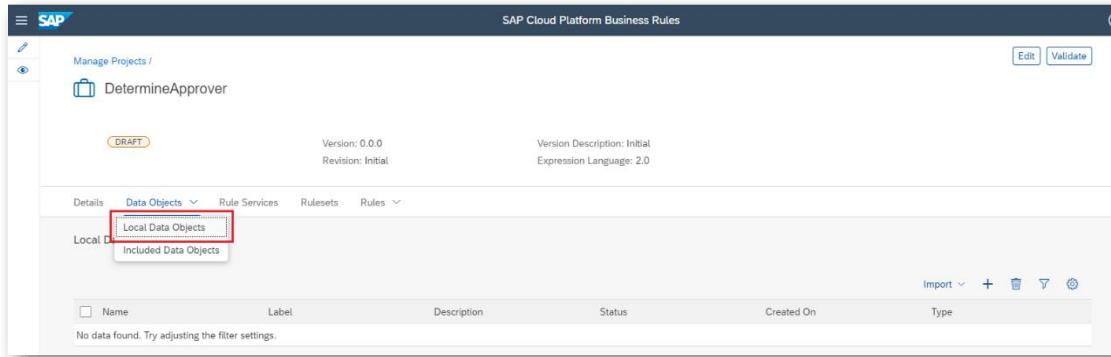
3. Save your project. Choose Save.

This screenshot is identical to the one above, showing the "New Project" screen in draft mode. The "Save" button at the top right is now highlighted with a red box, indicating it is the next action to be taken.

Step 2: Create Data Objects and Configure Value Help for Scenario

 For this demo keep the data object and its attribute name same as shown.

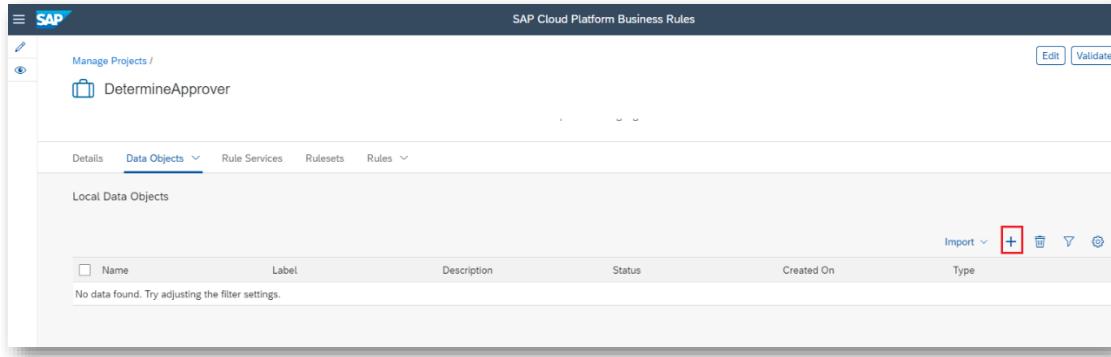
1. Choose Data Objects > Local Data Objects.



The screenshot shows the SAP Cloud Platform Business Rules interface. The project 'DetermineApprover' is selected. The 'Data Objects' tab is active, and the 'Local Data Objects' section is highlighted with a red box. The table below shows no data objects found.

Name	Label	Description	Status	Created On	Type
No data found. Try adjusting the filter settings.					

2. In the **Local Data Objects** section, choose **+**.

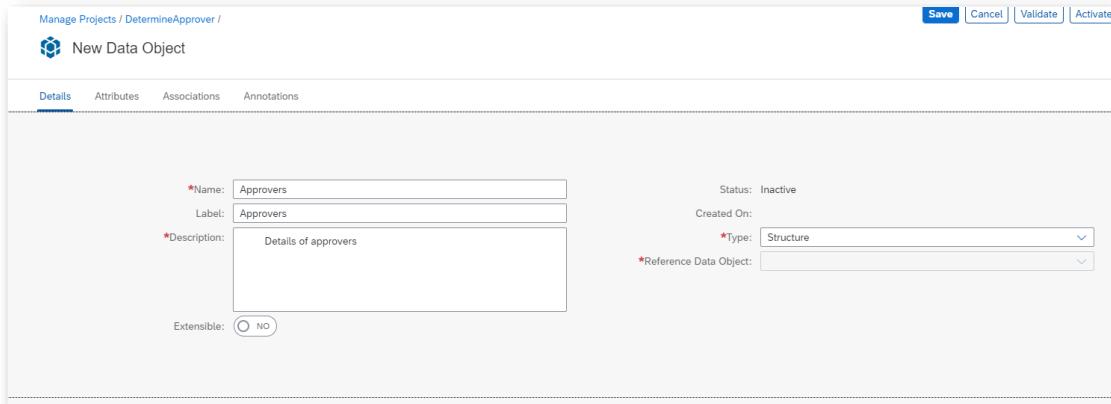


The screenshot shows the SAP Cloud Platform Business Rules interface. The 'Data Objects' tab is active, and the 'Local Data Objects' section is visible. The 'Import' and 'Add' buttons are at the top right, with the 'Add' button highlighted with a red box. The table below shows no data objects found.

Name	Label	Description	Status	Created On	Type
No data found. Try adjusting the filter settings.					

3. In the **New Data Object** screen, provide the following details for the output data object as shown:

Field Name	Value
Name	Approvers
Label	Approvers
Description	Details of approvers
Type	Structure



The screenshot shows the 'New Data Object' screen. The 'Details' tab is selected. The form fields are as follows:

- *Name: Approvers
- Label: Approvers
- *Description: Details of approvers
- Extensible: NO
- Status: Inactive
- Created On: [empty]
- *Type: Structure
- *Reference Data Object: [empty]

4. Choose **Attributes** tab, then choose **+** to create a new attribute for the data object **Approvers**.

Name	Label	Description	Business Data Type
No data			

5. Similarly, create 2 new attributes with the following values:

Name	Label	Description	Business Data Type
level1_approver_email_id	Level 1 approver emailId	Email Id of level1 approver	String
level2_approver_email_id	Level 2 approver emailId	Email Id of level2 approver	String

6. Choose **Activate**

Name	Label	Description	Business Data Type
level1_approver_emailid	Level 1 approver emailId	Email Id of level1 approver	String
level2_approver_emailid	Level 2 approver emailId	Email Id of level2 approver	String

7. Similarly, create and activate **PurchaseOrder** data object and its attribute with the following values:

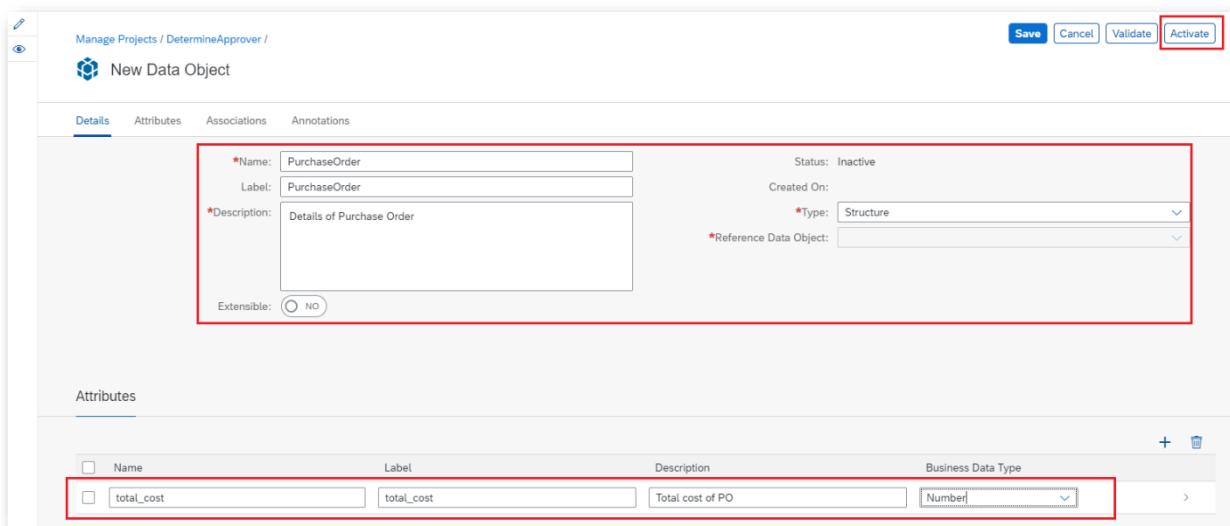
Table 1: Data Object

Field Name	Value
Name	PurchaseOrder
Label	PurchaseOrder
Description	Details of Purchase Order
Type	Structure

