

SAP BUSINESS TECHNOLOGY PLATFORM | EXTERNAL

Setup Guide Authorization For Expenditure using SAP Workflow Management

Table of Contents

Table of Contents	2
Overview.....	3
1. Objectives	3
2. Benefits.....	3
Required SAP Business Technology Platform Services	4
Setup and Configuration	5
Configure SAP Workflow Management.....	5
Configure Workflow Email Destination.....	5
Configure OAuth2ClientCredentials Workflow Destination	5
Configure OAuth2UserTokenExchange Workflow Destination	6
Configure OAuth2ClientCredentials Business Rules Destination.....	6
Configure Destination to Enable Start & Step Conditions	7
Configure OAuth2 Client Credentials Workflow Destination (Service Instance).....	7
Configure Cloud Integration Destination	7
Configure SAP S/4HANA Destination.....	8
Configure APIs in SAP S/4HANA	8
Configure RFC Destination.....	9
Configure Cloud Connector	9
Import, configure and deploy cloud integration content	10
Import pre-packaged Integration content in SAP Integration Suite	11
HTTPS Adapter Configuration	12
Configure Document Management Service Repository	14
Configure Document Management Service Destination	15
Configure SAP Central Fiori Launchpad Site	16
Deploy Custom UIs and Workflow module	16
Configure AFE Planner Tile on Central Fiori Launchpad Site	16
Deploy Custom ABAP Objects.....	17

Overview

Authorization For Expenditure (AFE) is common in Upstream Oil and Gas industry and used to approve, control, and monitor high value investments in Capital and Operational Expenditure processes. AFEs are created at an Oil / Gas well level and there can be many AFEs for a particular well. These AFEs can be used for well development, maintenance etc. There are internal and Oil and Gas Joint Venture partner approvals needed before AFE can be taken up for execution

