SAP Fiori Mobile (v2.1.x)

Introduction

What are hybrid mobile apps?

Hybrid mobile apps are web applications wrapped up their own browser which can run on any of the mobile platforms (Android, iOS, Windows etc.). The big advantage of a hybrid app is that it has a single code base, whereas a native app must be re-written for each platform.

Apache Cordova is an open-source framework for developing hybrid apps. To use native features (beyond those already available via hmtl5,) apps can make use of plugins. These plugins handle the platform-specific code and are available for single or multiple platforms. Plugins are available to access the GPS, accelerometer or camera, for example.

SAP have written their own plugins, branded as Kapsel, to handle things like logon and offline OData. These bring an enterprise flavour to hybrid apps.

What is Fiori Mobile?

Until recently SAP's recommended approach was to use the Hybrid Application Toolkit (or HAT) in order to build hybrid apps. The app build took place on the developer's PC or Mac. The HAT gained a reputation for being tricky to set up and that hindered the use of hybrid apps within the SAP ecosystem.

Fiori Mobile has at its core a cloud-build service, so there is no need to install the HAT. We can trigger the build from Web IDE. We specify the (already deployed) Fiori app(s) that we want to package and after a few minutes we can download the .apk (for Android) and .ipa (for iOS) files ready to be installed on mobile devices.

Does it work?

The cloud build service works well. It typically build for both platforms in about 8 minutes without issueas. There have only been a couple of occasions when builds failed due to technical problems.

There are some facets to the technology which don't feel mature yet. One area is the offline OData features. When using Fiori Mobile things work differently to the more conventional hybrid and native apps. One example would be the destinations, because Fiori Mobile apps use a generated destination which reference the SAP Cloud Platform (CP) portal service.

My point is not that offline OData seems immature, rather that the offline features can be tricky when used with Fiori Mobile apps. We are still receiving assistance from SAP to get the offline features of our app optimised. This is a shame, because shared data and the handling of delta requests, for example, are two features which justify the 'middleware' approach to offline that SAP have taken.

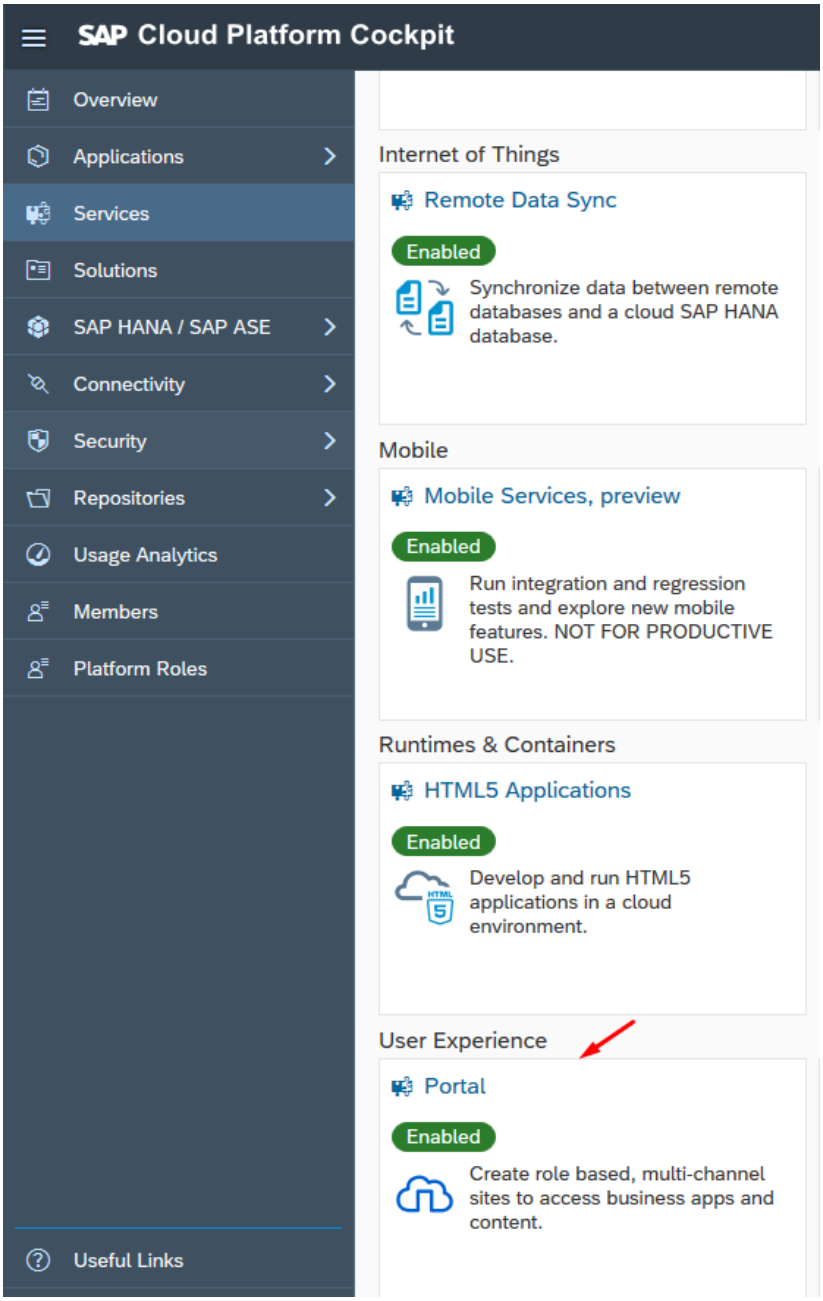
Authentication has also been a challenge. On a previous project I used the Fiori Client in conjunction with SAP Cloud Identity (now officially SAP Cloud Platform Identity Authentication). The Fiori Client stored the username and password on the device so that the user didn't need to enter them every time their session timed out. We haven't achieved that yet with our Fiori Mobile app.

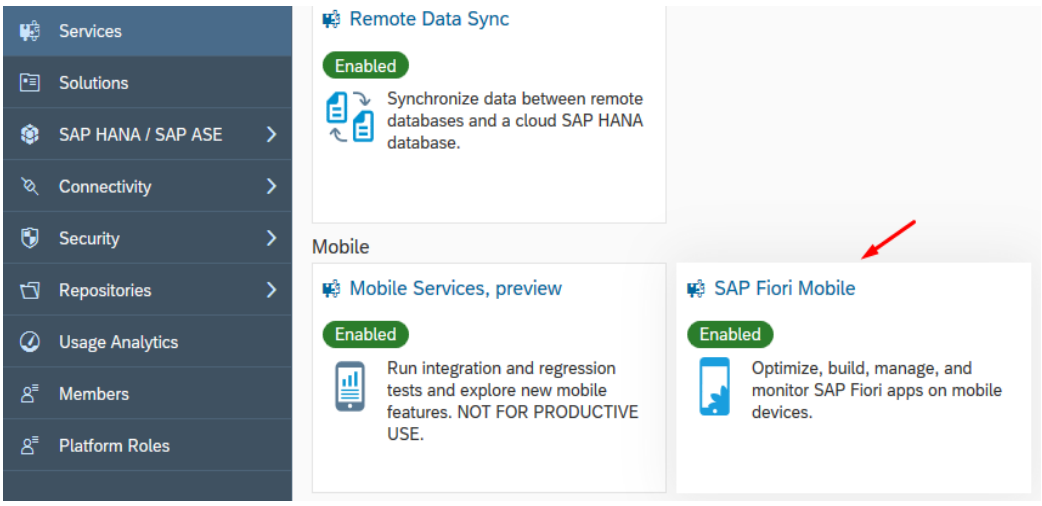
Account and Services

If you have production account browse on HCP Cockpit and log in. If you use trial account log in here

As we said before there is two ways to build SAP Fiori mobile application:

1. Using **Fiori Mobile Service.** Note that this service have been discontinued from March 31, 2018. Strategic features available in the mobile service for SAP Fiori have been incorporated into SAP Cloud Platform mobile service for development and operations. However you can use this service if you have old account that already has enabled that service. Using this service require two other services to be enabled: **Portal Service** and **SAP Web IDE Full-Stack Service**.


SAP Cloud Platform Cockpit
Overview
Applications
Services
Solutions
SAP HANA / SAP ASE
Connectivity
Security
Repositories
Usage Analytics
Members
Platform Roles
Useful Links
Internet of Things
Remote Data Sync
Enabled
Synchronize data between remote databases and a cloud SAP HANA database.
Mobile
Mobile Services, preview
Enabled
Run integration and regression tests and explore new mobile features. NOT FOR PRODUCTIVE USE.
Runtimes & Containers
HTML5 Applications
Enabled
Develop and run HTML5 applications in a cloud environment.
User Experience
Portal
Enabled
Create role based, multi-channel sites to access business apps and content.


Services
Solutions
SAP HANA / SAP ASE
Connectivity
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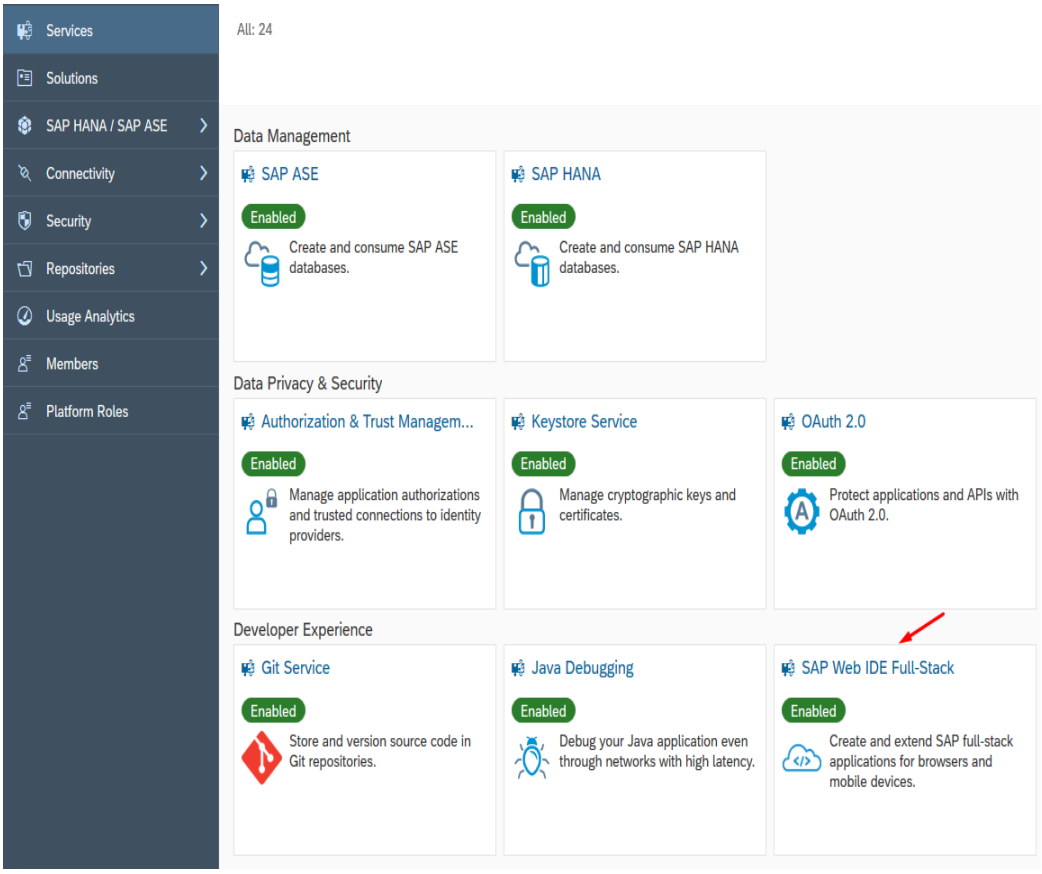
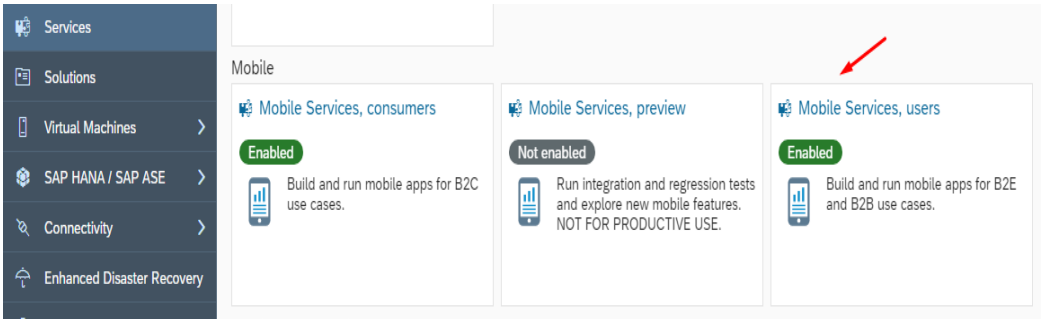
Mobile
Mobile Services, preview
Enabled
Run integration and regression tests and explore new mobile features. NOT FOR PRODUCTIVE USE.
SAP Fiori Mobile
Enabled
Optimize, build, manage, and monitor SAP Fiori apps on mobile devices.



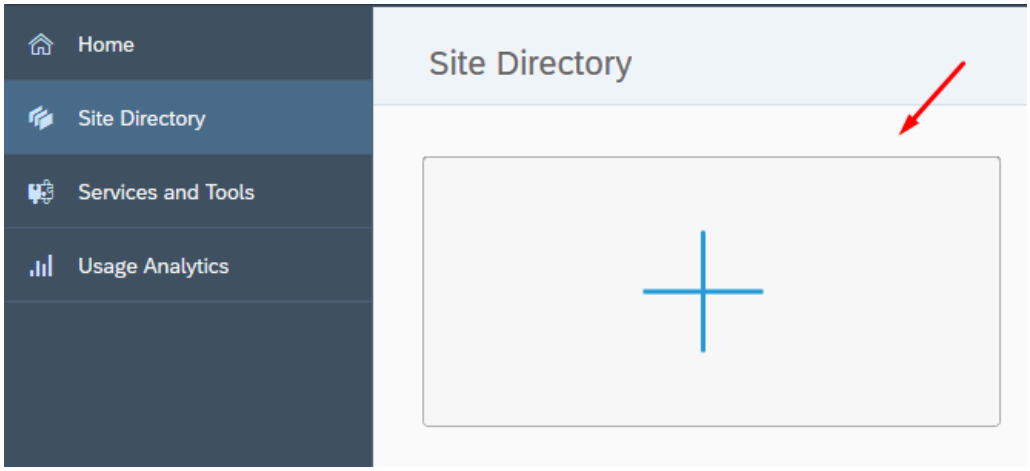
2. Using **HAT** (Hybrid Application Toolkit) extension in **SAP Web IDE Full-Stack Service.** Using this extension require **Mobile Services** to be enabled.