Table 2: Attribute

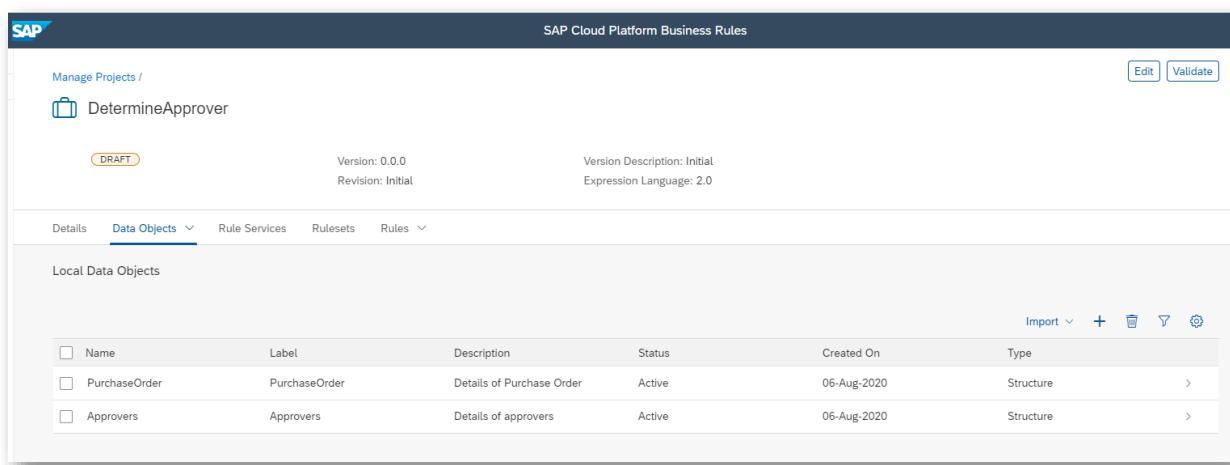
Field Name	Value
Name	total_cost
Label	total_cost
Description	Total cost of PO
Business Data Type	Number

8. Then, choose **Activate**



The screenshot shows the 'New Data Object' creation screen. The 'Activate' button at the top right is highlighted with a red box. The 'Details' tab is selected, showing fields for Name (PurchaseOrder), Label (PurchaseOrder), Description (Details of Purchase Order), Status (Inactive), Created On, Type (Structure), and Reference Data Object. The 'Attributes' tab is also shown, with a table listing an attribute named 'total_cost' with a value of 'Total cost of PO' and a type of 'Number'. This table is also highlighted with a red box.

9. Navigate to the **Local Data Objects** tab to view the list of data objects.



The screenshot shows the 'Local Data Objects' tab in the Business Rules interface. The 'Data Objects' tab is selected. It displays a table of data objects with columns for Name, Label, Description, Status, Created On, and Type. Two entries are visible: 'PurchaseOrder' (Label: PurchaseOrder, Description: Details of Purchase Order, Status: Active, Created On: 06-Aug-2020, Type: Structure) and 'Approvers' (Label: Approvers, Description: Details of approvers, Status: Active, Created On: 06-Aug-2020, Type: Structure). The entire table area is highlighted with a red box.

 For this demo keep the data object and its attribute name same as shown.

 Make sure both Data Objects are in Active State. In case any data object is inactive. Go to that data object. Choose Edit and then choose Activate option.

Step 3: Create Decision table rules

1. Navigate to the **Rules > Local Rules** tab, then choose +.

The screenshot shows a software interface for managing rules. At the top, there's a header with 'Manage Projects / DetermineApprover'. Below it, a status bar indicates 'DRAFT', 'Version: 0.0.0', 'Revision: Initial', 'Version Description: Initial', and 'Expression Language: 2.0'. The main navigation bar includes 'Details', 'Data Objects', 'Rule Services', 'Rulesets', and 'Rules'. The 'Rules' dropdown is expanded, showing 'Local Rules' and 'Included Rules', with 'Local Rules' selected. A table below has columns for Name, Label, Description, Status, Created On, and Type. A red box highlights the 'Local Rules' button in the navigation bar. A message at the bottom says 'No data found. Try adjusting the filter settings.'

2. In the New Rule prompt, provide the following details:

Field Name	Value
Name	DetermineEquipmentRules
Type	Decision Table

3. Choose **Create**

The screenshot shows a modal dialog titled 'New Rule'. It contains two fields: 'Name' with the value 'DetermineApproversRule' and 'Type' set to 'Decision Table'. At the bottom are 'Create' and 'Cancel' buttons. The background shows a dark interface with a 'Description' field partially visible.

4. In the **New Rule** page, provide the following details and then choose **Settings** icon.

Field Name	Value
Label	Determine Approvers Rule
Description	Rules to determine approvers for the PO created based on its total cost

The decision table settings window opens.

5. In the decision table settings window, select the **Hit Policy as First Match**. With **Hit Policy as First Match**, the decision table returns the first row that matches the condition.

6. Press **CTRL + SPACE** to load the autosuggestion list. Then choose **PurchaseOrder** under **Vocabulary** section.

7. Choose the attribute **total_cost** from the **Vocabulary** section.

The screenshot shows the 'Decision Table Settings' interface. In the 'Conditions' section, a condition expression 'PurchaseOrder.' is selected. In the 'Result' section, the attribute 'total_cost' is chosen from the 'Vocabulary' dropdown, which is highlighted with a red box. Below the result, two informational messages are displayed: 'Selecting Access as Hidden will set the value of all the rows to the default value.' and 'Selecting Access as Editable will set the values of the new rows to the default value.' At the bottom, there are sections for 'Result Attributes', 'Access', and 'Default Value', each with a 'No data' message.

8. From the **Fixed Operator** dropdown list, select **None**.

The screenshot shows the 'Decision Table Settings' interface. In the 'Conditions' section, a condition expression 'PurchaseOrder.total_cost' is selected. In the 'Fixed Operator' section, the operator 'None' is chosen from the dropdown, which is highlighted with a red box. Below the operator, four comparison operators are listed: '!= is not equal', '=' is equal', '>= is equal or greater than', and '> is greater than'. Each has a corresponding dropdown menu and a delete button ('X').

10. Choose **Approvers** as the **Result** data object from the dropdown list and then choose **Apply**.

The screenshot shows the 'Decision Table Settings' interface. In the 'Conditions' section, a condition expression 'PurchaseOrder.total_cost' is selected. In the 'Result' section, the data object 'Approvers' is chosen from the dropdown, which is highlighted with a red box. Below the result, two informational messages are displayed: 'Selecting Access as Hidden will set the value of all the rows to the default value.' and 'Selecting Access as Editable will set the values of the new rows to the default value.' At the bottom, there are sections for 'Result Attributes', 'Access', and 'Default Value'. Under 'Result Attributes', two entries are listed: 'level2_approver_emilid' with 'Editable' access and a 'Default Value' field containing 'Use Ctrl+Space to get suggestions.', and 'level1 approver emilid' with 'Editable' access and an empty 'Default Value' field. In the bottom right corner, the 'Apply' button is highlighted with a red box.

A decision table gets created with the condition columns and result columns as shown:

Manage Projects / DetermineApprover /

New Rule

Details Decision Table

*Name: DetermineApproversRule
Label: Determine Approvers Rule
*Description: Rules to determine approvers for the PO created based on its total cost
Result: Approvers
Status: Inactive
Created On:
*Hit Policy: First Match

Decision Table

Decision Table			Add Row	Delete Row	Copy Row	Cut Row	Paste Row	⚙️
If	Then							
PurchaseOrder.total_cost	level2_approver_emailid			level1 approver emailid				

No data

11. You can add any condition and result values in decision table depending upon your requirement. For Demo Following condition are entered.

Decision Table

Decision Table			Add Row	Delete Row	Copy Row	Cut Row	Paste Row	⚙️
If	Then							
<input type="checkbox"/> PurchaseOrder.total_cost	Level 2 approver emailid			Level 1 approver emailid				
<input type="checkbox"/> <= 5000	[REDACTED]			[REDACTED]				
<input type="checkbox"/> IN (5000 .. 10000)	[REDACTED]			[REDACTED]				
<input type="checkbox"/> >= 10000	[REDACTED]			[REDACTED]				

String must be enclosed within single inverted commas. e.g. 'user@example.com'.

Provide Fiori launchpad access to all the approvers so that they can access 'My Inbox' application. Reference: [Step 4: Assign role collection](#)

12. Choose Activate

The screenshot shows the 'Determine Approvers Rule' configuration page. At the top right, there are four buttons: 'Save', 'Cancel', 'Validate', and 'Activate'. The 'Activate' button is highlighted with a red box. Below the buttons, there are tabs for 'Details' and 'Decision Table'. Under 'Decision Table', there is a table titled 'Decision Table' with columns 'If' and 'Then'. The 'If' column contains conditions for PurchaseOrder.total_cost: '<= 5000', 'IN (5000 .. 10000)', and '>= 10000'. The 'Then' column contains two rows for 'Level 2 approver emailId' and 'Level 1 approver emailId', each with three entries. A note at the bottom says '*Hit Policy: First Match'.