Scenario Definition

1. Objectives

- Predefined WBS to plan and capture the expense and Plan for Gross AFE value

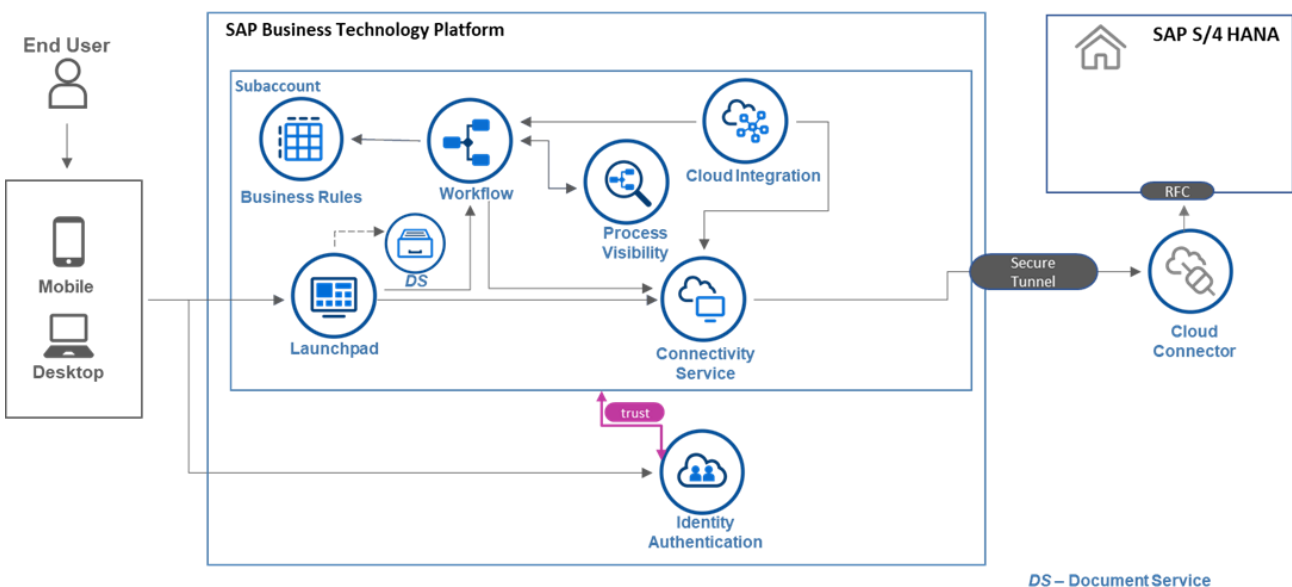
2. Benefits

- Monitoring and Controlling High Value Investments being made by Oil and Gas / Mining Operator Companies on the behalf of Joint Venture Partner by establishing a rigorous process of Authorization and approval prior to incurring investments. This process establishes transparency between Operators and JV Partners

Salient features of this content package are:

- Plug and Play with SAP S/4HANA without additional development.
- Pre-delivered process steps to create new variants. New Process variants can be configured in a low-code, no-code approach.
- Agent/approver determination using Business Rules or external service.
- Flexibility in determining process variants based on business conditions.
- Automatic email notification to parties involved
- Pre-built integration content to call SAP S/4 HANA from SAP Workflow Management
- Out-of-the-box visibility into key process performance indicators.

Authorization For Expenditure Solution Diagram:



Required SAP Business Technology Platform Services

The workflow content package Authorization for Expenditure is intended to be used for SAP S/4HANA and requires the following services in SAP BTP:

- SAP Workflow Management to orchestrate the process.
- SAP Integration Suite for data activities with AFE Information.
- SAP Connectivity service (cloud connector) to establish access to SAP S/4HANA.
- SAP Document Management Service, Integration Option
- SAP Launchpad service to access the apps that are involved in the process.
- SAP Business Application Studio to modify/deploy the SAPUI5 applications.
- SAP BTP, Cloud Foundry runtime.

Setup and Configuration

Configure SAP Workflow Management

Authorization for Expenditure content package requires SAP Workflow Management subscription or a CPEA contract. Follow the setup and configuration section of SAP Workflow Management.

<https://help.sap.com/viewer/6f55baaf330443bd8132d071581bbae6/Cloud/en-US/d7910e2bf7f64afc9d0eb21b0cc9e84d.html>

Configure Workflow Email Destination

Configure workflow email destination to automatically send email notification to the involved parties. For more information on configuring the destination, see [configure workflow email destination](#).

Configure OAuth2ClientCredentials Workflow Destination

A HTTP destination is required in the BTP subaccount where SAP Workflow Management is subscribed. Create a destination with name "Workflow" with the following configuration, if it doesn't exist already. Please refer how to [create a HTTP destination](#) OAuth 2.0 Authentication (client credentials).

Name	Workflow
Type	HTTP
Proxy Type	Internet
Authentication	OAuth2ClientCredentials
URL	<rest_api_url>
Client ID	<client ID>
Client Secret	<client secret>
Token Service URL	<uaa.url>/oauth/token

Note: While creating the service instance for Workflow service, make sure that at least the following scopes are assigned (help documentation to [enable technical authentication](#) to access the workflow APIs). If the scopes are not assigned, you can also [update the service instance](#) with the following scopes.

- WORKFLOW_INSTANCE_START
- WORKFLOW_INSTANCE_UPDATE_CONTEXT
- WORKFLOW_INSTANCE_GET
- MESSAGE_SEND

Please refer help documentation how to get [URL](#), [Client ID](#), [Client Secret](#) and [Token Service URL](#). For more information refer to [how to create a HTTP destination](#) and [how to use Workflow APIs](#).

Configure OAuth2UserTokenExchange Workflow Destination

A HTTP destination is required in the BTP subaccount where SAP Workflow Management is subscribed. Create a destination with name "WorkflowActions" with the following configuration, if it doesn't exist already. Please refer how to [create a HTTP destination](#).