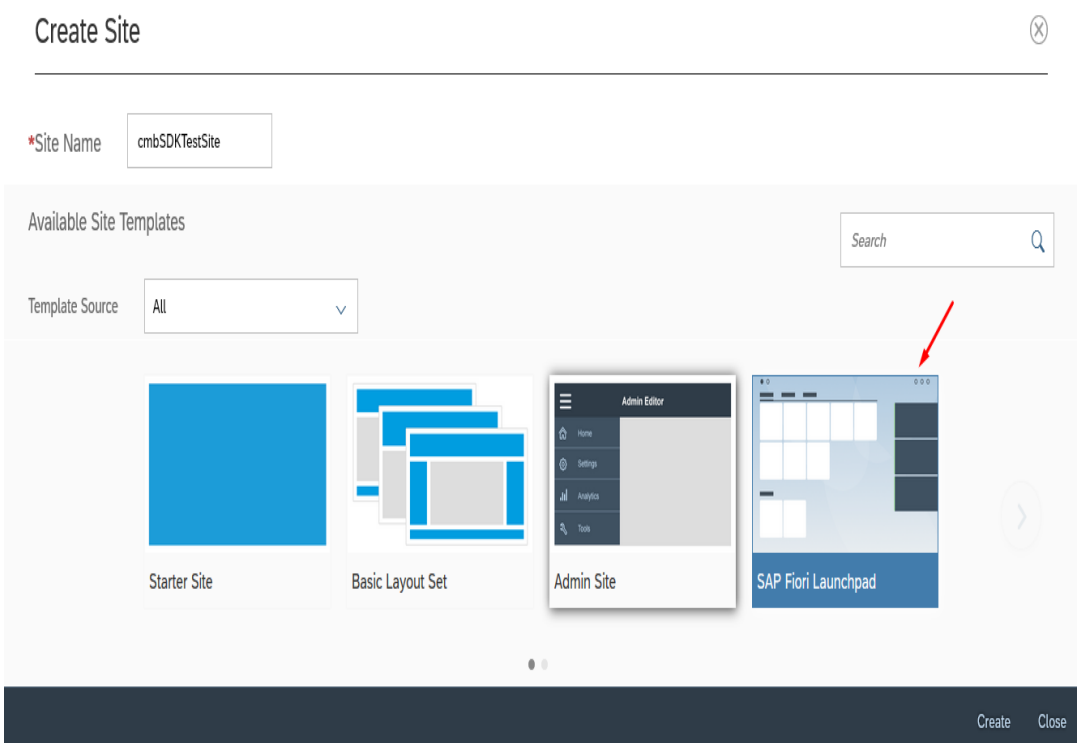
Create Fiori Launchpad

If we use SAP Fori Mobile Service to build mobile application first we need to create and publish site where application will be deployed. Otherwise if we use HAT skip this step and continue with Create Fiori Project

Go to **Portal Service** and create new Site Directory

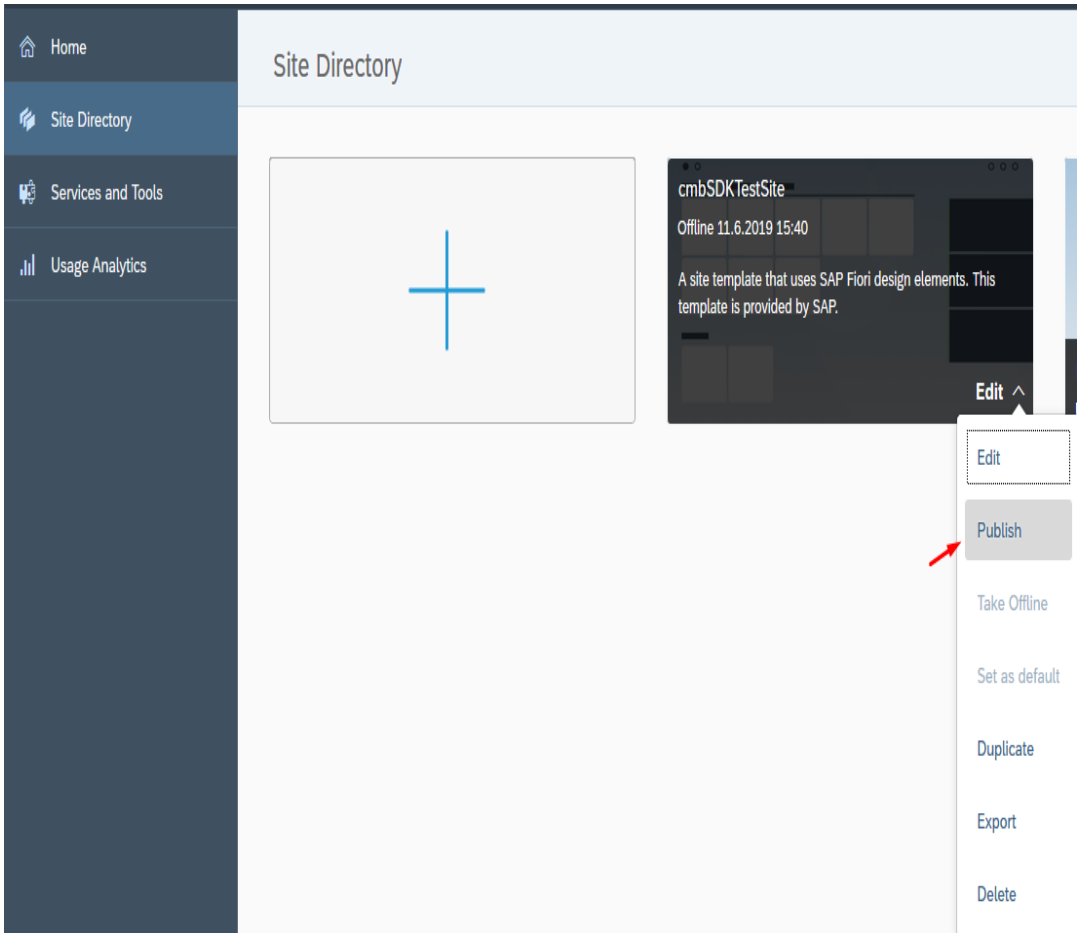


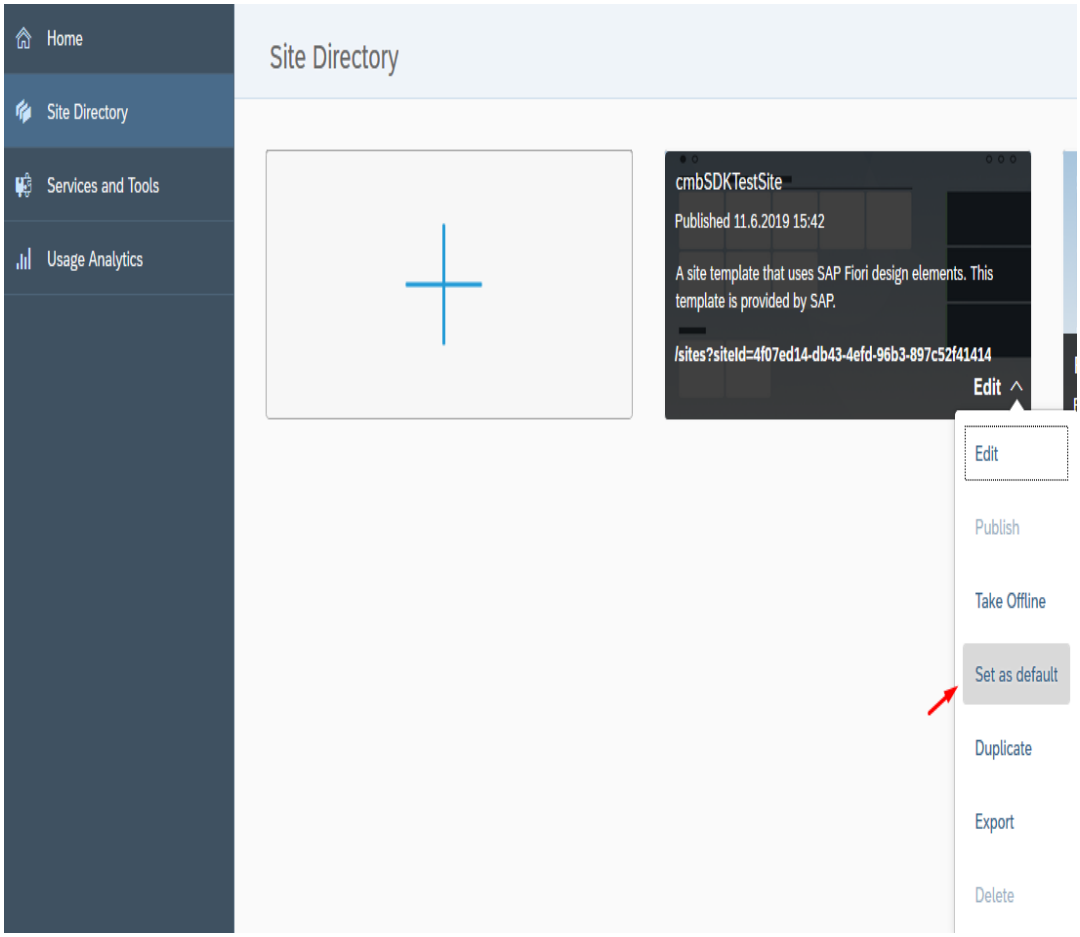
A popup will be displayed. Enter your **Site Name**, choose **SAP Fiori Launchpad** as Template Source and click Create



Following this you will be redirected to SAP Fiori Configuration Cockpit. Close the tab and go back to Admin Space for Portal Service.

Now we need to Publish this Site and Set as default.

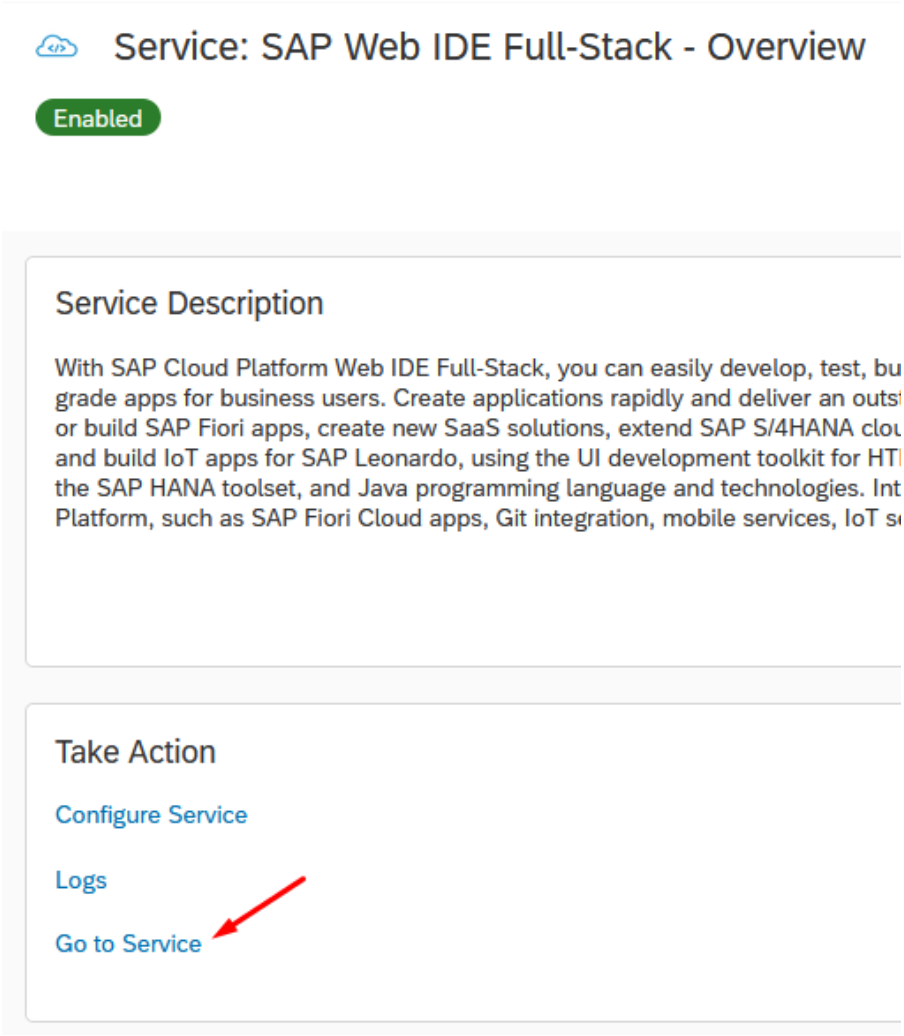

Home
Site Directory
Services and Tools
Usage Analytics
Site Directory
cmbSDKTestSite
Offline 11.6.2019 15:40
A site template that uses SAP Fiori design elements. This template is provided by SAP.
Edit
Edit
Publish
Take Offline
Set as default
Duplicate
Export
Delete



Create Fiori Project

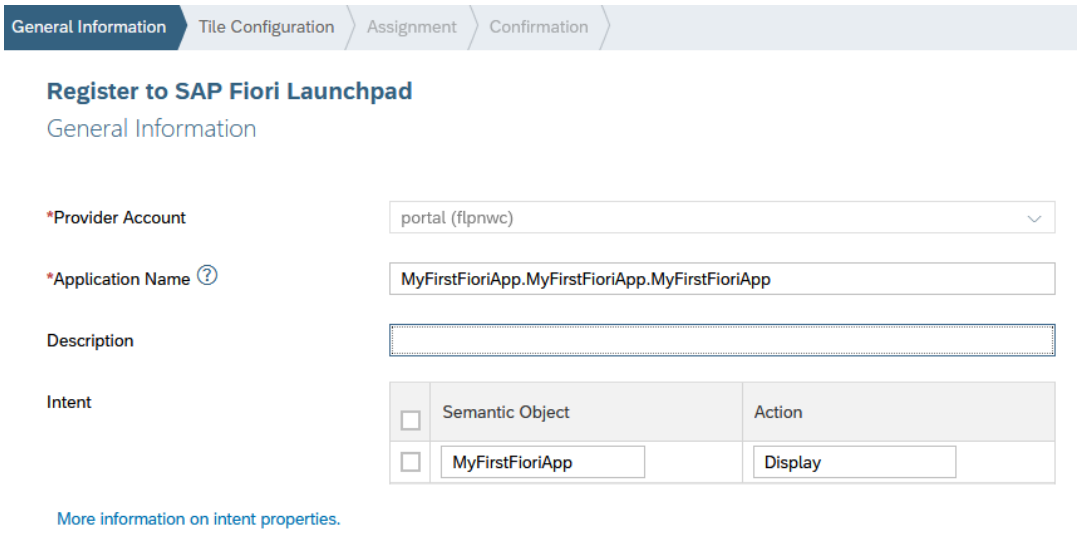
Once we create and publish cmbSDKTestSite we can create our Fiori project (if we use Fiori Mobile Service to build mobile application, otherwise if we use HAT we don't need to publish site on Launchpad and creating Fiori project will be our first step).