Step 4: Create Rule Services

1. Navigate to the project using breadcrumbs

The screenshot shows the 'DetermineApprover' project details page. At the top left, it says 'Manage Projects / DetermineApprover'. Below that is a grid icon and the text 'Determine Approvers Rule'. There are tabs for 'Details' and 'Decision Table', with 'Details' being the active tab. The 'Details' tab shows a 'DRAFT' status, version information (Version: 0.0.0, Revision: Initial), and a 'Version Description: Initial Expression Language: 2.0'. Below the tabs, there is a section for 'Rule Services' with a table header: 'Name', 'Label', 'Description', 'Status', and 'Created On'. A red box highlights the 'Rule Services' tab. A red '+' button is located at the bottom right of the table area.

2. Navigate to the **Rule Service** tab, then choose + to create a new rule service.

The screenshot shows the 'Rule Services' tab from the previous screenshot. The table header is visible: 'Name', 'Label', 'Description', 'Status', and 'Created On'. A red '+' button is located at the bottom right of the table area. The table body displays the message 'No data found. Try adjusting the filter settings.'

3. In the New Rule Service page, enter the following details:

Field Name	Value
Name	DetermineApprovers
Label	DetermineApprovers
Description	Rule service to determine approvers for new PO created based on total cost

4. In the Vocabulary tab, choose + and select the following options:

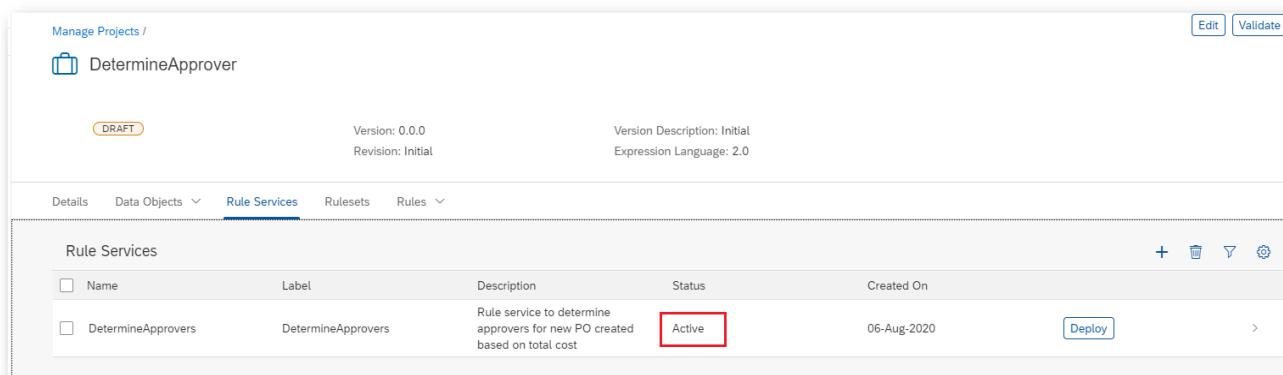
Field Name	Value
Name	PurchaseOrder
Usage	Input

5. Similarly, choose + to add a new row and select the following options:

Field Name	Value
Name	Approvers
Usage	Result

6. Then, choose Activate.

7. Navigate to the **Rule Service** tab to view the list of rule services.



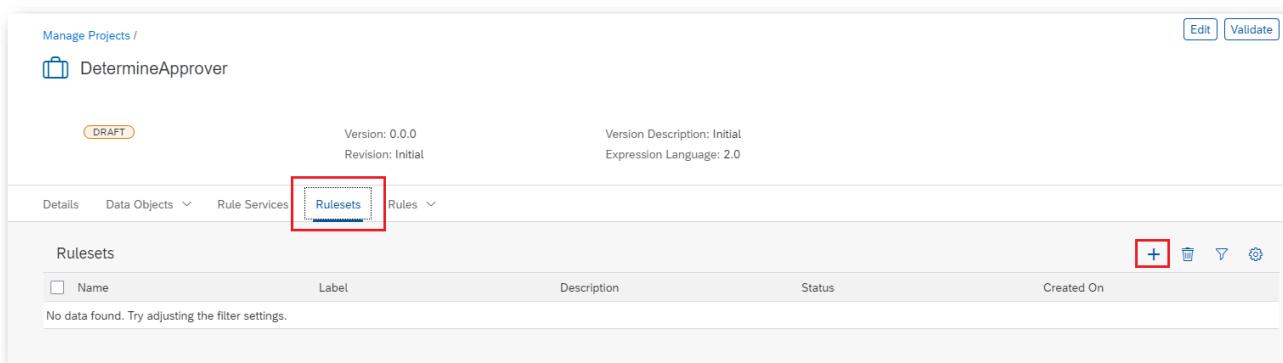
The screenshot shows the 'Rule Services' tab selected in the navigation bar. A single rule service, 'DetermineApprovers', is listed with the following details:

Name	Label	Description	Status	Created On	Actions
DetermineApprovers	DetermineApprovers	Rule service to determine approvers for new PO created based on total cost	Active	06-Aug-2020	<button>Deploy</button>

 Make sure all the rule services are in **Active** status.

Step 5: Create Rulesets

1. Navigate to the Ruleset tab, then choose **+**.



The screenshot shows the 'Rulesets' tab selected in the navigation bar. No rulesets have been created yet, as indicated by the message 'No data found. Try adjusting the filter settings.' A red box highlights the '+' button in the top right corner of the table header.

2. In the New Ruleset page, enter the following details:

Field Name	Value
Name	DetermineApproversRuleset
Label	Determine Approvers Ruleset
Description	Ruleset that contain rules needed for determining approvers for the new PO
Rule Service	DetermineApprovers

 You can leave the **Priority** and **Policy** fields and **Vocabulary** section as it is.

Manage Projects / DetermineApprover /

New ruleset

Details Vocabulary Rules

*Name: DetermineApproversRuleset
 Label: Determine Approvers Ruleset
 *Description: Rules that contain rules needed for determining approvers for the new PO
 *Policy: Aggregation

Status: Inactive
 Created On:
 Rule Service: DetermineApprovers
 *Priority:

Vocabulary

3. Choose the Rules tab, choose Add Rule > Insert First.

Manage Projects / DetermineApprover /

New ruleset

Details Vocabulary Rules

Name	Description	Origin
No data		

Add Rule ^ v
 Insert First
 Insert After

4. Select Determine Approval Rule from the dropdown list. Then, choose Activate to activate the rule set.

Manage Projects / DetermineApprover /

New ruleset

Details Vocabulary Rules

Name	Description	Origin
Determine Approvers Rule	Rules to determine approvers for the PO created based...	

Save Cancel Validate Activate

5. Navigate to the Ruleset tab to view the list of rule sets as shown:

Manage Projects / DetermineApprover

DRAFT Version: 0.0.0 Revision: Initial Version Description: Initial Expression Language: 2.0

Details Data Objects Rule Services Rulesets Rules

Rulesets

Name	Label	Description	Status	Created On
DetermineApproversRuleset	Determine Approvers Ruleset	Ruleset that contain rules needed for determining approvers for the new PO	Active	06-Aug-2020

Make sure all the rulesets are in Active status.

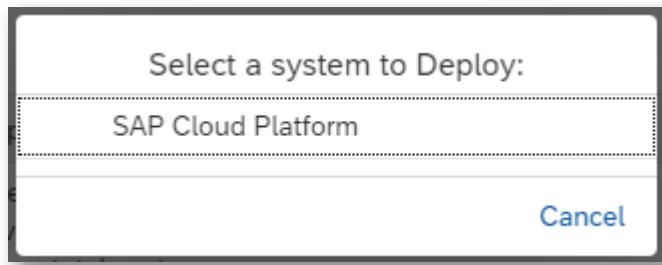
Step 6: Deploy Rule Service to SAP Cloud Platform

1. Before deployment Ensure that each entity of the project is active.
2. Navigate to the **Rule Service** tab and then choose **Deploy** button of DetermineApprovers to deploy the rule service.

The screenshot shows the SAP Project Management interface for a project named 'DetermineApprover'. The 'Rule Services' tab is selected, indicated by a red box. In the table below, there is one entry for 'DetermineApprovers' with a 'Deploy' button highlighted with a red box.

Name	Label	Description	Status	Created On	Action
DetermineApprovers	DetermineApprovers	Rule service to determine approvers for new PO created based on total cost	Active	06-Aug-2020	Deploy

3. Choose **SAP Cloud Platform** for deploying the rule service.



4. You will see the following message on successful activation of the rule service:

The screenshot shows the SAP Project Management interface for the 'DetermineApprover' project. The 'Rule Services' tab is selected. A message box at the bottom states 'Rule service is deployed successfully.' A red box highlights this message.

5. Choose settings button

The screenshot shows the 'Rule Services' tab selected in the navigation bar. A red box highlights the 'Settings' icon (a gear) in the top right corner of the table header.

Name	Label	Description	Status	Created On	Actions
DetermineApprovers	DetermineApprovers	Rule service to determine approvers for new PO created based on total cost	Active	06-Aug-2020	<button>Deploy</button>

6. Select ID and choose OK

The screenshot shows the 'Select All' dialog box with various filter options. The 'ID' checkbox is selected and highlighted with a red box. The 'OK' button at the bottom is also highlighted with a red box.