Name	WorkflowActions
Type	HTTP
Proxy Type	Internet
Authentication	OAuth2UserTokenExchange
URL	<rest_api_url>
Client ID	<client ID>
Client Secret	<client secret>
Token Service URL	<uaa.url>/oauth/token

Configure OAuth2ClientCredentials Business Rules Destination

A HTTP destination is required in the Cloud Foundry account where SAP Workflow Management is subscribed. Create a destination with name "BUSINESS_RULES" with the following configuration, if it doesn't exist already. Please refer how to [create a HTTP destination](#) and [how to access business rules APIs](#) using OAuth 2.0 Authentication (client credentials)

Name	BUSINESS_RULES
Type	HTTP
Proxy Type	Internet
Authentication	OAuth2ClientCredentials
URL	<rule_runtime_url>/rules-service
Client ID	<client ID>
Client Secret	<client secret>
Token Service URL	<uaa.url>/oauth/token

Configure Destination to Enable Start & Step Conditions

To enable the usage of start conditions and step conditions on a process variant, create a destination for business rules with the configuration as mentioned in the following help document:

https://help.sap.com/viewer/6f55baaf330443bd8132d071581bbae6/Cloud/en-US/543b5dbd77d940b4b1f972298b559911.html?q=WM_BUSINESSRULES

Configure OAuth2 Client Credentials Workflow Destination (Service Instance)

Similarly, create new Destination to call Workflow Service APIs using a Service route from SAP UI5 Component. For more details, follow the official help document:

<https://help.sap.com/viewer/cca91383641e40ffbe03bdc78f00f681/Cloud/en-US/685f383cebb54c009b2fac633b32c90f.html>

Configure Cloud Integration Destination

To call an integration flow, a HTTP destination is required in the SAP BTP tenant where the SAP Workflow Management is subscribed. Create a destination called CPI with either Basic Authentication or OAuth2ClientCredentials.

Destination with OAuth2ClientCredentials Authentication

Name	CPI
Type	HTTP
Proxy Type	Internet
Authentication	OAuth2ClientCredentials
URL	<runtime.url>
Client Id	<client ID>
Client Secret	<client secret>
Token Service URL	<oauth.url.for.clientCredentials>

Additional Properties to Destination

Additionally, add the following properties in the destination for cloud integration.

WebIDEEEnabled	true
WebIDESystem	CPI
WebIDEUsage	odata_gen

Configure SAP S/4HANA Destination

Configure a S/4 HANA destination to connect with SAP S/4HANA .

Name	S4HANA
Type	HTTP
Proxy Type	On-Premise
User	<ONPREMISE_USER>
Password	<ONPREMISE_PASSWORD>
Authentication	BasicAuthentication
URL	<OData base URL of SAP S/4HANA>
Additional Properties	sap-client: <client number>

Configure APIs in SAP S/4HANA

Following APIs are needed to be configured in SAP S/4HANA to use the content package.

`/sap/opu/odata/sap/API_COMPANYCODE_SRV`

`/sap/opu/odata/sap/API_COSTCENTER_SRV`

`/sap/opu/odata/sap/API_PROFITCENTER_SRV`

`/sap/opu/odata/sap/ZWF_PROJECTS_CDS`

`/sap/opu/odata/sap/ZWF_STD_WBS_SRV`

`/sap/opu/odata/sap/ZWF_PROJECT_STATUS_CDS`

`/sap/opu/odata/sap/ZWF_PROJECT_TYPE_CDS`

Steps to Register OData Services in SAP Gateway

1. Go to t-code “/IWFND/MAINT_SERVICE”
2. Click on “Add Service”
3. Select the required System Alias (Select LOCAL as system alias in case of Embedded Deployment of Gateway)
4. Enter Technical Service Name as “API_COMPANYCODE_SRV” and click on “Get Services”
5. Select “API_COMPANYCODE_SRV” and click on “Add Selected Services”
6. Enter the required package and click on OK
7. Repeat steps 1 to 6 for Technical Service “API_COSTCENTER_SRV” and “API_PROFITCENTER_SRV”

Note: Steps to implement the custom OData services is mentioned in the section “Deploy Custom ABAP Objects” in this document.