Go to Services tab again, open SAP Web IDE Full-Stack service, and click on Go to Service

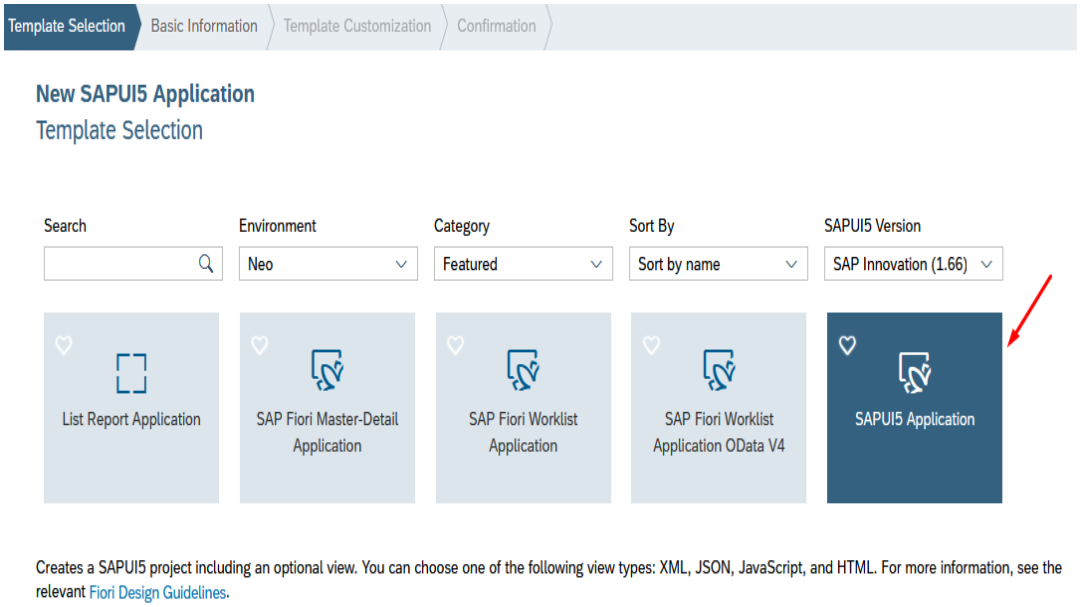


A new tab will be opened. From here we will start to create our Fiori project.

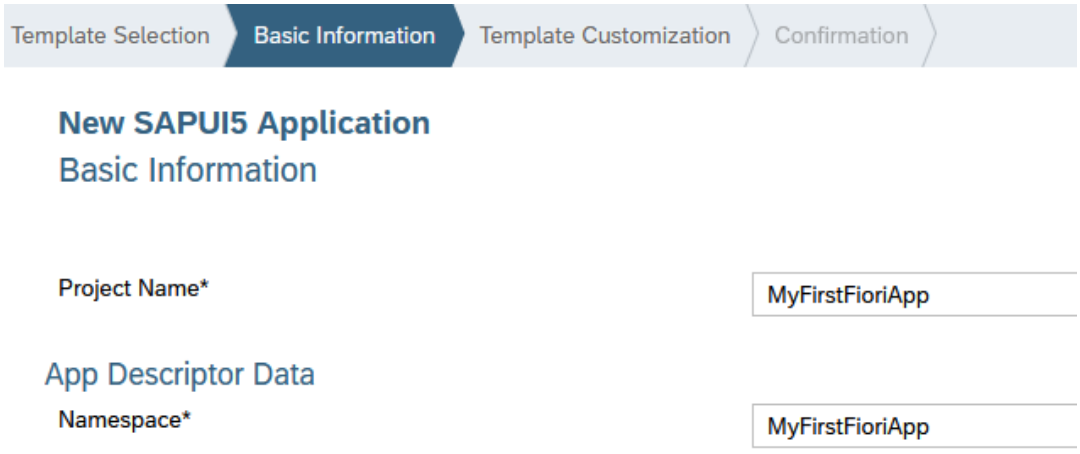
- Click on New Project from Template



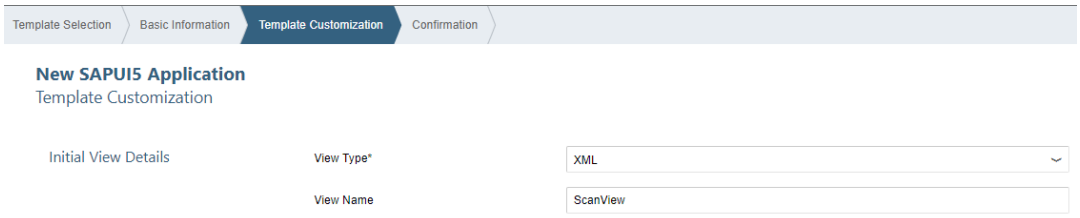
- Choose SAPUI5 Application from Template Selection



- Set your Project Name and Namespace

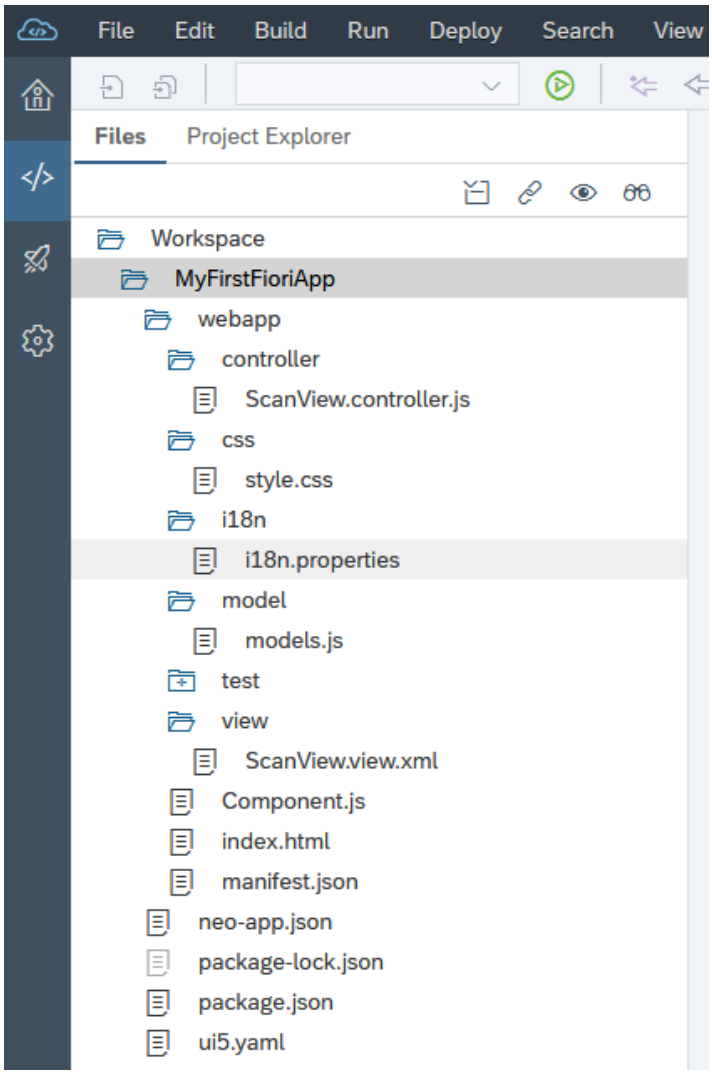


- Choose the View Type and set the View Name. In our sample we will use XML View. Click Finish and your Fiori project is created.



How to use cmbSDK cordova plugin

In the SAP Web IDE Workspace we can see all files that our Fiori project inludes.



Open *Component.js* file.

Component.js is the first point of our application, we can say that it serves as index which encapsulates all our applications details, i.e. view names, routing details, main view, applications type(Full Screen or SplitApp), application service configuration etc..

Here in **init** function we will configure our plugin. Set properties that we need, set callback functions, call some methods, etc..

```
sap.ui.define([
        "sap/ui/core/UIComponent",
        "sap/ui/Device",
        "MyFirstFioriApp/MyFirstFioriApp/model/models"
], function (UIComponent, Device, models) {
        "use strict";

        var oEventBus = sap.ui.getCore().getEventBus();
        var scannerIsInitialized = false;

        return UIComponent.extend("MyFirstFioriApp.MyFirstFioriApp.Component", {

                metadata: {
                        manifest: "json"
                },
```

```
		/**
		 * The component is initialized by UI5 automatically during the startup of the app and calls the init metho
		 * @public
		 * @override
		 */
		init: function () {
			// call the base component's init function
			UIComponent.prototype.init.apply(this, arguments);

			// enable routing
			this.getRouter().initialize();

			// set the device model
			this.setModel(models.createDeviceModel(), "device");

			if (!scannerIsInitialized) {

				scannerIsInitialized = true;
				window.readerConnected = 0;
				window.scannerActive = false;

				cmbScanner.addOnResume(function (result) {
					cmbScanner.setAvailabilityCallback((readerAvailability) => {
						if (readerAvailability === cmbScanner.CONSTANTS.AVAILABILITY_AVAILABLE) {
							oEventBus.publish("ScanView", "SetConnectionStatus", {
								statusText: "AVAILABLE"
							});
							cmbScanner.connect((result) => {});
						} else {
							oEventBus.publish("ScanView", "SetConnectionStatus", {
								statusText: "NOT AVAILABLE"
							});
						}
					});
					if (Device.os.android) {
						cmbScanner.connect((result) => {});
					}
				});

				cmbScanner.addOnPause(function (result) {
					if (Device.os.android) {
						cmbScanner.disconnect();
					}
					cmbScanner.setAvailabilityCallback();
				});

				cmbScanner.setPreviewContainerPositionAndSize(0, 0, 100, 50);

				cmbScanner.setConnectionStateDidChangeOfReaderCallback((connectionState) => {
					if (connectionState === cmbScanner.CONSTANTS.CONNECTION_STATE_CONNECTED) {
						oEventBus.publish("ScanView", "SetConnectionStatus", {
							statusText: "CONNECTED"
						});
						if (window.readerConnected != connectionState) {
							cmbScanner.setSymbologyEnabled("SYMBOL.DATAMATRIX", true);
							cmbScanner.setSymbologyEnabled("SYMBOL.C128", true);
							cmbScanner.sendCommand("SET TRIGGER.TYPE 2");
						}
					} else if (connectionState == cmbScanner.CONSTANTS.CONNECTION_STATE_DISCONNECTED) {
						oEventBus.publish("ScanView", "SetConnectionStatus", {
							statusText: "DISCONNECTED"
						});
					} else if (connectionState == cmbScanner.CONSTANTS.CONNECTION_STATE_CONNECTING) {
						oEventBus.publish("ScanView", "SetConnectionStatus", {
							statusText: "CONNECTING"
						});
					} else if (connectionState == cmbScanner.CONSTANTS.CONNECTION_STATE_DISCONNECTING)
						oEventBus.publish("ScanView", "SetConnectionStatus", {
							statusText: "DISCONNECTING"
						});
					}
					window.readerConnected = connectionState;
				});

				cmbScanner.setAvailabilityCallback((readerAvailability) => {
					if (readerAvailability === cmbScanner.CONSTANTS.AVAILABILITY_AVAILABLE) {
						oEventBus.publish("ScanView", "SetConnectionStatus", {
							statusText: "AVAILABLE"
```

```
                                        });
                                        cmbScanner.connect((result) => {});
                                } else {
                                        oEventBus.publish("ScanView", "SetConnectionStatus", {
                                                statusText: "NOT AVAILABLE"
                                        });
                                }
                        });

                        cmbScanner.setActiveStartScanningCallback((result) => {
                                if (result === true)
                                        window.scannerActive = true;
                                else
                                        window.scannerActive = false;
                        });

                        cmbScanner.setPreviewOptions(cmbScanner.CONSTANTS.PREVIEW_OPTIONS.DEFAULTS | cmbScanner.CON

                        cmbScanner.setCameraMode(cmbScanner.CONSTANTS.CAMERA_MODES.NO_AIMER);

                        var sdkKEY = "";
                        if (Device.os.android)
                                sdkKEY = this.getModel("i18n").getProperty("MX_MOBILE_LICENSE_ANDROID");
                        else
                                sdkKEY = this.getModel("i18n").getProperty("MX_MOBILE_LICENSE_iOS");

                        cmbScanner.registerSDK(sdkKEY);

                        cmbScanner.loadScanner(0, (result) => {
                                cmbScanner.connect((result) => {});
                        });

                        oEventBus.subscribe("Component", "LoadScanner", this.loadScanner, this);
                }
        },
        loadScanner: function (sChanel, sEvent, oData) {
                cmbScanner.disconnect((result) => {
                        cmbScanner.loadScanner(oData.selectedDevice, (result) => {
                                cmbScanner.connect((result) => {});
                        });
                });
        },
        onExit: function () {
                oEventBus.unsubscribe("Component", "LoadScanner", this.loadScanner, this);
                cmbScanner.disconnect();
                cmbScanner.setAvailabilityCallback();
        }
    });
});
```

cmbScanner is an object that represents our plugin. With this object we can access all API methods and Constants from our plugin.