7. Please save the Rule Service ID. It will be required while developing workflow to call this rule service.

The screenshot shows the 'Rule Services' tab selected. The 'ID' column for the 'DetermineApprovers' service is highlighted with a red box, showing the value '89c8e63a58af4227942852cc1>401b664'.

Name	Label	Description	Status	Created On	ID
DetermineApprovers	DetermineApprovers	Rule service to determine approvers for new PO created based on total cost	Active	06-Aug-2020	89c8e63a58af4227942852cc1>401b664

Step 7: Test the Business Rules from SAP API Business Hub.

Use following Ref link to test the Business Rules created in step 6.



<https://developers.sap.com/tutorials/cp-cf-businessrules09-test-apis.html>

[H] Prepare to use Business Rule in Workflow

Step 1: Get Parameters of Business Rule Instance

Get the following parameters values from the service keys of your business rules instance:

- clientid
- clientsecret
- url

Reference: [17The service key is generated as shown](#)

Step 2: Create Destination

1. Go back to your trial subaccount by choosing the **trial** from the breadcrumbs.
2. In the left navigation panel, click **Destinations** under **Connectivity**.

The screenshot shows the SAP Cloud Platform Cockpit interface. The left sidebar has a 'Destinations' section highlighted with a red box. The main content area displays 'Subaccount: trial - Overview' with 'Subaccount Details' and 'Cloud Foundry' sections. The 'Cloud Foundry' section includes fields for Org Name, Org ID, Members, and API Endpoint.

3. Click **New Destination**.

The screenshot shows the SAP Cloud Platform Cockpit interface. The left sidebar has a 'Destinations' section highlighted with a red box. The main content area displays 'Subaccount: trial - Destinations' with a table showing three destinations. A red box highlights the 'New Destination' button in the top navigation bar.

4. Give the following details:

Field Name	Value
Name	BUSINESS_RULES
Type	HTTP
Description	Business Rule API
URL	https://bpmruleruntime.cfapps.eu10.hana.ondemand.com/rules-service
Proxy Type	Internet
Authentication	OAuth2ClientCredentials
Client ID	Client Id from the service keys of your business rules instance. Reference: Step 1: Get Parameters of Business Rule Instance
Client Secret	Client Secret from the service keys of your business rules instance. Reference: Step 1: Get Parameters of Business Rule Instance
Token Service URL	{URL}/oauth/token URL taken from the service keys of your business rules instance. Reference: Step 1: Get Parameters of Business Rule Instance

5. Choose Save

Destination Configuration Blank Template Service Instance

Name: * BUSINESS_RULES

Type: HTTP

Description: Business Rule API

URL: * <https://bpmruleruntime.cfapps.eu10.hana.ondemand.com/rules-service>

Proxy Type: Internet

Authentication: OAuth2ClientCredentials

Client ID: * sb-clone-e0c6c161-c542-4a08-926b-3faab50...

Client Secret: * *****

Token Service URL: * <https://e1364071trial.authentication.eu10.hana.o>

Token Service User:

Token Service Password:

Additional Properties New Property

Use default JDK truststore

Save
Cancel

6. A Destination with name **BUSINESS_RULES** should be created.

Purchase Order Approval Process | 39

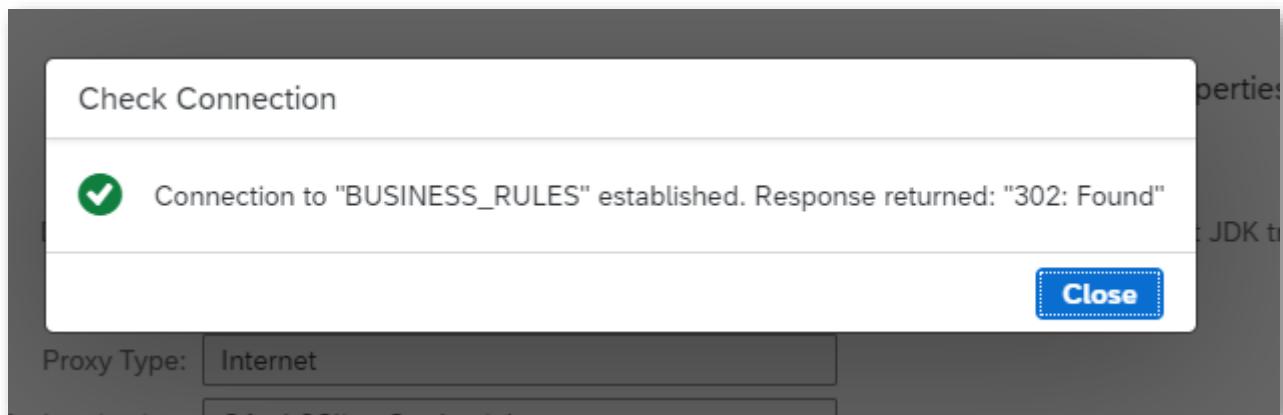
7. Click **Check Connection** to make sure that everything is working.

Destination Configuration

Name: [*]	BUSINESS_RULES	Additional Properties	New
Type:	HTTP		
Description:	Business Rule API	<input checked="" type="checkbox"/> Use default JDK truststore	
URL: [*]	https://bpmruleruntime.cfapps.eu10.hana.ond...		
Proxy Type:	Internet		
Authentication:	OAuth2ClientCredentials		
Client ID: [*]	sb-clone-e0c6c161-c542-4a08-926b-3faab50...		
Client Secret: [*]	*****		
Token Service URL: [*]	https://e1364071trial.authentication.eu10.han...		
Token Service User:			
Token Service Password:			

Edit **Clone** **Export** **Delete** **Check Connection**

8. You will get confirmation that the connection is established.



[I] Set Up SAP Business Application Studio for Development

Step 1: Subscribe SAP Business Application Studio

1. Go back to your trial subaccount by choosing the **trial** from the breadcrumbs.
2. In the **Subscriptions** page, search for **studio**.
3. Click the **SAP Business Application Studio** tile.

The screenshot shows the SAP Cloud Platform Cockpit interface. On the left, there's a sidebar with links like Overview, Spaces, Subscriptions (which is selected and highlighted in blue), Connectivity, Security, Quota Plans, Entitlements, and Members. The main content area is titled "Subaccount: trial - Subscriptions" and shows "Filtered: 1 of 18". Below this, under "SaaS Applications", there's a card for "SAP Business Application Studio". The card has a thumbnail, the name "SAP Business Application Studio", a "Subscribe" button, and a description: "Develop, debug, test, and deploy SAP business applications.". A red box and a cursor icon are placed over the "Subscribe" button.

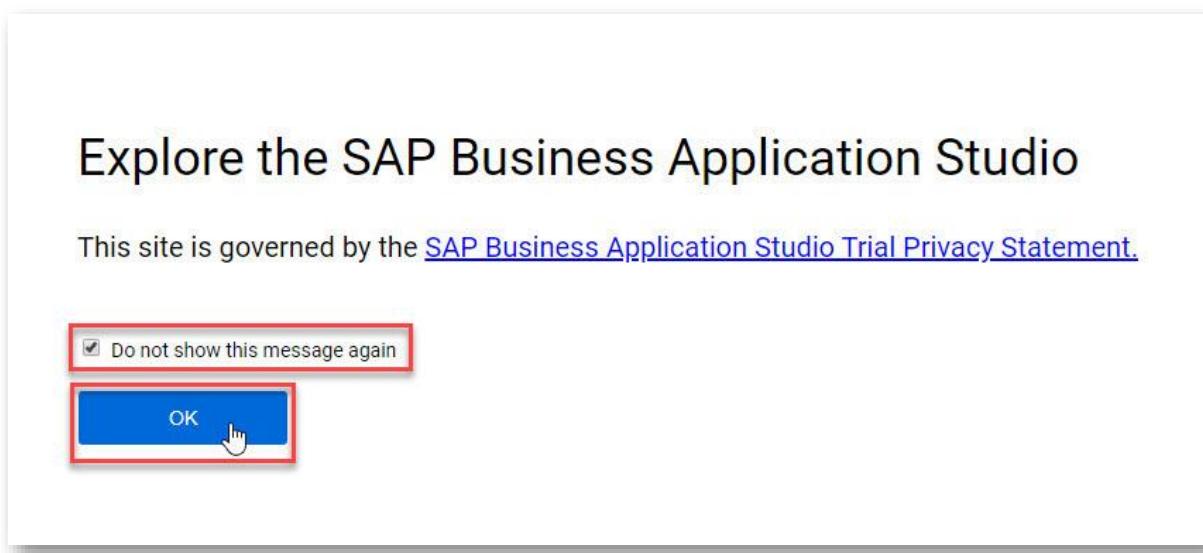
4. Click **Subscribe** to add the subscription to the subaccount.

The screenshot shows the "Subscription: SAP Business Application Studio - Overview" page. At the top, it says "Not Subscribed" and has a prominent "Subscribe" button, which is highlighted with a red box and a cursor icon. Below the button, there's an "Application Description" section with a detailed paragraph about SAP Business Application Studio. Further down, there are sections for "Documentation" and "Go to Application". At the bottom, there's an "Application Configuration" section with a "Manage Roles" link.