Following BAPIs/RFCs needed to be configured in SAP S/4HANA to use the content package:

BAPI_PROJECT_MAINTAIN

ZWF_RFC_PS_SET_STATUS

ZWF_RFC_PS_UPDATE_BUDGET

Configure RFC Destination

Configure a RFC destination to connect with SAP S/4HANA on-premise. Below is a destination configuration for *SAP S/4HANA on-premise*.

Note: This destination is required by Cloud Platform Integration.

Name	<RFC_DESTINATION_NAME>
Type	RFC
Proxy Type	OnPremise
User	<ONPREMISE_USER>
Password	<ONPREMISE_PASSWORD>
Repository User	<ONPREMISE_USER>
Repository Password	<ONPREMISE_PASSWORD>

Additional Properties	jco.client.ashost: <host>
Additional Properties	jco.client.client:<client number>
Additional Properties	jco.client.lang: <language>
Additional Properties	jco.client.sysnr:<system number >

Configure Cloud Connector

For SAP S/4HANA on-premise landscape, configure cloud connector to enable secure tunnel to SAP BTP tenant. Please refer the help documentation to [configure Cloud Connector](#).

Services/Resources that need to be exposed from SAP S/4HANA on-premise using Cloud Connector.

List of BAPIs which need to be configured in cloud connector

Resources	Protocol	Backend-Type
/sap/opu/odata/sap/API_COSTCENTER_SRV	HTTPS	ABAP System
/sap/opu/odata/sap/API_PROFITCENTER_SRV	HTTPS	ABAP System

/sap/opu/odata/sap/ZWF_PROJECTS_CDS	HTTPS	ABAP System
/sap/opu/odata/sap/ZWF_STD_WBS_SRV	HTTPS	ABAP System
/sap/opu/odata/sap/ZWF_PROJECT_STATUS_CDS	HTTPS	ABAP System
/sap/opu/odata/sap/ZWF_PROJECT_TYPE_CDS	HTTPS	ABAP System
BAPI_PROJECT_MAINTAIN	RFC	ABAP System
ZWF RFC_PS_SET_STATUS	RFC	ABAP System
ZWF RFC_PS_UPDATE_BUDGET	RFC	ABAP System

Import, configure and deploy cloud integration content

This workflow content requires the cloud integration to process the – Authorization for Expenditure in SAP S/4HANA. The integration content package **SAP Workflow Management Integration with SAP S/4HANA – Authorization For Expenditure** is available in SAP API Business hub to integrate SAP Workflow Management with SAP S/4HANA. Integration models use RFC to integrate with SAP S/4HANA. The following integration models are available in this package.

1. Create WBS Elements
2. Fetch Project Status
3. Update the Project Status
4. Update the WBS Budget

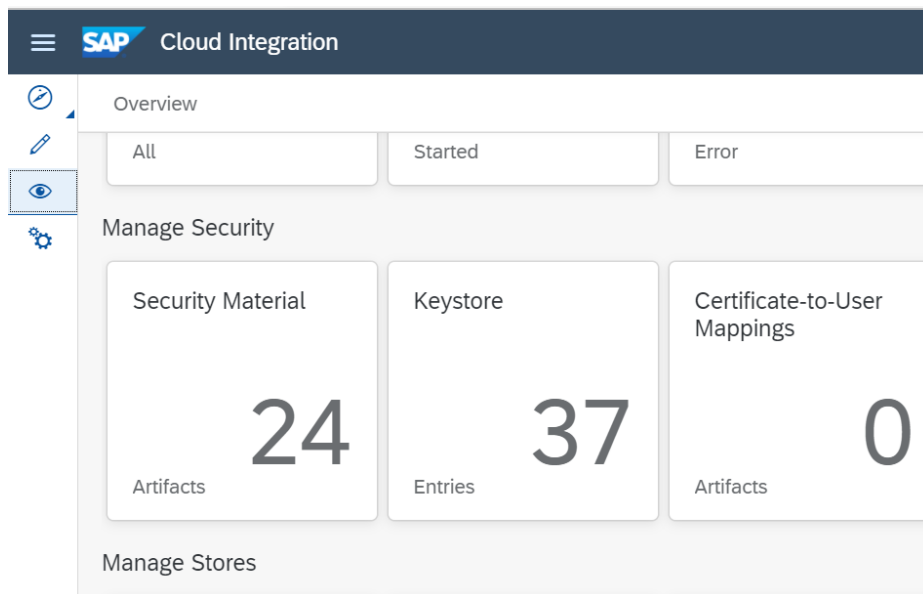
The screenshot displays the SAP API Business Hub interface for the integration package "SAP Workflow Management Integration with SAP S/4HANA – Authorization For Expenditure". The package is used in "Authorization for Expenditure Workflow Management Content", has a vendor of "Accenture", and is in "Editable" mode with version "1.0.0". The "Artifacts (4)" tab is selected, showing a table of integration flows:

Name	Type	Version
Create WBS Elements Creates WBS Element for Project from SAP Workflow Management to SAP S/4 HANA Created	Integration Flow	1.0.0
Fetch Project Status Fetches Project Statuses from SAP S/4HANA Created	Integration Flow	1.0.0
Update the Project Status API to update Status of Project in SAP S/4 HANA Created	Integration Flow	1.0.0
Update the WBS Budget API to update Budget of Project in SAP S/4 HANA Created	Integration Flow	1.0.0

Import the integration package to your SAP Cloud Integration tenant. To be able to import and deploy integration flows, you need the role AuthGroup.IntegrationDeveloper (in Neo environment) or PI_Integration_Developer (in cloud foundry environment) assigned in your tenant.

Import pre-packaged Integration content in SAP Integration Suite

- Access your SAP Integration Suite tenant management node (<https://<integrationtenant>/itspaces>).
- View all pre-packaged integration flow under Discover->Integration. (<https://<integrationtenant>/itspaces/shell/discover>).
- Search content package “SAP S/4HANA Integration with SAP Workflow Management – Lease Termination”.
- Click on the package “SAP S/4HANA Integration with SAP Workflow Management – Approval For Expenditure”.
- Click Copy to import the Integration content package to your workspace.
- Navigate to the *Monitor* view (<https://<integrationtenant>/itspaces/shell/monitoring>) to setup the security materials required for the package.
- Deploy the following credentials using the Security Material app. In Integration Suite, open Operations view, then click on Security Material to create and deploy security materials.



- S4HANA – (User Credentials)

Create User Credentials

Name: *

Description:

Type: *

User: *

Password:

Repeat Password:

HTTPS Adapter Configuration

Open the integration model **Create WBS Elements**

- Click **Configure** button, choose the appropriate Sender and set their User Role

Sender
Receiver
More

Sender:

Adapter Type:

Connection

User Role:

- Save and Deploy the integration model.
- Similarly, configure the *Update the WBS Budget and Update the Project Status* integration models and deploy them.
- **RFC and OData Adapter Configuration** Open the integration model **Update the WBS Budget** Click **Configure** button, choose the appropriate receiver (RFC) and set their respective destination credentials.

Sender
Receiver
More

Receiver:

Adapter Type:

Connection

Destination:

- Save and Deploy the integration model.

- Similarly, configure the *Create WBS Elements and Update the Project Status* integration models and deploy them.
- Open the integration model *Fetch Project Status*.
- Click **Configure** button, choose receiver (SAP_S4HANA) and set the required endpoint and credential names.

Configure "Fetch Project Status"

Sender Receiver More

Receiver: SAP_S4HANA

Adapter Type: HTTP

Connection

Address: {{OData_URL}}/sap/opu/odata/sap/\${property.ServiceName}/\${property.ServiceEntity}

OData_URL: http://...:

Proxy Type: On-Premise

Location ID:

Authentication: Basic

Credential Name:

- Go to *More* tab and enter the OData Service Name, Service Entity and SAP Client

Configure "Fetch Project Status"

Sender Receiver More

Type: All Parameters

SAPClientNo:

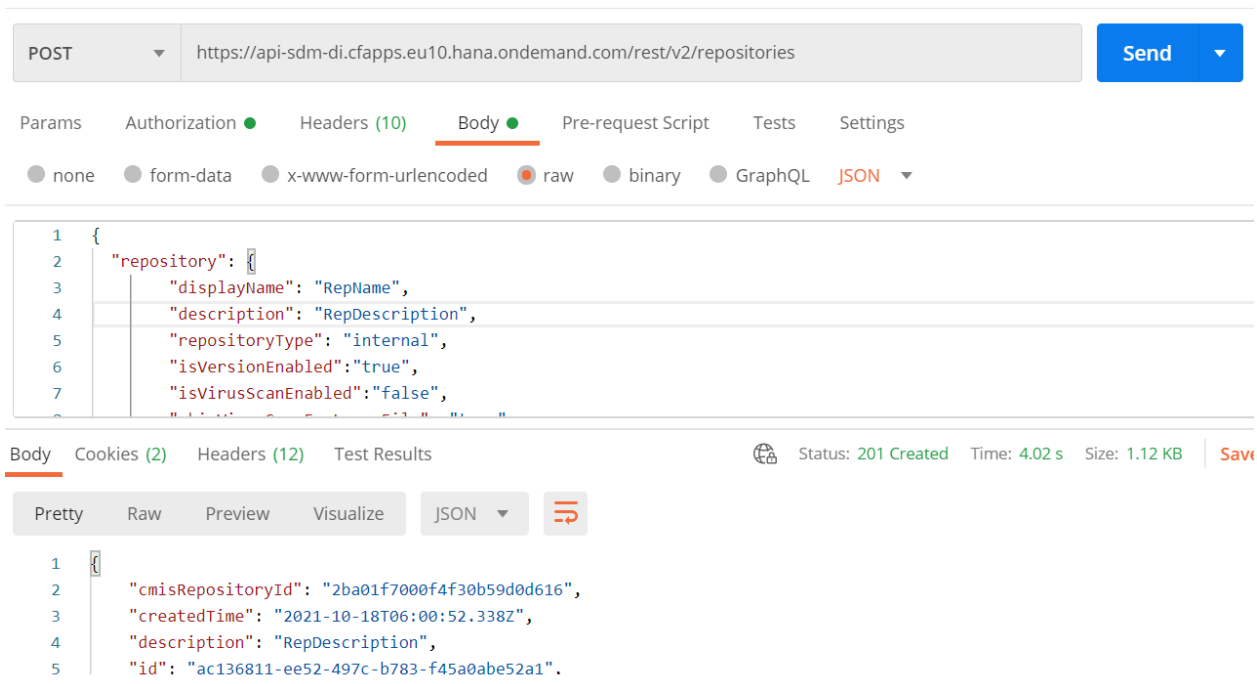
ServiceEntity: ZWF_PROJECT_STATUS

ServiceName: ZWF_PROJECT_STATUS_CDS

Note: The Service Name "ZWF_PROJECT_STATUS_CDS" and Function Import Name "ZWF_PROJECT_STATUS" will be the same as mentioned in the screenshot unless the names of these ABAP objects were changed while implementing the custom ABAP objects as mentioned in section "Deploy Custom ABAP Objects" in Setup Guide of the workflow content package **Authorization For Expenditure** .

Note: In case the Approver Determination Strategy is selected as "External Service" in workflow configurations, then a CPI iFlow needs to be implemented with the below mentioned endpoint, input and output details.

API Attributes	Values
Path	/http/getApproversAFE
HTTP Method	GET



For more information for creation of root Document Management Service repository please follow the steps described in [Initial Setup for Document Management](#), [Integration Option](#) and [Connect to Document Management, Repository Option](#) Using API (incl. Prerequisites). Save generated Repository ID from the response.

Configure Document Management Service Destination

Configure a Document Management Service destination with the following parameters:

Name	bpmworkflowruntime_attachments
Type	HTTP
Proxy Type	Internet
Authentication	OAuth2UserTokenExchange
URL	<"endpoints":"ecmservice":"url">/browser/ <Repository_ID>/root/
Token Service URL	<"uaa":"url">/oauth/token
Token Service URL Type	Dedicated

Populate Client ID and Client Secret with the values from the Service Key created on the previous step (see [Create Service Keys Using the Cockpit](#)).