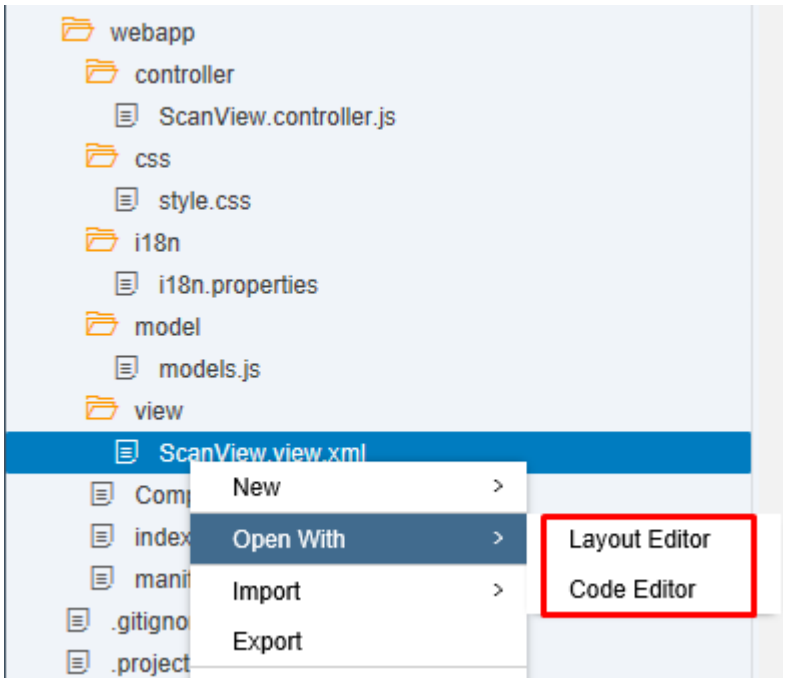
- **scannerIsInitialized** - variable to make sure that we set some functions for initialization only one time
- **window.readerConnected** - global variable that is changed every time when the reader connection state is changed
- **window.scannerActive** - global variable that shows us if scanning is active or not
- **cmbScanner.addOnPause** - in this method we disconnection from reader device on Android (on iOS this is handled automatically), and stop listening to availability changing
- **cmbScanner.addOnResume** - in this method we try to connect with reader device again and set callback for availability changing
- **cmbScanner.setPreviewContainerPositionAndSize** - to set the size and position of the preview container. Learn more here.
- **cmbScanner.setConnectionStateDidChangeOfReaderCallback** - all **connect/disconnect** events should be handled within the callback function set with this API method. If connection state is **connected** we set some reader device settings with API methods or directly with sendCommand() method. Here in this example we enable symbologies and set trigger type. Also here we should Licensing the SDK. We will speak about this later in this section
- **cmbScanner.setAvailabilityCallback** - to monitor for availability of the MX device. If MX device is available we try to connect. Learn more here.
- **cmbScanner.setActiveStartScanningCallback** - to monitor the state of the scanner. Learn more here.
- **cmbScanner.loadScanner** - to get a scanner up and running. Learn more here.

Here we are only configuring reader device, handling connections, availability, etc.. We will do scanning and getting results in other views. If we want to notify users about every connection state changed or other info about reader device we will be using EventBus sap object. With this object we can publish function and call them from any view in the application. In this example on connection state changed with EventBus we are calling **SetConnectionStatus** function that is implemented in view where scanning is performed and set label text to show user current connection state.

Now open **ScanView.view.xml** and add this code:

```
<mvc:View controllerName="MyFirstFioriApp.MyFirstFioriApp.controller.ScanView" xmlns:mvc="sap.ui.core.mvc" displayBlock="tr
	xmlns:core="sap.ui.core">
	<Shell id="shell">
		<App id="app">
			<pages>
				<Page id="page" title="{i18n>title}">
					<subHeader>
						<Toolbar id="__toolbar2" width="100%">
							<content>
								<FlexBox id="__box0" width="100%" alignContent="Center" ali
									<items>
										<Select id="selectActiveDevice" items="{/De
											<core:Item text="{text}" key="{key}
										</Select>
									</items>
								</FlexBox>
								<Label id="lblStatus" text="DISCONNECTED" width="100%" text
							</content>
						</Toolbar>
					</subHeader>
					<content>
						<FlexBox id="flexBoxContainer" width="100%" alignContent="Start" alignItems
					</content>
					<footer>
						<Toolbar id="__toolbar1" width="100%">
							<content>
								<Button id="btnScan" press="btnScanPress" text="Scan" width
							</content>
						</Toolbar>
					</footer>
				</Page>
			</pages>
		</App>
	</Shell>
</mvc:View>
```

You can design view with CodeEditor or with LayoutEditor.



After that open **ScanView.controller.js** and add this code

```
sap.ui.define([
	"sap/ui/core/mvc/Controller"
], function (Controller) {
	"use strict";

	var oEventBus = sap.ui.getCore().getEventBus();
	var oModel = new sap.ui.model.json.JSONModel();
	oModel.setData({
		Devices: [{
			key: "0",
			text: "MX Device"
		}, {
			key: "1",
			text: "Mobile Camera"
		}]
	});

	return Controller.extend("MyFirstFioriApp.MyFirstFioriApp.controller.ScanView", {
		onInit: function () {
			this.getView().setModel(oModel);
		},

		onAfterRendering: function () {
			window.scannerActive = false;
			switch (window.readerConnected) {
			case cmbScanner.CONSTANTS.CONNECTION_STATE_CONNECTED:
				this.getView().byId("lblStatus").setText("CONNECTED");
				break;
			case cmbScanner.CONSTANTS.CONNECTION_STATE_DISCONNECTED:
				this.getView().byId("lblStatus").setText("DISCONNECTED");
				break;
			case cmbScanner.CONSTANTS.CONNECTION_STATE_CONNECTING:
				this.getView().byId("lblStatus").setText("CONNECTING");
				break;
			case cmbScanner.CONSTANTS.CONNECTION_STATE_DISCONNECTING:
				this.getView().byId("lblStatus").setText("DISCONNECTING");
				break
			default:
				this.getView().byId("lblStatus").setText("UNKNOWN");
				break;
			}
			oEventBus.subscribe("ScanView", "SetConnectionStatus", this.setConnectionStatus, this);

			cmbScanner.setResultCallback((result) => {

				if(result && result.readResults && result.readResults.length > 0){

		 result.readResults.forEach((item, index) => {

		    if (item.goodRead == true) {
                                    //Perform some action on barcode read
                                    //example:
		      var verticalLayoutContainer = new sap.ui.layout.VerticalLayout(null, {
                                            width: "100%"
                                    }).addStyleClass("sapUiSmallMarginTop");
                                    verticalLayoutContainer.addContent(new sap.m.Label({
                                            text: item.symbologyString + ":",
                                            textAlign: "Begin",
                                            design: "Bold"
                                    }).addStyleClass("sapUiSmallMarginBegin"));
                                    verticalLayoutContainer.addContent(new sap.m.Text({
                                            text: item.readString,
                                            textAlign: "Begin"
                                    }).addStyleClass("sapUiSmallMarginBegin"));
                                    this.getView().byId("flexBoxContainer").addItem(verticalLayoutContainer);

		    }
		    else{
                                    //Perform some action when no barcode is read or just leave it empty
		    }
		 });
		}
			});
		},

		btnScanPress: function () {
			if (window.readerConnected === cmbScanner.CONSTANTS.CONNECTION_STATE_CONNECTED) {
```

```
                                if (window.scannerActive === true) {
                                        cmbScanner.stopScanning();
                                } else {
                                        cmbScanner.startScanning();
                                }
                        }
                },

                setConnectionStatus: function (sChanel, sEvent, oData) {
                        this.getView().byId("lblStatus").setText(oData.statusText);
                },

                activeDeviceChanged: function () {

                        cmbScanner.disconnect((result) => {
                                oEventBus.publish("Component", "LoadScanner", {
                                        selectedDevice: parseInt(this.getView().byId("selectActiveDevice").getSelectedKey()
                                });
                        });
                },

                onExit: function () {
                        oEventBus.unsubscribe("ScanView", "SetConnectionStatus", this.setConnectionStatus, this);
                        if (window.readerConnected === cmbScanner.CONSTANTS.CONNECTION_STATE_CONNECTED) {
                                if (window.scannerActive === true) {
                                        cmbScanner.stopScanning();
                                }
                        }
                        cmbScanner.setResultCallback((result) => {
                                return false;
                        });
                }
        });
});
```

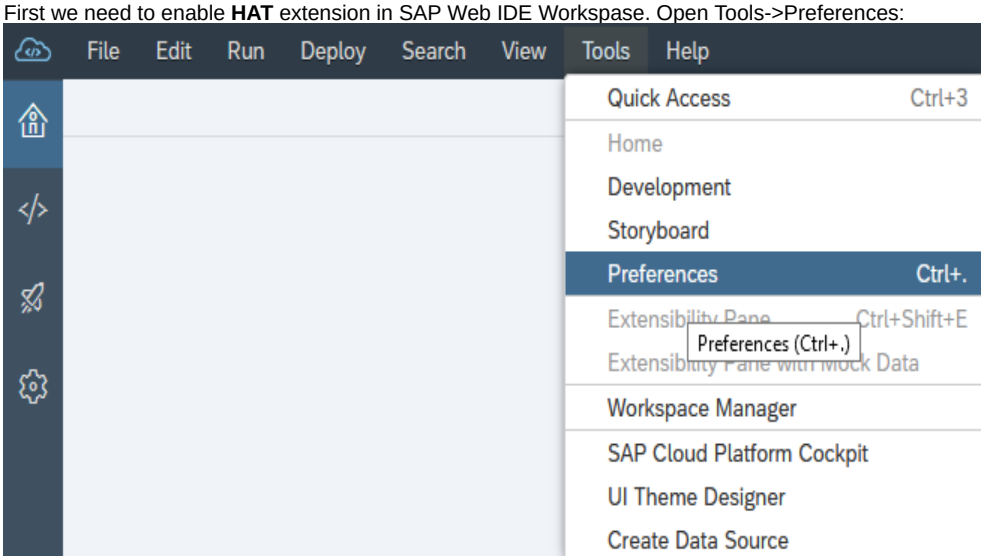
In this view we have a Scan button to startScanning()/stopScanning() and cmbScanner.setResultCallback to handle successful scan results.

Build Fiori Mobile Application

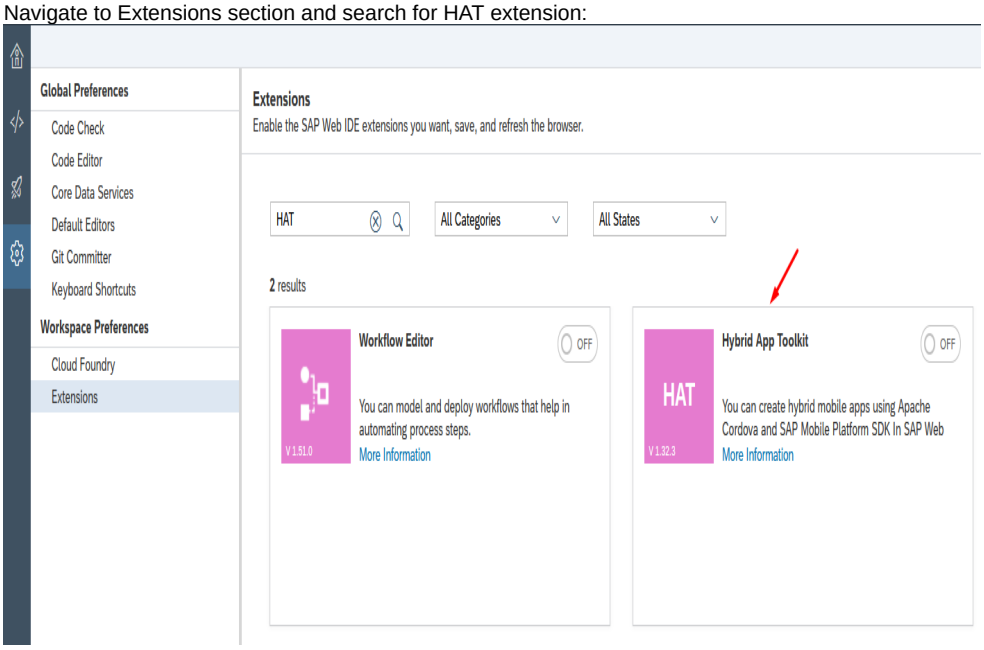
In this section we will explain how to build Fiori Mobile Application (generate .ipa and .apk files).

1. Using **HAT** (Hybrid Application Toolkit)

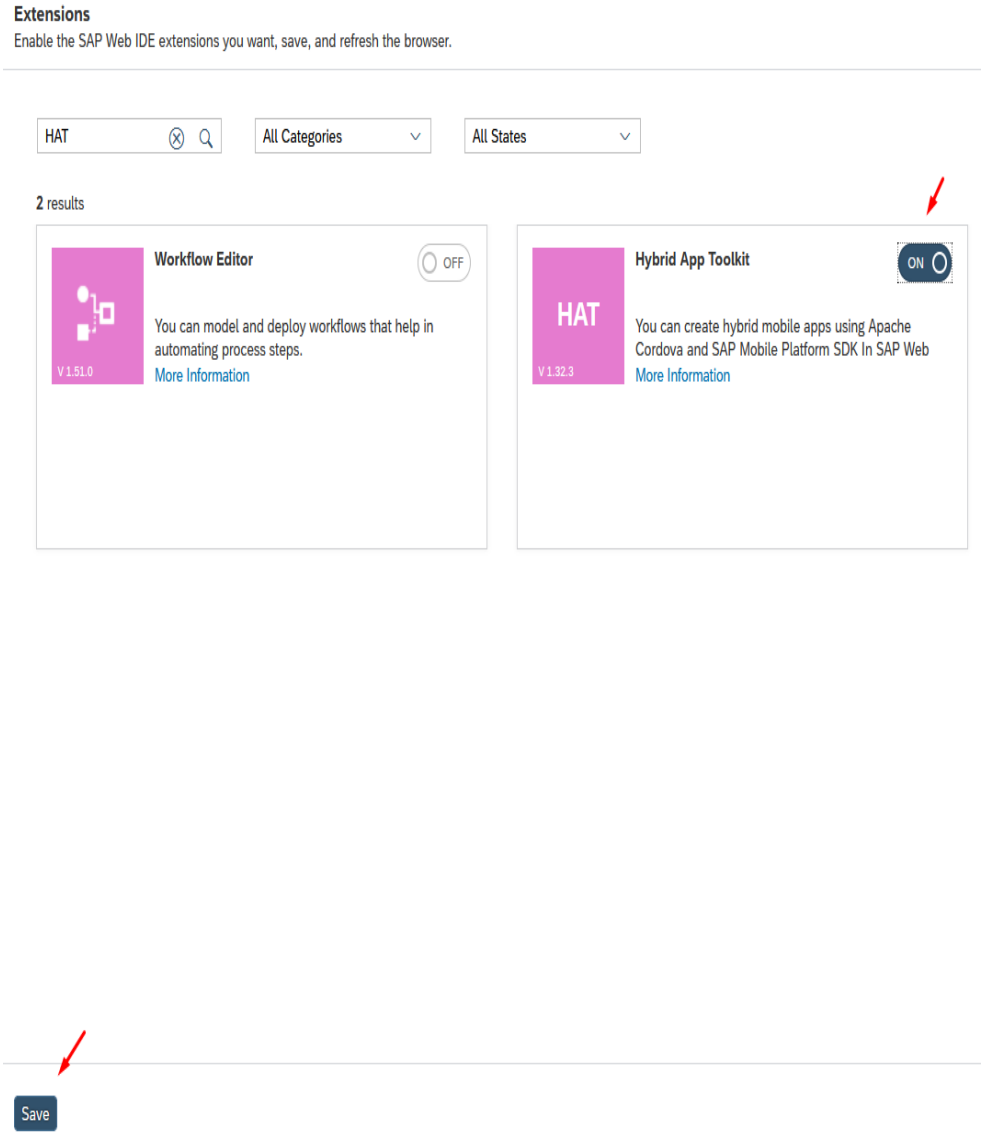
- First we need to enable **HAT** extension in SAP Web IDE Workspase. Open Tools->Preferences:



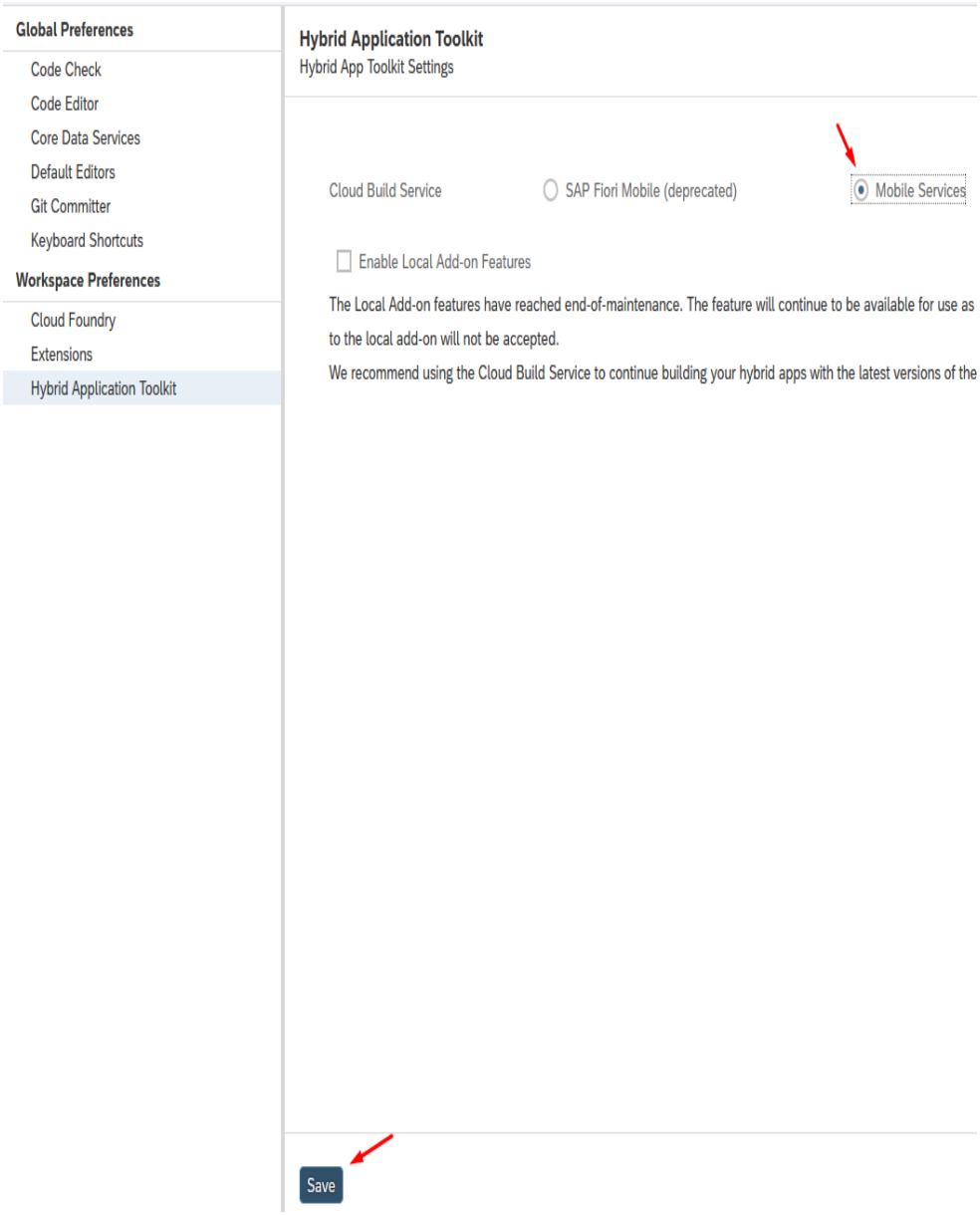
- Navigate to Extensions section and search for HAT extension:



By default HAT extension is disabled. Enable HAT extension and click Save. After enabling we will need to refresh SAP Web IDE.

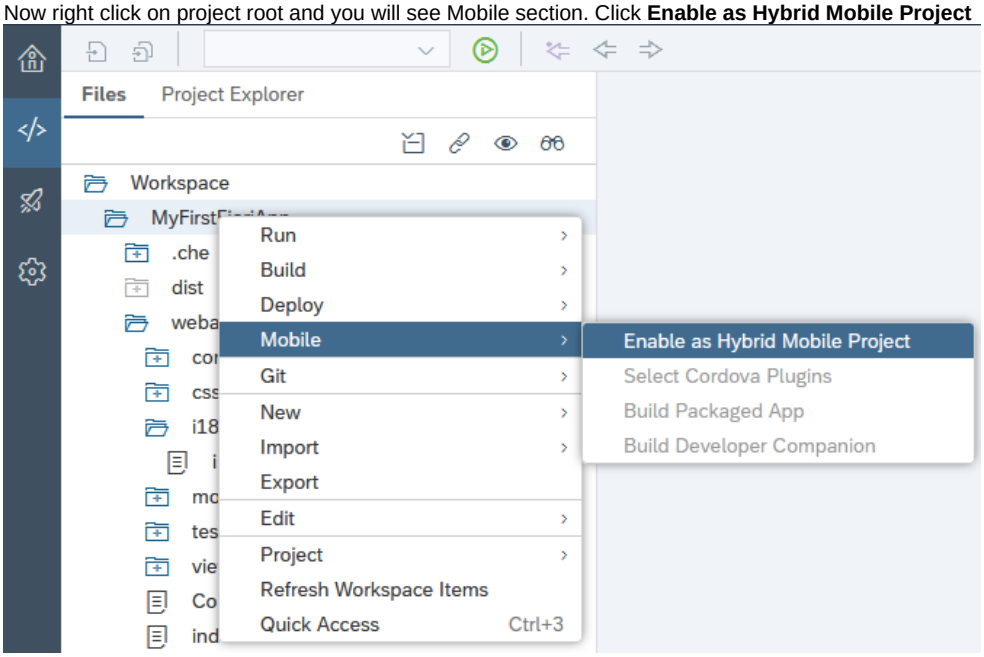


- After enabling HAT go again in Tools->Preferences. If you have both Fiori Mobile and Mobile Services enabled you will have options to select one that will be used as Cloud Build Service. Please choose **Mobile Services** and click Save:

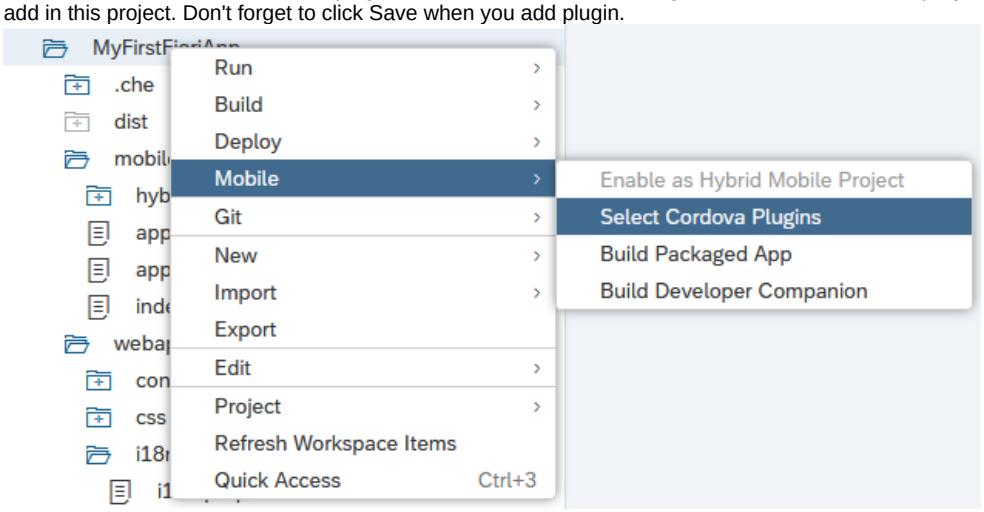


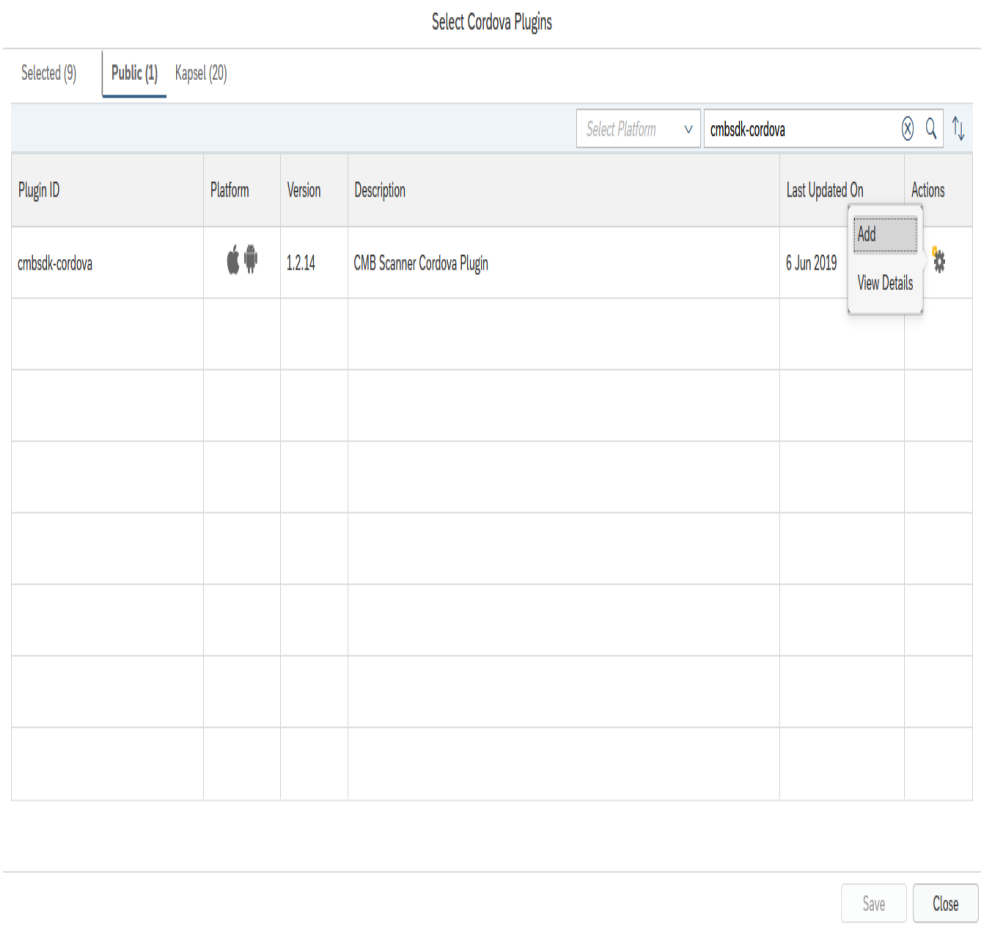
If you don't see these radio buttons you don't need to do anything. **Mobile Service** will be enabled by default.

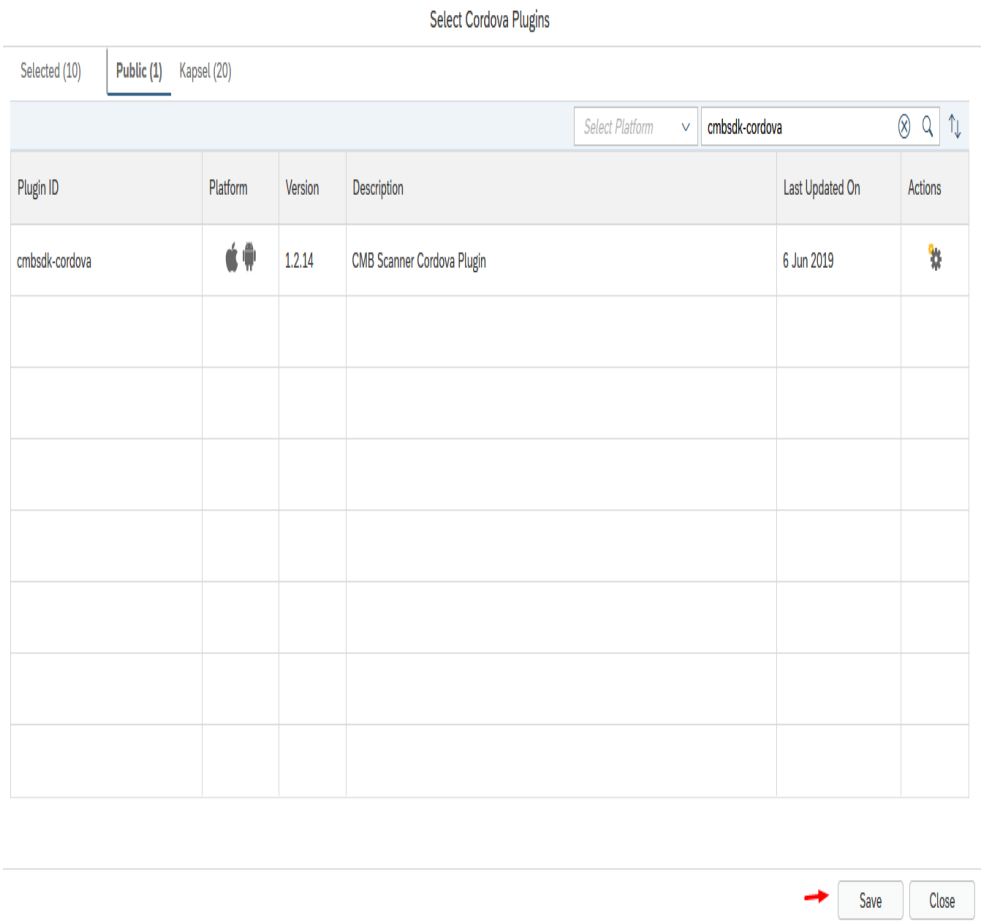
- Now right click on project root and you will see Mobile section. Click **Enable as Hybrid Mobile Project**



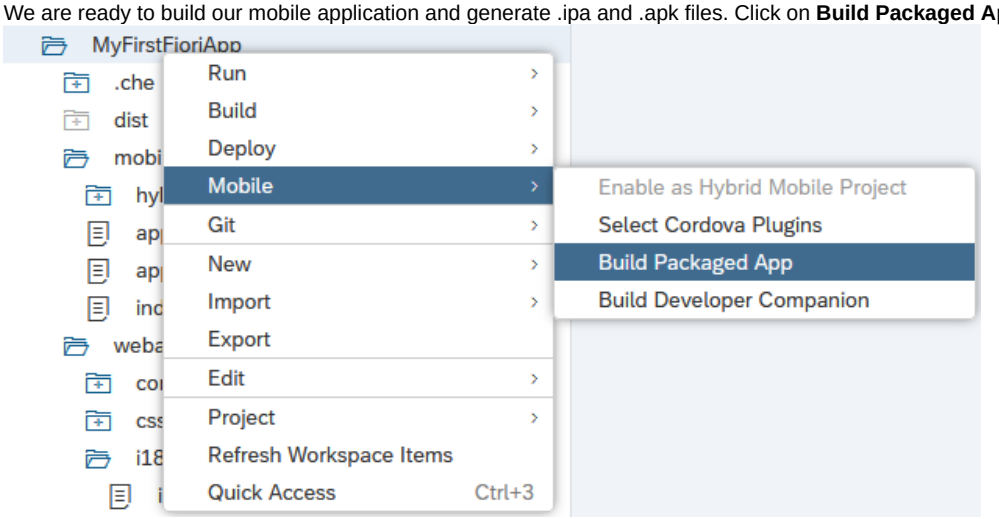
- You can see that some new files are added in our project that allow us to build this project as mobile application. Before build we need to add our **cmbsdk-cordova** plugin. Click on Select Cordova Plugins, find cmbsdk-cordova plugin from public plugins and add in this project. Don't forget to click Save when you add plugin.