5. Once subscribed, Click **Go to Application**.

The screenshot shows the SAP Cloud Platform Cockpit interface. On the left, there's a sidebar with various navigation options like Overview, Spaces, Subscriptions, Connectivity, Security, Administrators, Role Collections, Trust Configuration, Quota Plans, Entitlements, and Members. The main area is titled "Subaccount: trial - Subscriptions" and shows a list of "SaaS Applications". One application, "SAP Business Application Studio", is listed with a green "Subscribed" button. Below it, a description reads: "Develop, debug, test, and deploy SAP business applications." At the bottom of this card is a blue "Go to Application" button, which is highlighted with a red box and a mouse cursor icon pointing at it.

6. You might be asked to accept the legal terms. Check the box and click **OK**.



This site is governed by the [SAP Business Application Studio Trial Privacy Statement](#).

Do not show this message again

OK

7. SAP Business Application Studio loads.

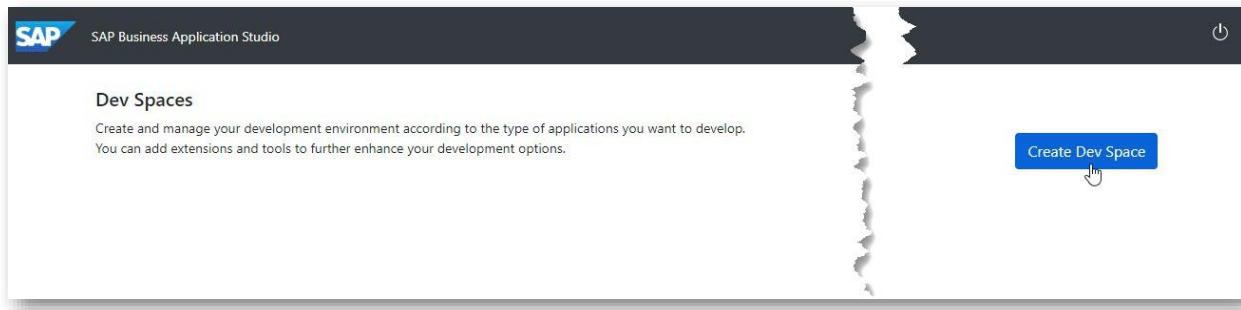
Dev Spaces

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.

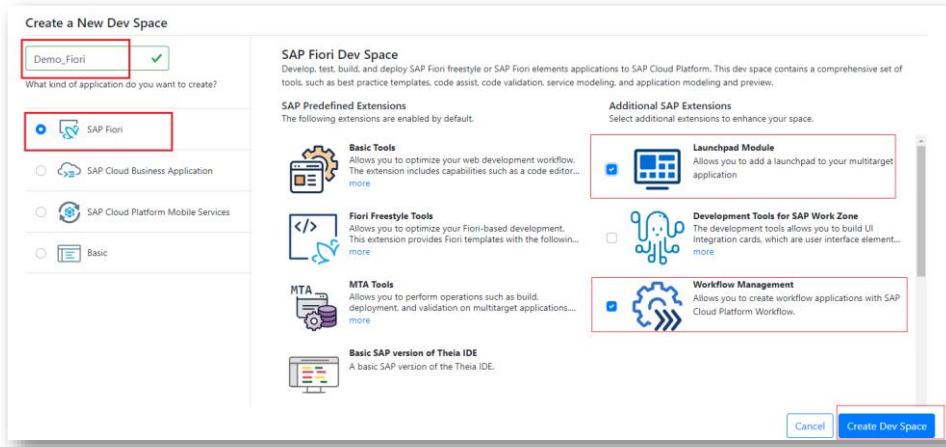
Create Dev Space

Step 2: Create a Dev Space for SAP Fiori Apps

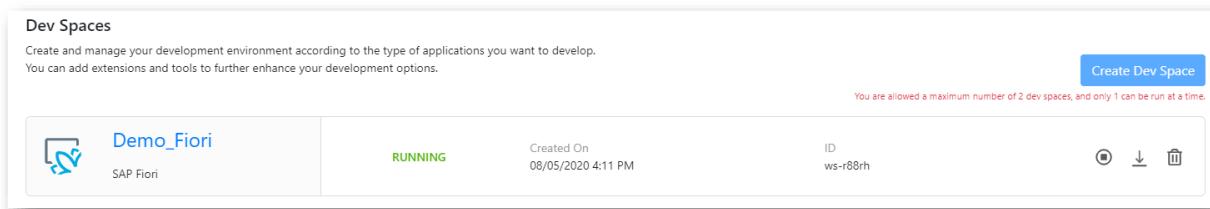
1. Choose **Create Dev Space**.



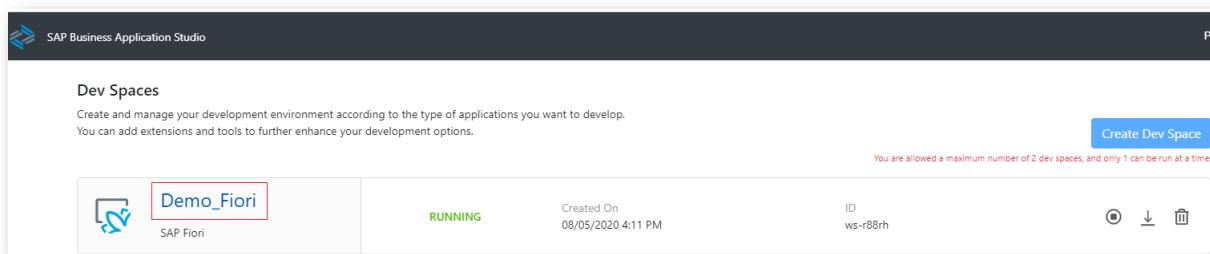
2. Enter **Demo_Fiori** for your dev space name.
3. Choose **SAP Fiori** as the application type.
4. From Additional SAP Extension select **Launchpad Module** and **Workflow management**
5. Click **Create Dev Space**



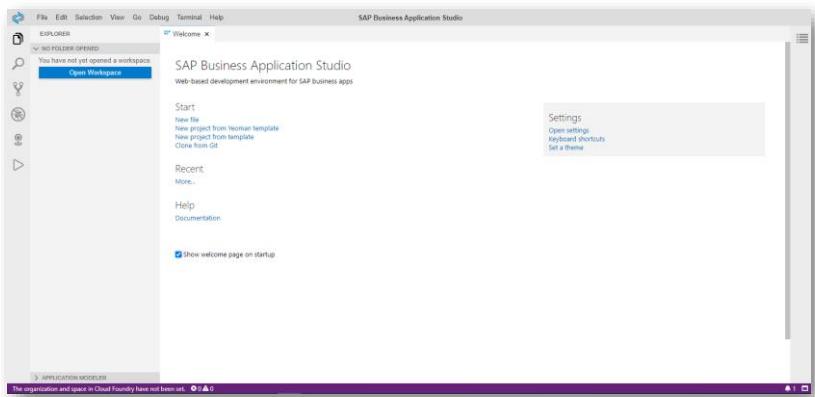
6. The dev space is in status **STARTING**. Wait until it is in status **RUNNING**