For more information refer to [Create HTTP Destinations](#) and [OAuth User Token Exchange Authentication](#). Make sure that the users which are going to use the application have "SDM_Admin" or "SDM_User" roles assigned to them.

Configure SAP Central Fiori Launchpad Site

Configure Fiori Launch Pad site to access Workflow Monitoring applications, My Inbox, Process Visibility Workspace and Start UI application to create approval requests. Please refer help documentation [how to configure a start ui tiles on Central Fiori Launchpad](#).

Deploy Custom UIs and Workflow module

The project consists of the following:

- AFE_Planner HTML5 module – serves as the Workflow Start User Interface application for creation of AFE requests
- AFE_WF_UserTask HTML5 module – serves as the Workflow Task User Interface application for processing AFE requests by Approver.

Configure AFE Planner Tile on Central Fiori Launchpad Site


- Open SAP Launchpad site manager application.
- Select Content Manager and Content Explorer
- Search **com.wf.afeplanner.afeplanner** and select SAP UI5 component.
- Click Add to My Content button to include the UI5 component.

My Content **Content Explorer**

Explore your content providers and add content items to your subaccount

HTML5 Apps

Items (1)

<input type="checkbox"/>	Title	Description	ID	
<input checked="" type="checkbox"/>	 AFE Planner	AFE Planner to submit project for Approval	com.wf.afeplanner.afeplanner	<input type="button" value="X Remove"/>

- Select My Content tab and Search Everyone.
- Click Everyone from the result and navigate to the details.
- Click Edit button to enable all users to access the new Start UI tile.
- Search for Document and select AFE Planner
- Click the + button and Save the changes.
- Click New button and Select Group to create a new group.
- Add a Title for eg: AFE Planner under PROPERTIES.
- Search Document and Select AFE Planner.
- Click + button and Save button.

Deploy Custom ABAP Objects

Steps to implement the custom ABAP objects required by this content package is mentioned in the below sections.

Creating CDS

Pre-requisite:

1. Eclipse must be installed along with ADT plugins.
2. Developer access and authorizations should be available in SAP S/4 HANA to create CDS views

Steps:

1. Open Eclipse in ABAP perspective
2. Go to Files -> New -> ABAP Project
3. Select the system in which you want to create the CDS view
4. Enter the system connection details and credentials
5. Right click on project and the go to New -> Other and select "Data Definition" (Name of CDS will be "ZWF_STANDARD_WBS")
6. Copy paste the code in code editor from [ZWF_STANDARD_WBS.txt](#) in SAP Note 3118538
7. Click on Save
8. Click on Activate

Similarly, copy paste the code in code editor from these files in SAP Note 3118538

[ZWF_STATISTICAL_WBS.txt](#)

[ZWF_PROJECTS.txt](#)

[ZWF_PROJECT_JV.txt](#)

[ZWF_PROJECT_STATUS.txt](#)

[ZWF_PROJECT_TYPE.txt](#)

Creating Function Group

Steps:

1. Go to t-code "SE37"
2. In Menu, select Goto -> Function Groups -> Create Group
3. Enter Function Group name as "ZWF_FG_AFE" and also enter a meaningful Short Text (Select the required package name to save this object)
4. Go to t-code "SE80"
5. Select "Function Group" from dropdown
6. Enter "ZWF_FG_AFE" as the name of function group and click on Display button
7. Right click on the Function Group "ZWF_FG_AFE " on the left side panel and "Click on "Activate" (Click OK button on the pop-up which shows list of inactive objects)

Creating Function Modules

Steps:

1. Go to t-code "SE37"
2. Click on "Create" button
3. Enter "ZWF_RFC_PS_SET_STATUS" as name of Function Module
4. Enter "ZWF_FG_AFE" as Function Group
5. Enter a meaningful short text
6. Click on "Save" (Click on OK in successive pop-ups)
7. Go to "Attributes" tab and select radio button for "Remote-Enabled Module"
8. Go to "Import" tab and enter the below mentioned entries