Select Cordova Plugins
Selected (9)
Public (1)
Kapsel (20)
Select Platform
cmbsdk-cordova
Plugin ID
Platform
Version
Description
Last Updated On
Actions
cmbsdk-cordova
1.2.14
CMB Scanner Cordova Plugin
6 Jun 2019
Add
View Details
Save
Close

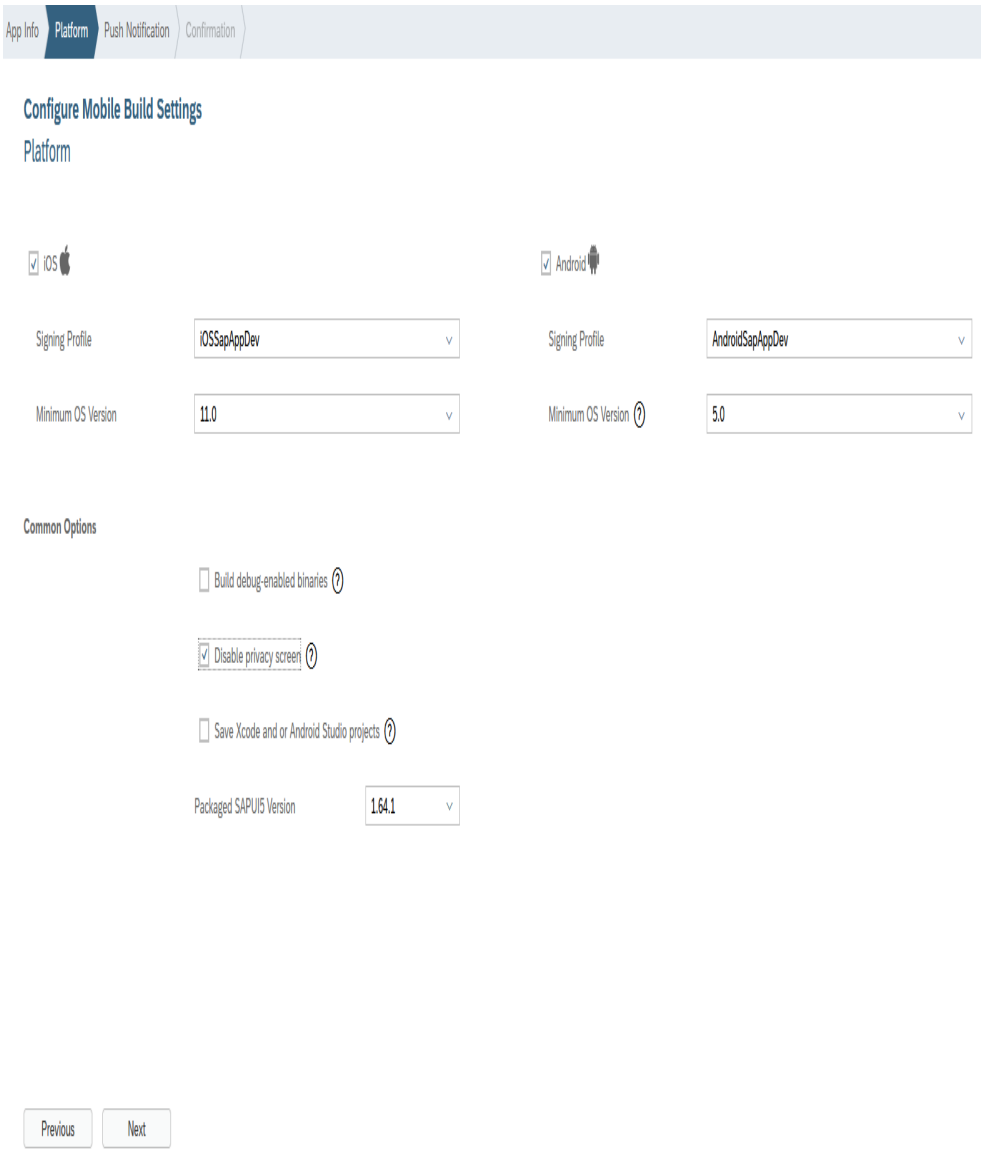

Select Cordova Plugins
Selected (10)
Public (1)
Kapsel (20)
Select Platform
cmbsdk-cordova
Plugin ID
Platform
Version
Description
Last Updated On
Actions
cmbsdk-cordova
1.2.14
CMB Scanner Cordova Plugin
6 Jun 2019
Save
Close

- We are ready to build our mobile application and generate .ipa and .apk files. Click on **Build Packaged App** from Mobile menu.

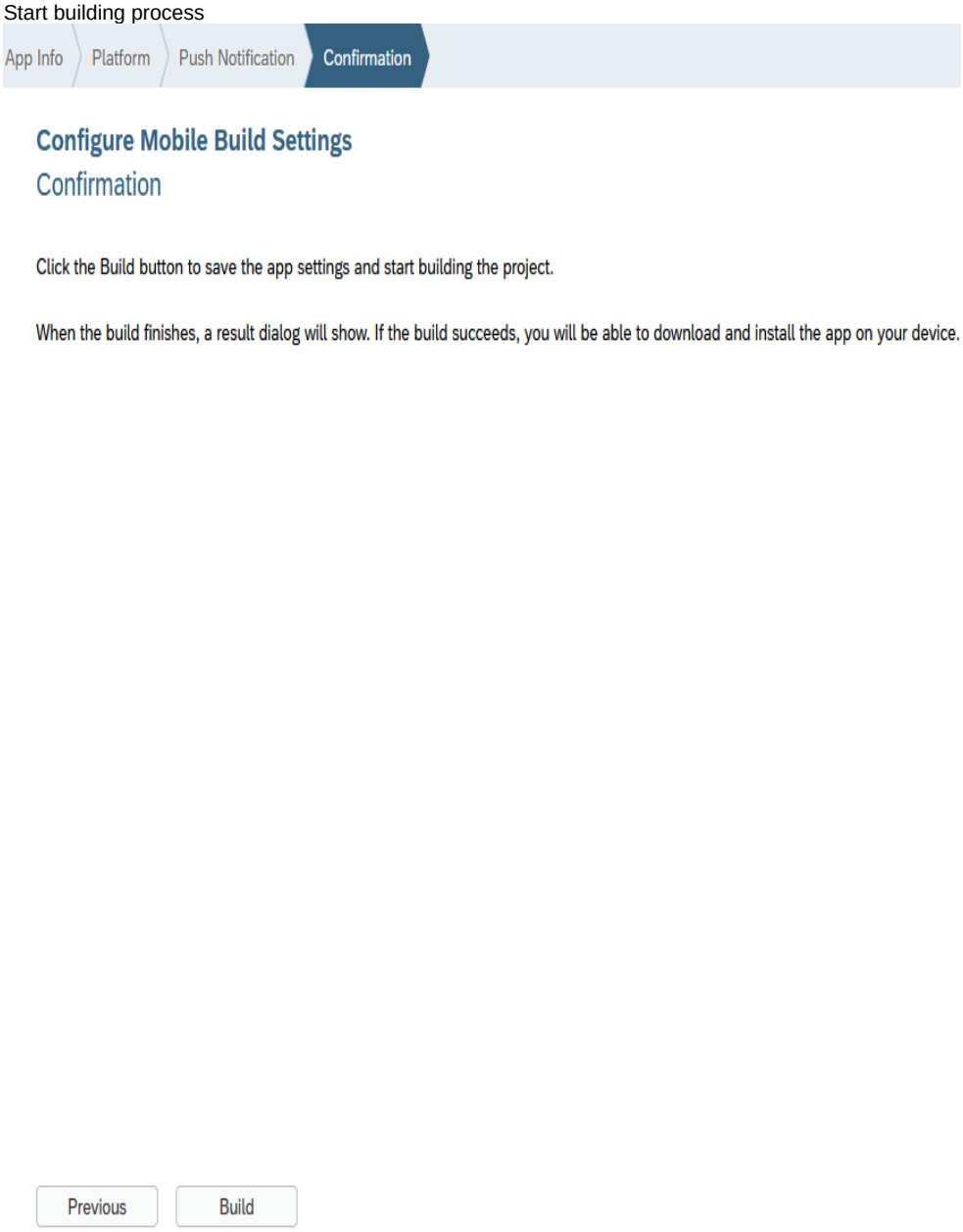


- Set your application details

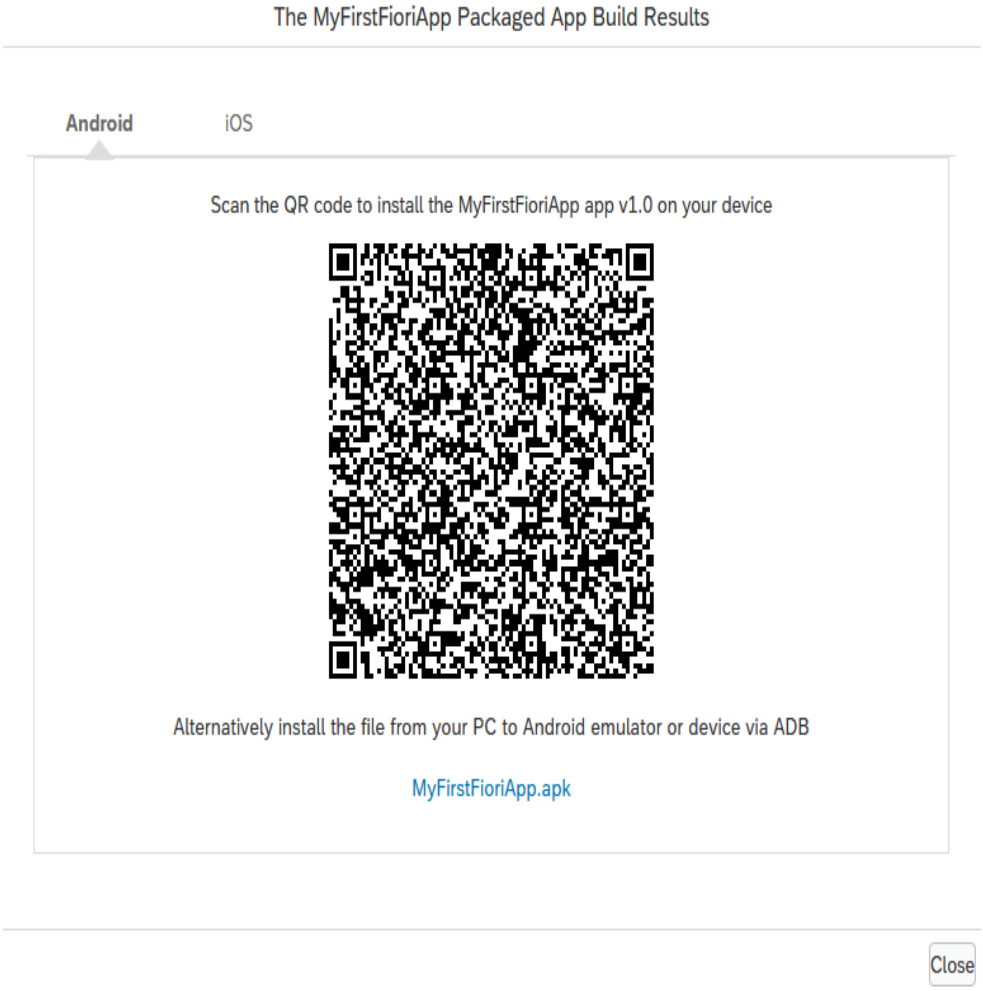
- Choose platform or both iOS and Android platforms, select signing profiles (or create one if you don't have) and set some common options


App Info
Platform
Push Notification
Confirmation
Configure Mobile Build Settings
Platform
iOS
Signing Profile
iOSSapAppDev
Minimum OS Version
11.0
Android
Signing Profile
AndroidSapAppDev
Minimum OS Version
5.0
Common Options
Build debug-enabled binaries
Disable privacy screen
Save Xcode and or Android Studio projects
Packaged SAPUI5 Version
1.64.1
Previous
Next

- Start building process



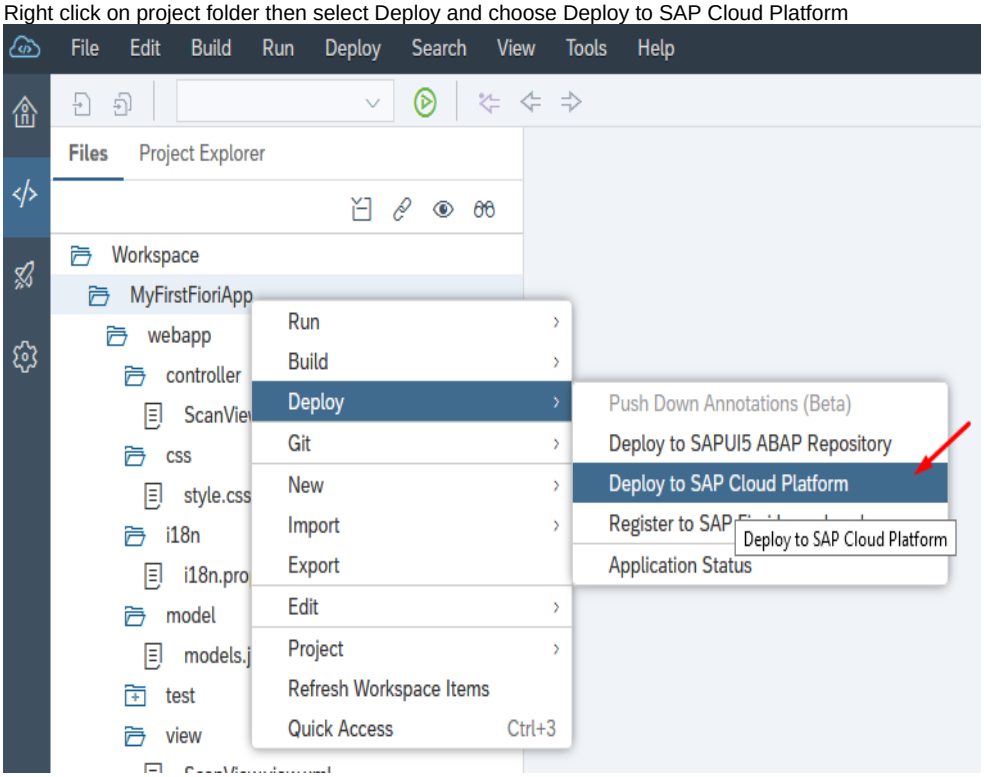
- When building process is finished popup from where you can download .ipa and .apk files will be shown