7. Click the name of the dev space you created



8. The SAP Fiori dev space opens, and the **Welcome** tab appears.

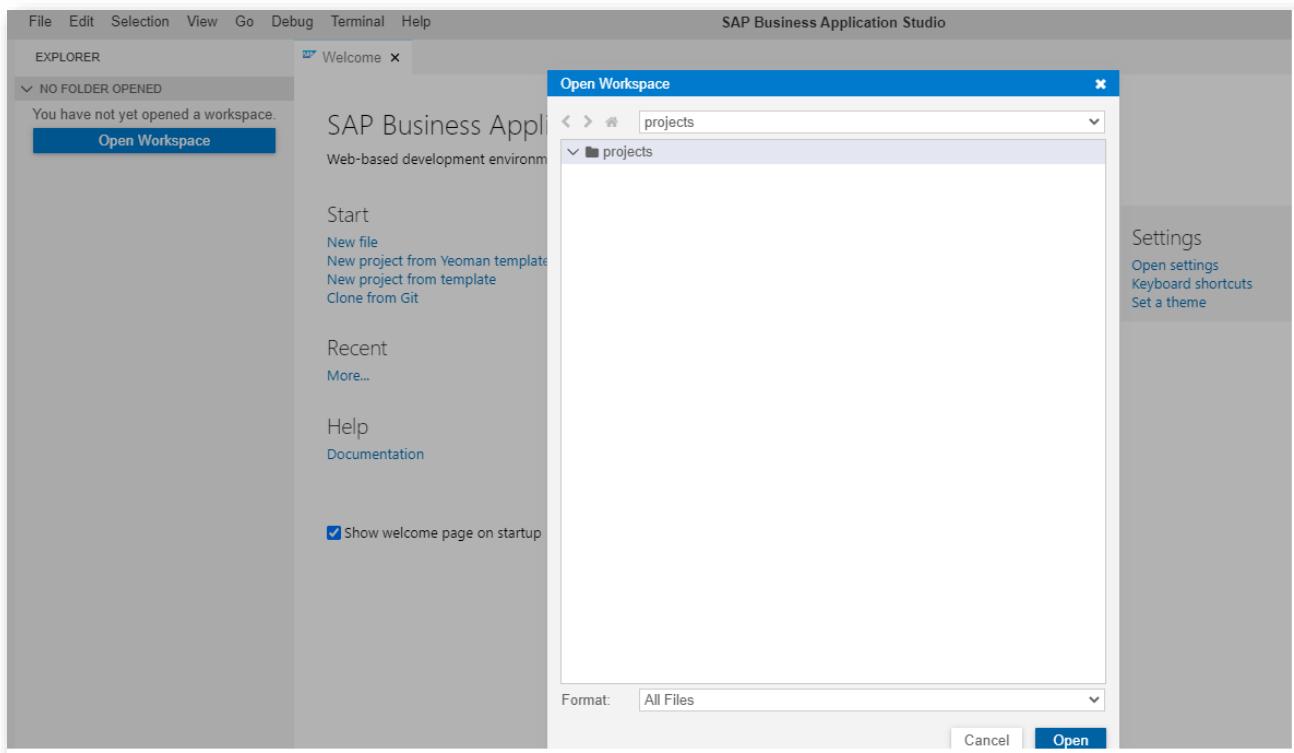


The purple color of the status bar indicates that there is no open workspace.

[J] Create, Build and Deploy Workflow Project

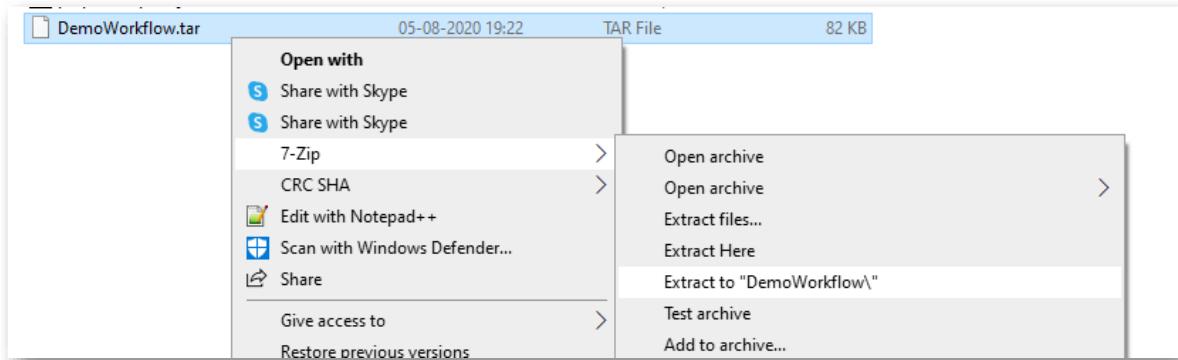
Step 1: Open a workspace in SAP Business Application Studio and Import Project

1. Click on File → Open Workspace → select Projects → Click on **Open**

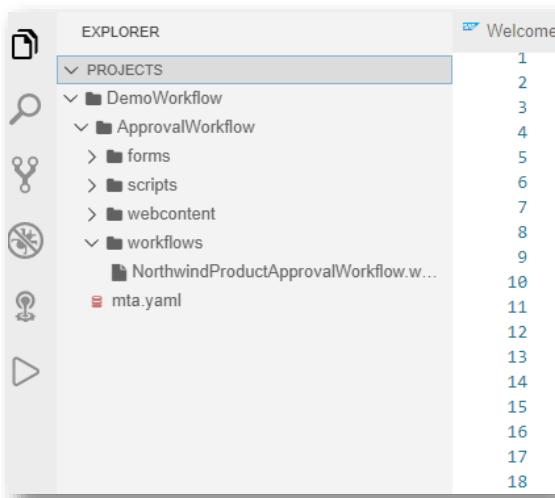


- Download the file in your local machine from below link and Extract it using 7-Zip or any relevant software.

 <https://ibm.box.com/s/fzlxtfbto28ivs9k7f2wfn5xr4ta745>

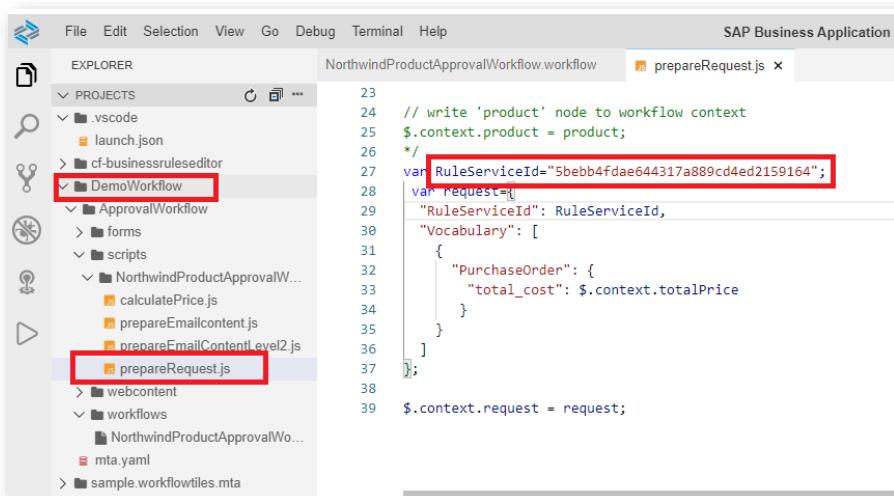


- Drag and Drop the extracted folder into just created workspace.



- Open script file **prepareRequest.js**
- Change the value of variable RuleServiceId to the ID of your Business Rule Service.

Reference: Please save the Rule Service ID. It will be required while developing workflow to call this rule service.



6. Save the changes. Ctrl+S
7. Open both the files **prepareEmailContent.js** and **prepareEmailContentLevel2.js**
8. Change the value of variable **accountID** to the ID of your trial account in both files.

```

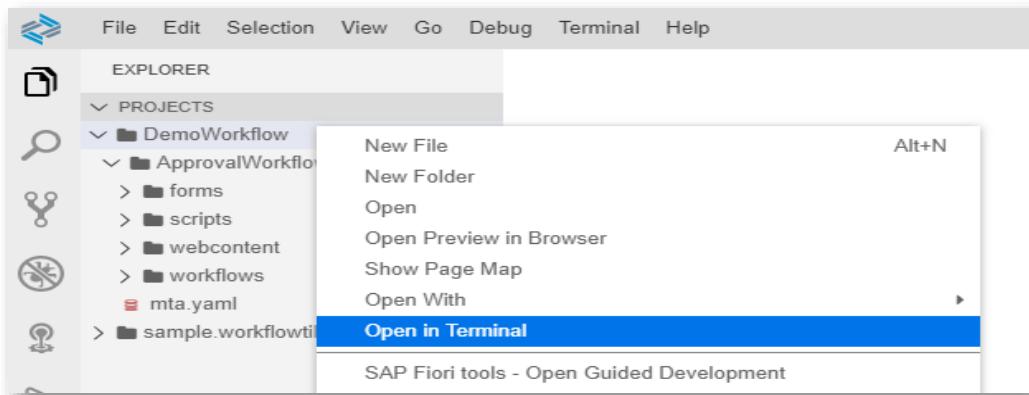
26  */
27  var accountID="████████trial";
28

```

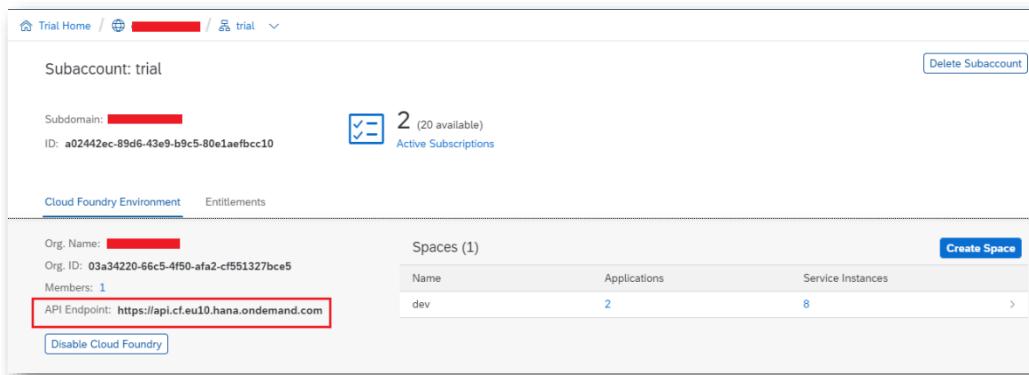
9. Save the changes.

Step 2: Build your workflow project

7. Right click on folder DemoWorkflow → select **Open in Terminal**



8. In Terminal, enter following command to login to your CF account: **\$ cf login**
9. Enter API endpoint. You can get API endpoint details from your SAP cloud account.