Import Parameters:

Parameter Name	Typing	Associated Type	Pass By Value
PROJECT_DEFINITION	TYPE	BAPIPR-PROJECT_DEFINITION	Yes
SET_USER_STATUS	TYPE	BAPI_USER_STATUS- USER_STATUS	Yes

9. Go to "Export" tab and create the below entries

Export Parameters:

Parameter Name	Typing	Associated Type	Pass By Value
POSTINGSTATUS	TYPE	CHAR1	Yes

10. Go to "Source Code" tab

11. Copy and paste the code in source code editor from the file [ZWF RFC PS SET STATUS.txt](#) in SAP Note 3118538

12. Click on "Save"

13. Click on "Activate" (Click OK button on the pop-up which shows list of inactive objects)

14. Go to t-code SE11

15. Select "Data Type" radio button

16. Enter "ZSTR_UPDATE_BUDGET" as name of "Data Type"

17. Select "Structure" and click on OK

18. Enter the below mentioned fields and description

Structure Name: ZSTR_UPDATE_BUDGET

Short Description: Update budget structure

Components:

Components	Typing Method	Component Type
TRANSACTIONCURRENCY	Types	CHAR100
PLANNINGCOST	Types	CHAR100
PARENTPROJECT	Types	CHAR100
PROJECTELEMENTDESCRIPTION	Types	CHAR100
PROJECTELEMENT	Types	CHAR100

19. Click on "Save"

20. Click on "Activate" (Click OK button on the pop-up which shows list of inactive objects)

Note: Perform the same steps (1 to 12) for Function Module

"ZWF RFC PS UPDATE_BUDGET" but with below mentioned entries for "Import" and

"Export" tabs. (Copy and paste the code in source code editor from the file

[ZWF RFC PS UPDATE BUDGET.txt](#) in SAP Note 3118538)

Import Parameters:

Parameter Name	Typing	Associated Type	Pass By Value
I_PROJECT_DEFINITION	TYPE	PROJ-PSPID	Yes

Tables Parameters:

Parameter Name	Typing	Associated Type	Pass By Value
I_WBSELEMENTS	TYPE	ZSTR_UPDATE_BUDGET	Yes
RETURN	TYPE	BAPIRET2	Yes

Creating OData

Steps:

1. Go to t-code "SEGW"
2. Click on "Create" to create new project
3. Enter Project as "ZWF_STD_WBS", Description as "OData to fetch Standard WBS" and select the required package
4. Expand the newly created project.

5. Right click on "Data Model" folder and then select "Reference" -> "Data Source"
6. Enter "ZWF_STANDARD_WBS" as CDS-Entity Name and click on Next
7. Click on Finish
8. Click on Save
9. Click on "Generate Runtime Objects" (red color circular) button on top left corner (Select the required Transport Request and Package)
10. Now go to "Runtime Artifacts" folder, right click on "ZCL_ZWF_STD_WBS_DPC_EXT" and select "Go to ABAP Workbench"
11. Go to Methods -> Inherited Methods and "Redefine" the method ZWF_STANDARD_WBS_GET_ENTITYSET" by right clicking on the method
12. Copy paste the code from the file [ZWF_STANDARD_WBS_GET_ENTITYSET.txt](#) of SAP Note 3118538 in source code editor
13. Click on Save
- 14.** Click on Activate

Register OData Services in SAP Gateway

Steps:

1. Go to t-code "/IWFND/MAINT_SERVICE"
2. Click on "Add Service"
3. Select the required System Alias
4. Enter Technical Service Name as "ZWF_STD_WBS_SRV" and click on "Get Services"
5. Select "ZWF_STD_WBS_SRV" and click on "Add Selected Services"
6. Enter the required package and click on OK
7. Repeat steps 1 to 6 for Technical Service "ZWF_PROJECTS_CDS"

Configure Status Profile

Steps:

1. Go to t-code "STVARV"
2. Go to "Parameter" tab
3. Maintain the below mentioned entry:
Name -> WF_AFE_PROFILE
Value -> <status profile created for AFE>
4. Click on Save