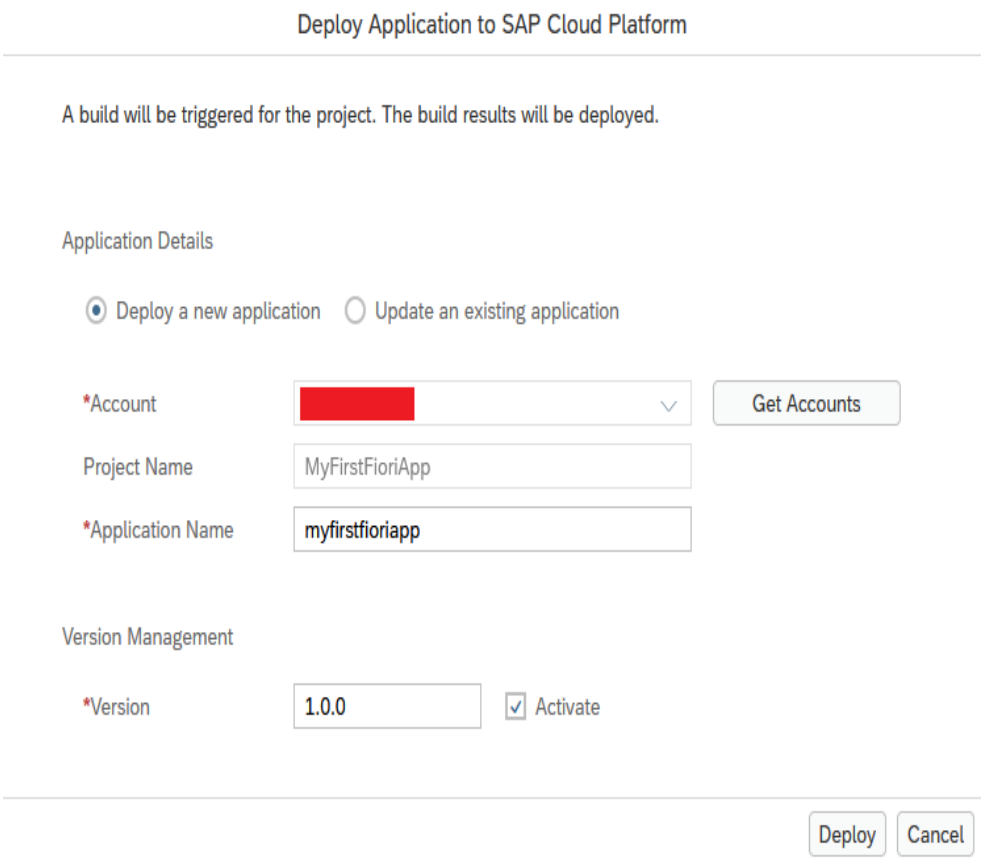
2. Using **Fiori Mobile Service**

Before we start to build our Fiori Mobile Application with Fiori Mobile Service we need to deploy our project on SAP HANA Cloud Platform.

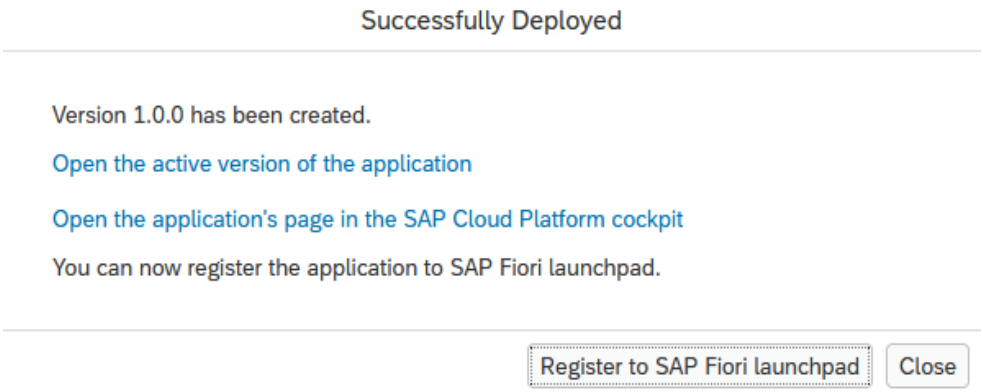
- Right click on project folder then select Deploy and choose Deploy to SAP Cloud Platform



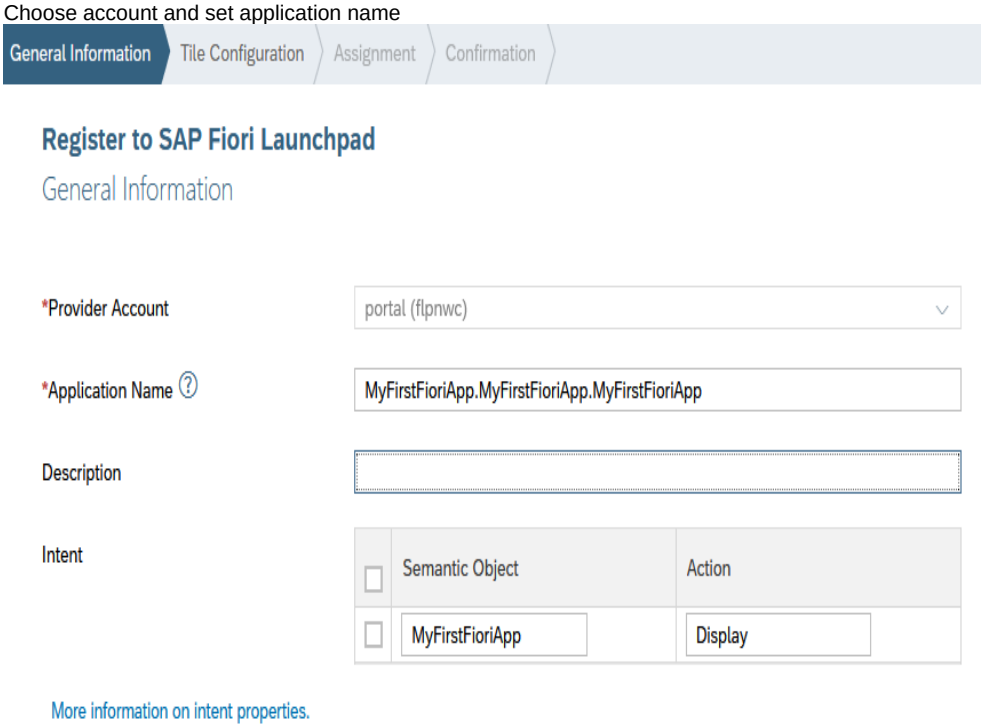
- Set application details and click Deploy



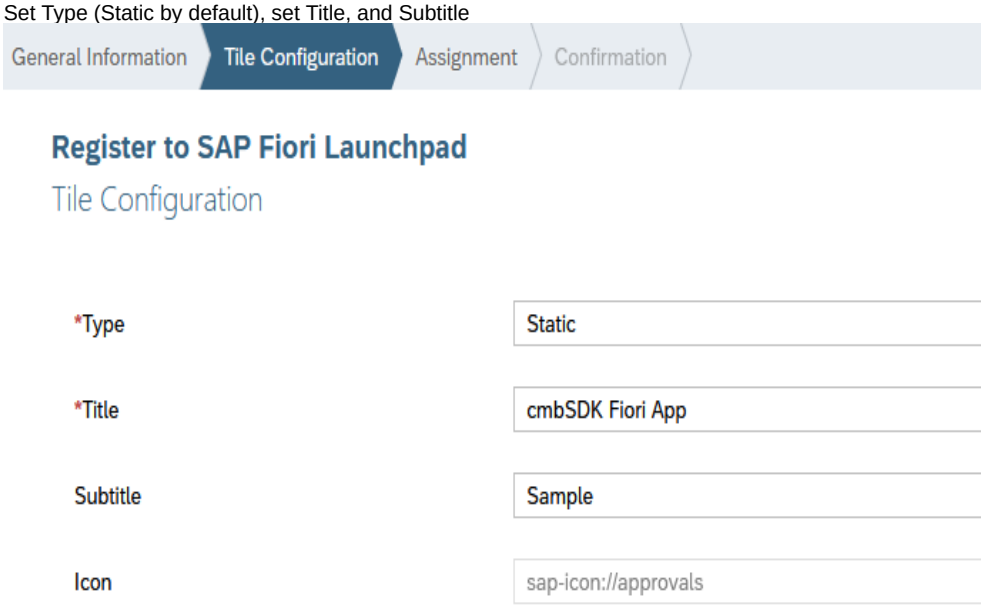
- After a successful deploy, the next step is to Register to SAP Fiori launchpad that we've created in the previous section.



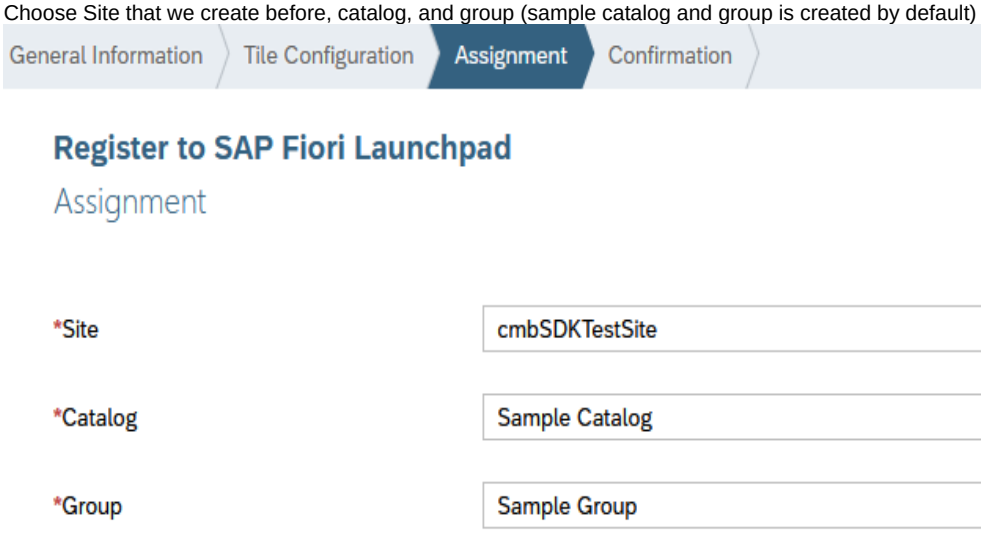
- Choose account and set application name



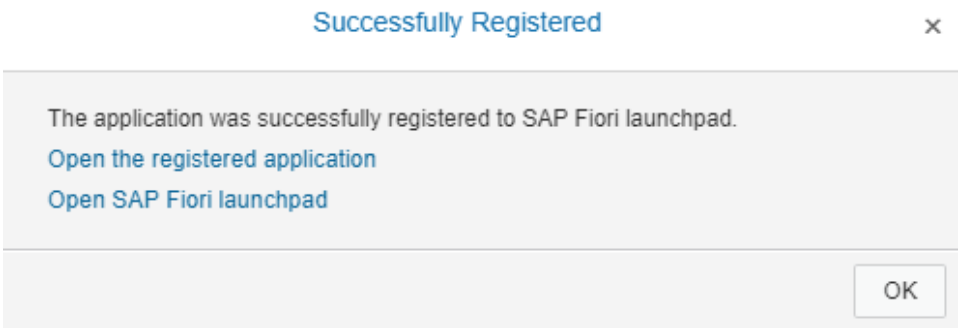
- Set Type (Static by default), set Title, and Subtitle



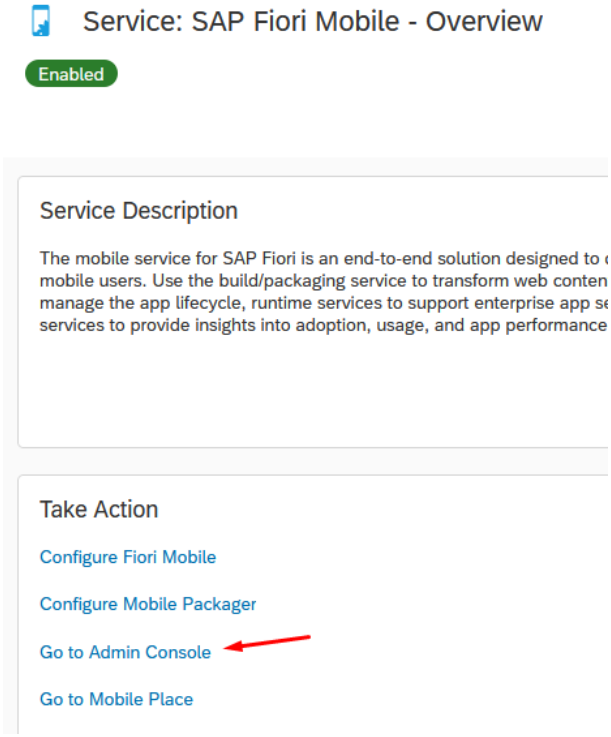
- Choose Site that we create before, catalog, and group (sample catalog and group is created by default)