10. Enter your registered username
11. Enter Password

```

Problems > user@workspaces-ws-r88rh-deployment-6bcc9fbcbc-6qb92: ~/projects/DemoWorkflow x
user: DemoWorkflow $ cf login
API endpoint: https://api.cf.eu10.hana.ondemand.com

Email: [REDACTED]
Password:
Authenticating...
OK

Targeted org [REDACTED]

Targeted space dev

API endpoint: https://api.cf.eu10.hana.ondemand.com (API version: 3.82.0)
User: [REDACTED]@gmail.com
Org: [REDACTED]
Space: dev
user: DemoWorkflow $ 

```

12. In Terminal, Enter Command: **\$ mbt build**

13. The MTA archive gets generated at

/home/user/projects/DemoWorkflow/mta_archives/mta_0.0.1.mtar

```

user: DemoWorkflow $ mbt build
[2020-08-05 14:07:29] INFO Cloud MTA Build Tool version 1.0.15
[2020-08-05 14:07:29] INFO generating the "Makefile_20200805140729.mta" file...
[2020-08-05 14:07:29] INFO executing the "make -f Makefile_20200805140729.mta p=cf mtar= strict=true mode=" command...
[2020-08-05 14:07:29] INFO validating the MTA project
[2020-08-05 14:07:29] INFO building the "ApprovalWorkflow" module...
[2020-08-05 14:07:29] INFO the build results of the "ApprovalWorkflow" module will be packaged and saved in the "/home/user/projects/DemoWorkflow/.DemoWorkflow_mta_build_tmp/ApprovalWorkflow" folder
[2020-08-05 14:07:29] INFO finished building the "ApprovalWorkflow" module
[2020-08-05 14:07:29] INFO generating the metadata...
[2020-08-05 14:07:29] INFO generating the "/home/user/projects/DemoWorkflow/.DemoWorkflow_mta_build_tmp/META-INF/mtad.yaml" file...
[2020-08-05 14:07:29] INFO generating the MTA archive...
[2020-08-05 14:07:29] INFO the MTA archive generated at: /home/user/projects/DemoWorkflow/mta_archives/mta_0.0.1.mtar
[2020-08-05 14:07:29] INFO cleaning temporary files...
user: DemoWorkflow $ 

```

Step 3: Deploy your workflow project

1. In Terminal, enter Command: **\$ cf deploy mta_archives/mta_0.0.1.mtar**

2. Your application will be deployed to your Cloud Foundry platform.

```

Problems > user@workspaces-ws-r88rh-deployment-6bcc9fbcbc-6qb92: ~/projects/DemoWorkflow x
user: DemoWorkflow $ cf deploy mta_archives/mta_0.0.1.mtar
Deploying multi-target app archive mta_archives/mta_0.0.1.mtar in org [REDACTED] / space dev as [REDACTED]...
Uploading 1 files...
/home/user/projects/DemoWorkflow/mta_archives/mta_0.0.1.mtar
OK
Operation ID: bb107be8-d726-11ea-a5a9-eeee0a8d4cce
Deploying in org "[REDACTED]" and space "dev"
Detected MTA schema version: "3"
No deployed MTA detected - this is initial deployment
Detected new MTA version: "0.0.1"
Service key "ApprovalWorkflow-my-workflow-instance-credentials" for service "my-workflow-instance" already exists
Uploading content module "ApprovalWorkflow" in target service "my-workflow-instance"...
Deploying content module "ApprovalWorkflow" in target service "my-workflow-instance"...
Skipping deletion of services, because the command line option "--delete-services" is not specified.
Process finished.
Use "cf dmol -i bb107be8-d726-11ea-a5a9-eeee0a8d4cce" to download the logs of the process.
user: DemoWorkflow $ 

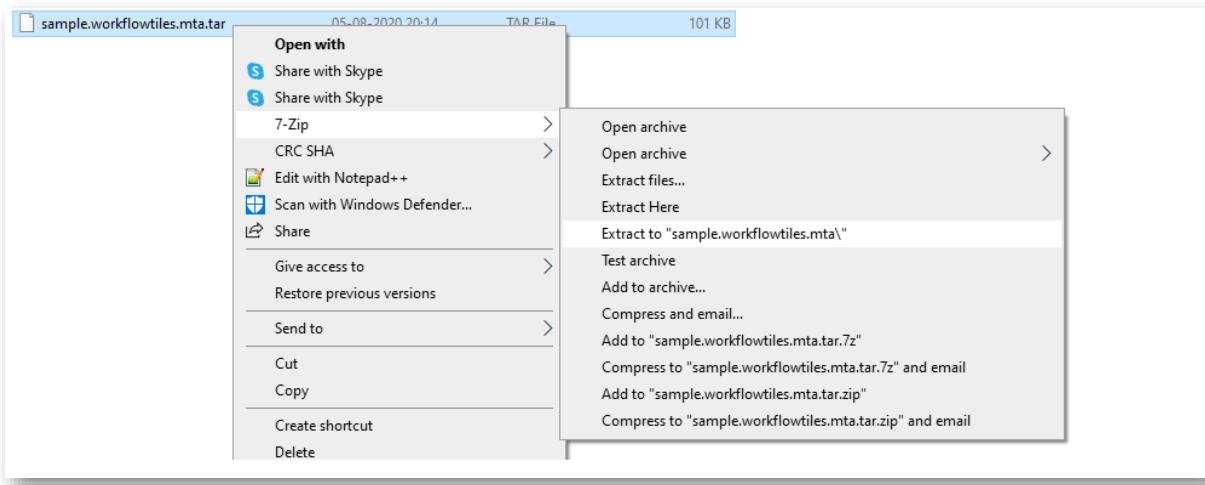
```

[K] Create Build and Deploy SAP Fiori Launchpad Project and its Module

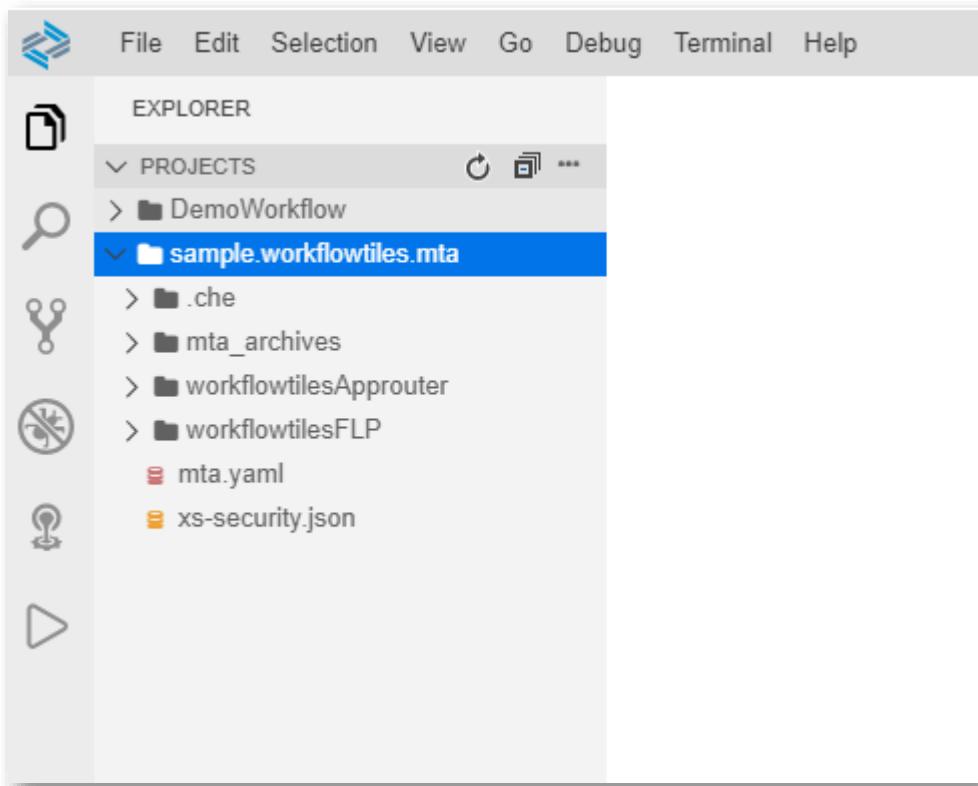
Step 1: Import Project

1. Download the file in your local machine from below link and Extract it using 7-Zip or any relevant software.

 <https://ibm.box.com/s/junl25pal98vz6m6mbpx82on0ppo2so7>



2. Drag and Drop the extracted folder into workspace.



Step 2: Build Project

1. Right click on folder sample.workflowtiles.mta → select **Open in Terminal**
2. In Terminal, Enter Command: **\$ mbt build**
3. The MTA archive gets generated at
`/home/user/projects/sample.workflowtiles.mta/mta_archives/sample.workflowtiles.mta_0.0.1.mtar`

Step 3: Deploy project

1. In Terminal, enter Command: **\$ cf deploy mta_archives/sample.workflowtiles.mta_0.0.1.mtar**

```
Problems      user@workspaces-ws-r88rh-deployment-6bcc9fbcbc-6qb92: ~/projects/sample.workflowtiles.mta ×
user: sample.workflowtiles.mta $ cf deploy mta_archives/sample.workflowtiles.mta_0.0.1.mtar █
```

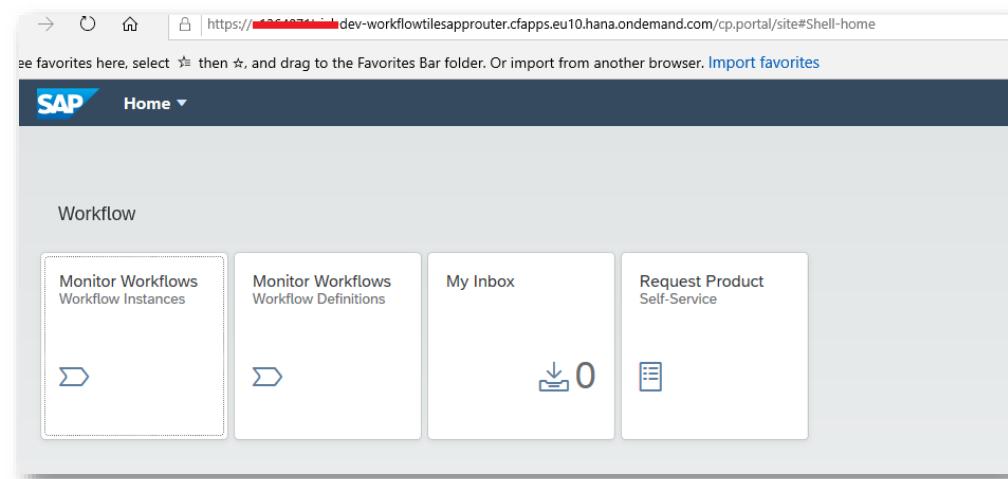
2. Your application will be deployed to your Cloud Foundry platform.

Step 4: Access your SAP Fiori launchpad apps

3. Open the console, and search for the launchpad URL <https://<dev space name>-trial-dev-workflowtilesapproouter.cfapps.<your endpoint>.hana.ondemand.com>

```
Uploading application "workflowtilesApproouter"...
Scaling application "workflowtilesApproouter" to "1" instances...
Staging application "workflowtilesApproouter"...
Application "workflowtilesApproouter" staged
Starting application "workflowtilesApproouter"...
Application "workflowtilesApproouter" started and available at "████████-dev-workflowtilesapproouter.cfapps.eu10.hana.ondemand.com"
Creating application "workflowtilesFLP" from MTA module "workflowtilesFLP"...
Uploading application "workflowtilesFLP"...
Scaling application "workflowtilesFLP" to "1" instances...
Staging application "workflowtilesFLP"...
Application "workflowtilesFLP" staged
Executing task "deploy" on application "workflowtilesFLP"...
Skipping deletion of services, because the command line option "--delete-services" is not specified.
Process finished.
Use "cf dm01 -i f6c8d16b-d72c-11ea-a5a9-eeee0a8d4cce" to download the logs of the process.
user: sample.workflowtiles.mta $ █
```

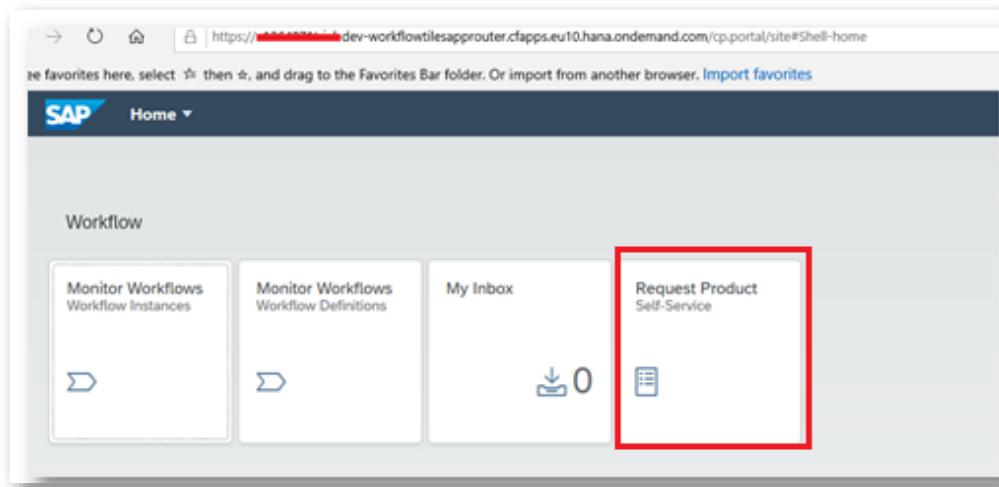
4. Copy the URL to your browser.
5. Log on to your trial account by entering your email address and password. Your home page of SAP Fiori launchpad is displayed.



[L] Testing Workflow Scenario

Submit request for Purchase Order

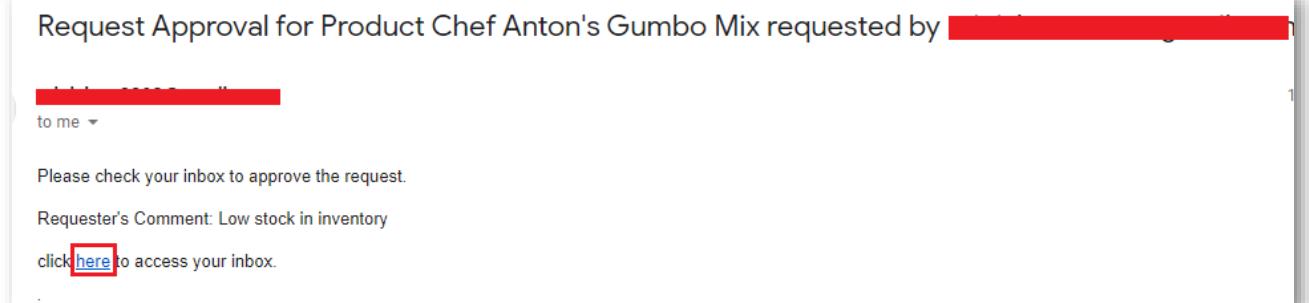
1. Open your SAP Fiori launchpad in browser and click application 'Request Product'



2. Fill the form and submit it by clicking on 'Order Product'. As soon as the form is submitted, workflow will be triggered.

The screenshot shows the 'Request Product' application in detail. The header says 'Request Product'. The main section is titled 'Request Your Product'. Below it, 'Product Details' is shown with three input fields: 'Product Name:' containing 'Chef Anton's Gumbo Mix', 'Quantity:' containing '12', and 'Requester's Comments:' containing 'Low stock in inventory'. At the bottom right of the form is a blue button labeled 'Order Product'.

- Depending upon your business rule, level 1 approver will get the approval request email with a link to his inbox to make his decision within assigned time window. [for demo, we have kept the waiting time to 4 minutes]



- When the link shown in email is clicked, it takes the approver to the task in his inbox. The approval form shows extra details about the product such as calculated total cost, its supplier details.

The screenshot shows the SAP My Inbox interface with the title "Request Approval for Product Chef Anton's Gumbo Mix". The task details include:

- Created On: 14-Aug-2020
- Created By: [REDACTED]
- Priority: **High** (highlighted with a red box)
- Product Details:

Product Id:	5
Product Name:	Chef Anton's Gumbo Mix
Quantity:	12
Product Unit Price:	21.00
Total Amount:	252.00
- Supplier Details:

Name:	Shelley Burke
Designation:	Order Administrator
Address:	P.O. Box 78934 New Orleans USA 70117

At the bottom right are buttons for Approve, Reject, Show Log, and Claim.

- If level 1 approver does not make any decision within allocated time window,
 - The approval task for the Purchase order is delegated to level 2 approver with higher priority.
 - A notification email is sent to both Level 1 approver and requester about the same.
 - Parallelly Level2 approver also gets the email notification about the request with a link to his inbox.

Approval request Moved to Level 2 Approver Inbox X

to me ▾ 16:32 (0 minutes ago)
Automated Email
The task for approving request for product 'Chef Anton's Gumbo Mix' requested by [REDACTED] has been delegated to level 2 approver : [REDACTED]

Request Approval for Product Chef Anton's Gumbo Mix requested by [REDACTED]

Please check your inbox to approve the request.

Requester's Comment: Low stock in Inventory

click [here](#) to access your inbox.

SAP My Inbox ▾

All Tasks (1)

Search

Request Approval for Product Chef Anton's Gumbo Mix

Created On: 14-Aug-2020

Created By: [REDACTED]

Priority: **Very High**

Product Details Supplier Details Comments

Product Id: 5

Product Name: Chef Anton's Gumbo Mix

Quantity: 12

Product Unit Price: 21.00

Total Amount: 252.00

Supplier Details

Name: Shelley Burke

Designation: Order Administrator

Address: P.O. Box 78934 New Orleans USA 70117

Phone Number: (100) 555-1232

Approve Reject Show Log Claim