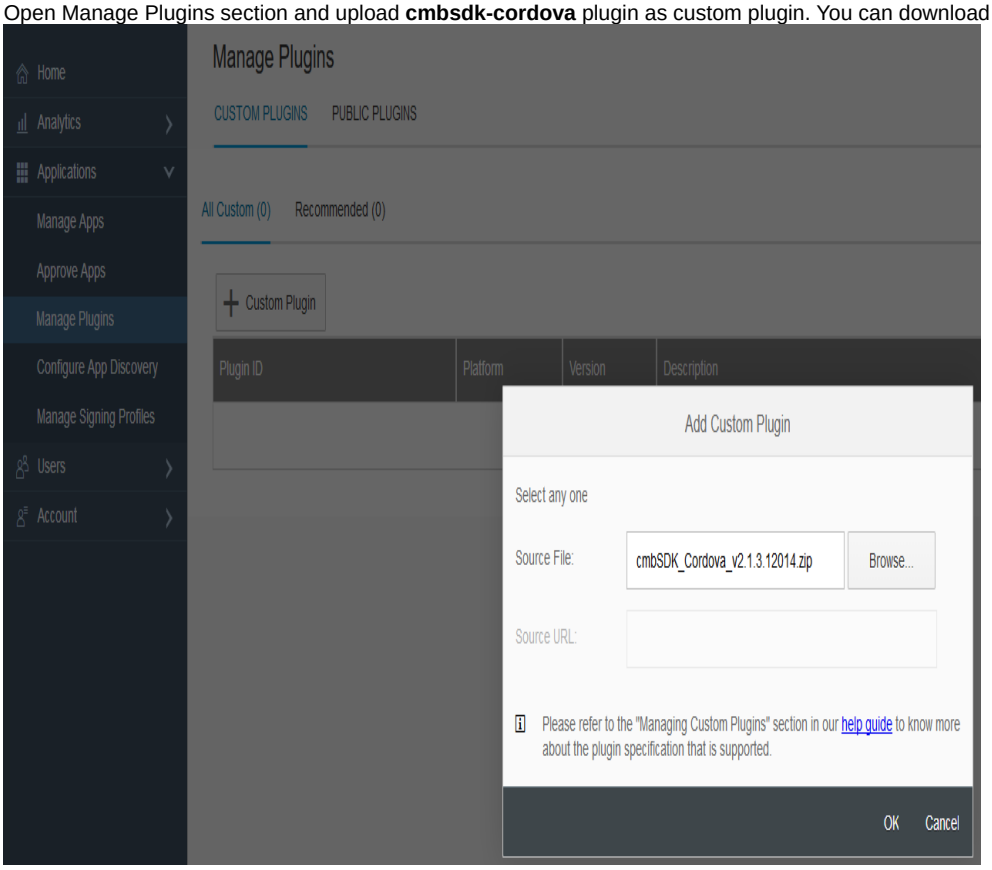
- Click finish on Confirmation tab and if everything is fine the popup below will be shown. Click OK to close this popup. With these steps we deploy our project on HCP and now we can continue to build our Fiori Mobile Application



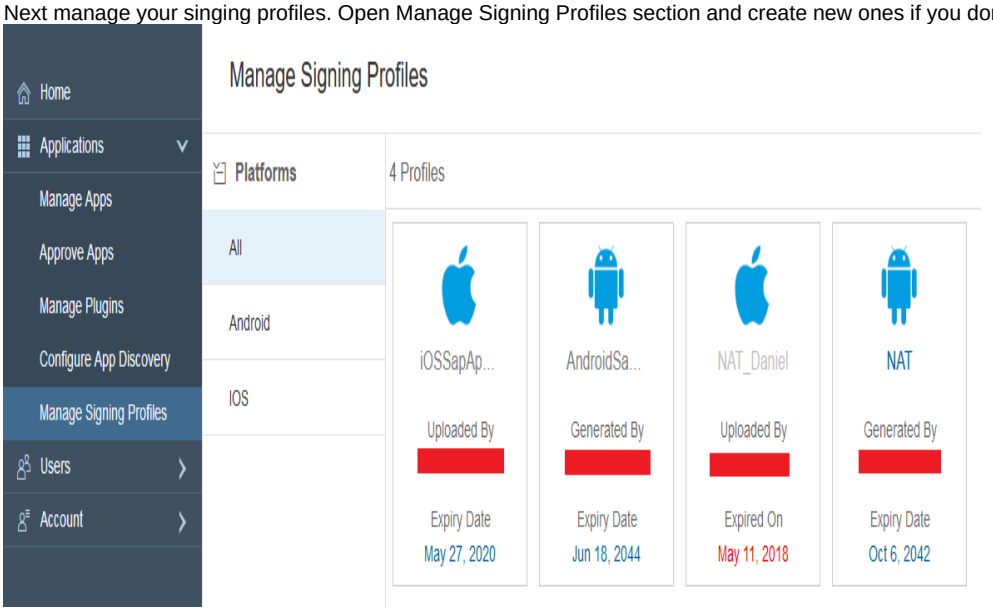
- Go to Services tab again, open Fiori Mobile service, and click on Go to Admin Console



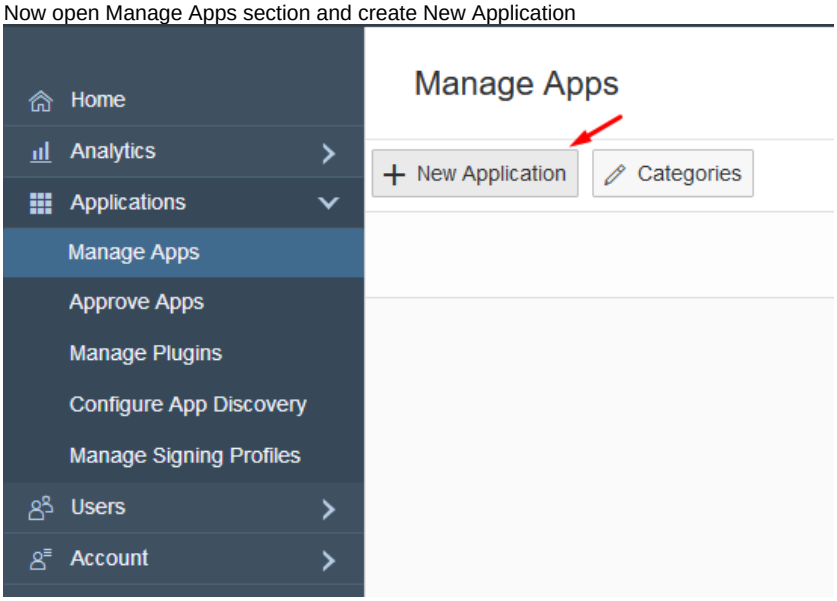
- Open Manage Plugins section and upload **cmbsdk-cordova** plugin as custom plugin. You can download latest plugin on this link.



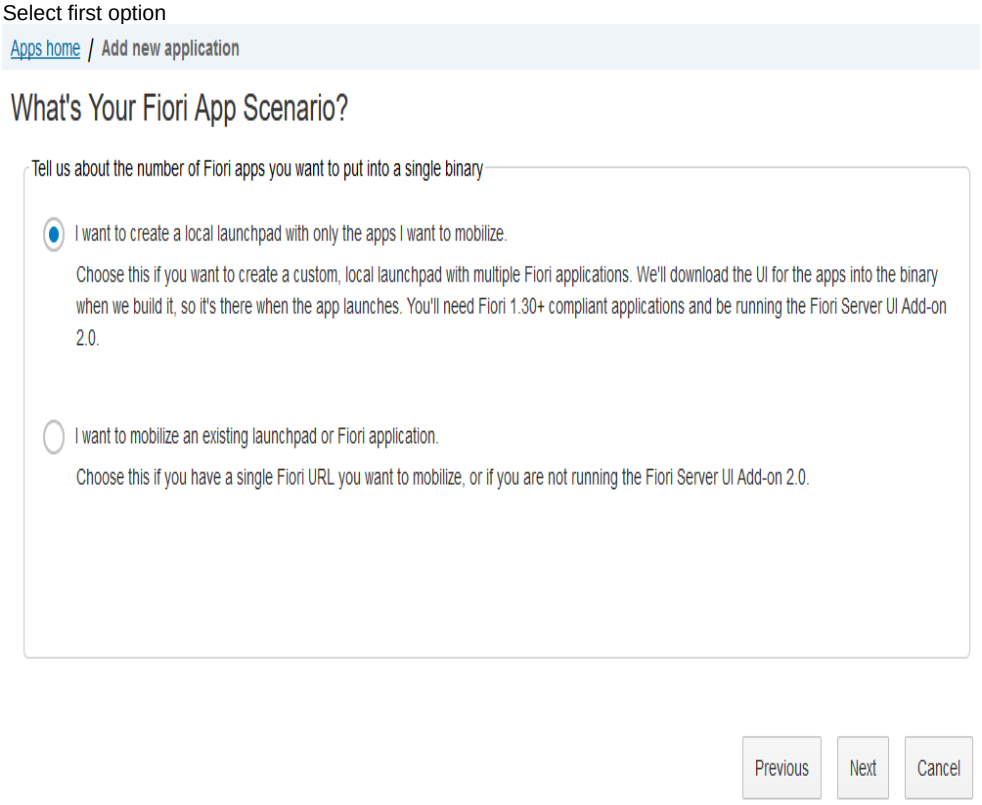
- Next manage your singing profiles. Open Manage Signing Profiles section and create new ones if you don't have already



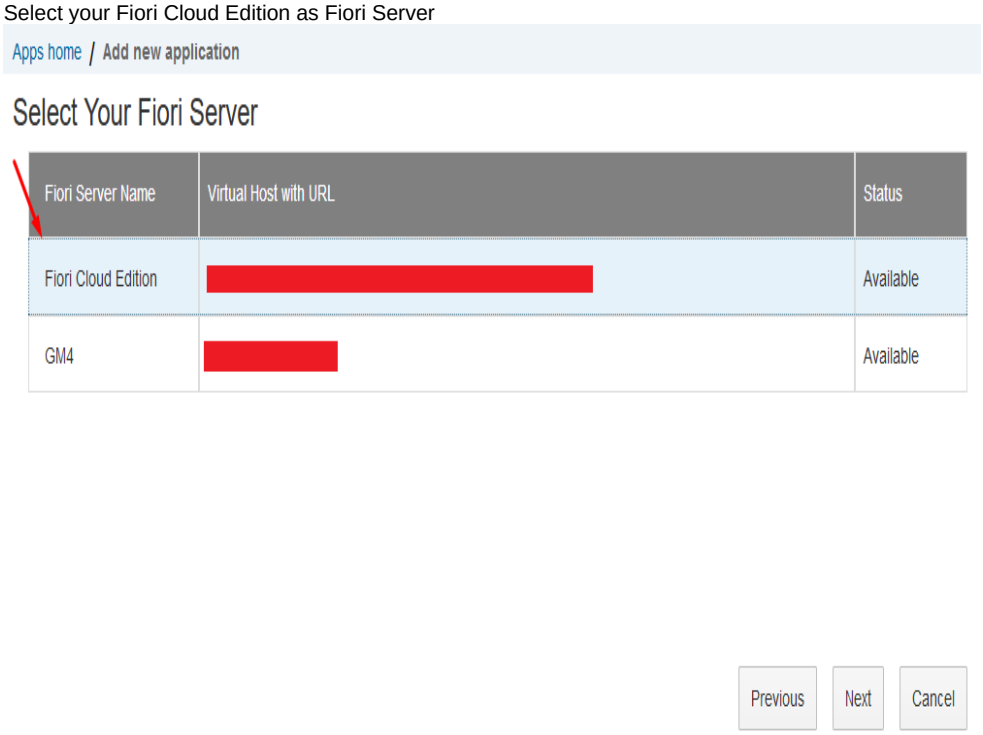
- Now open Manage Apps section and create New Application



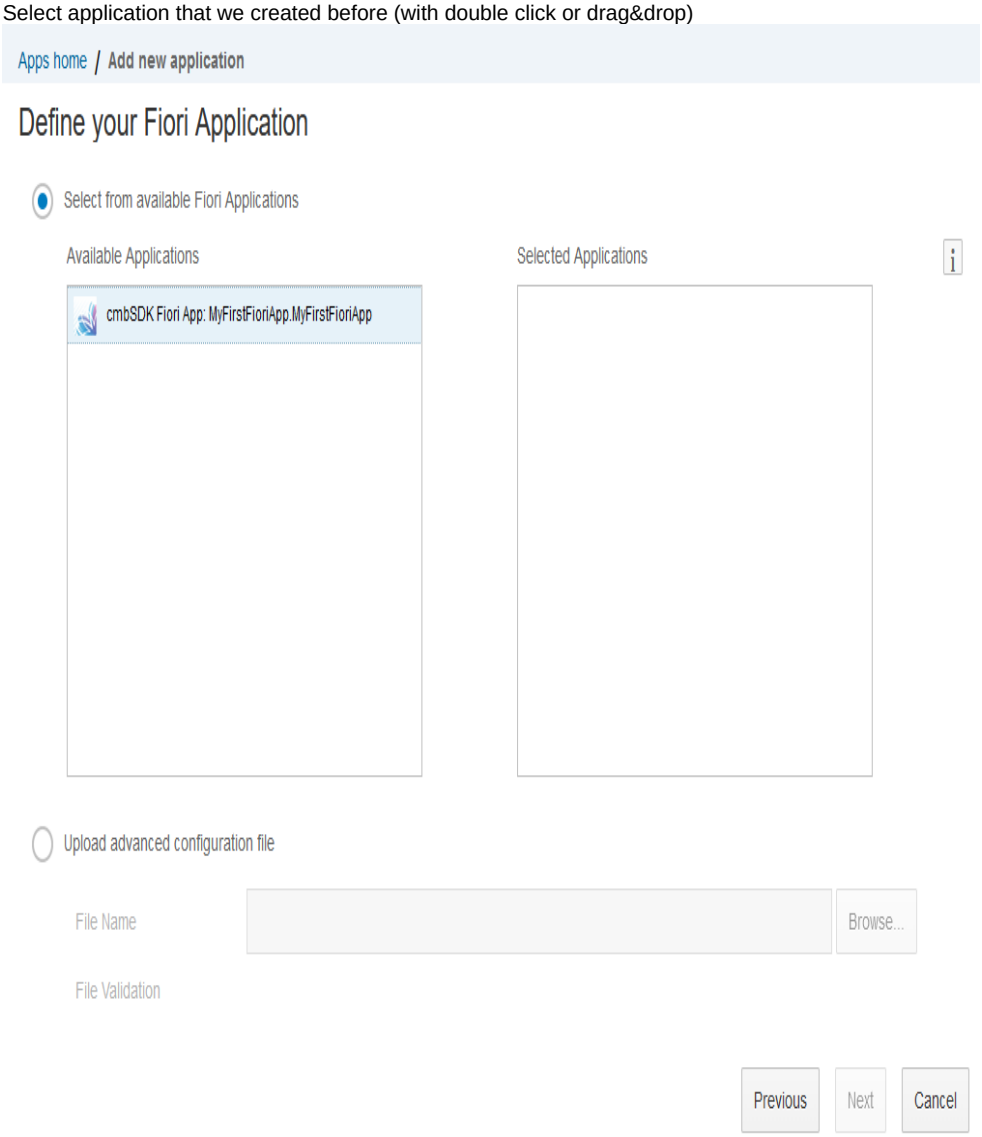
- Select first option



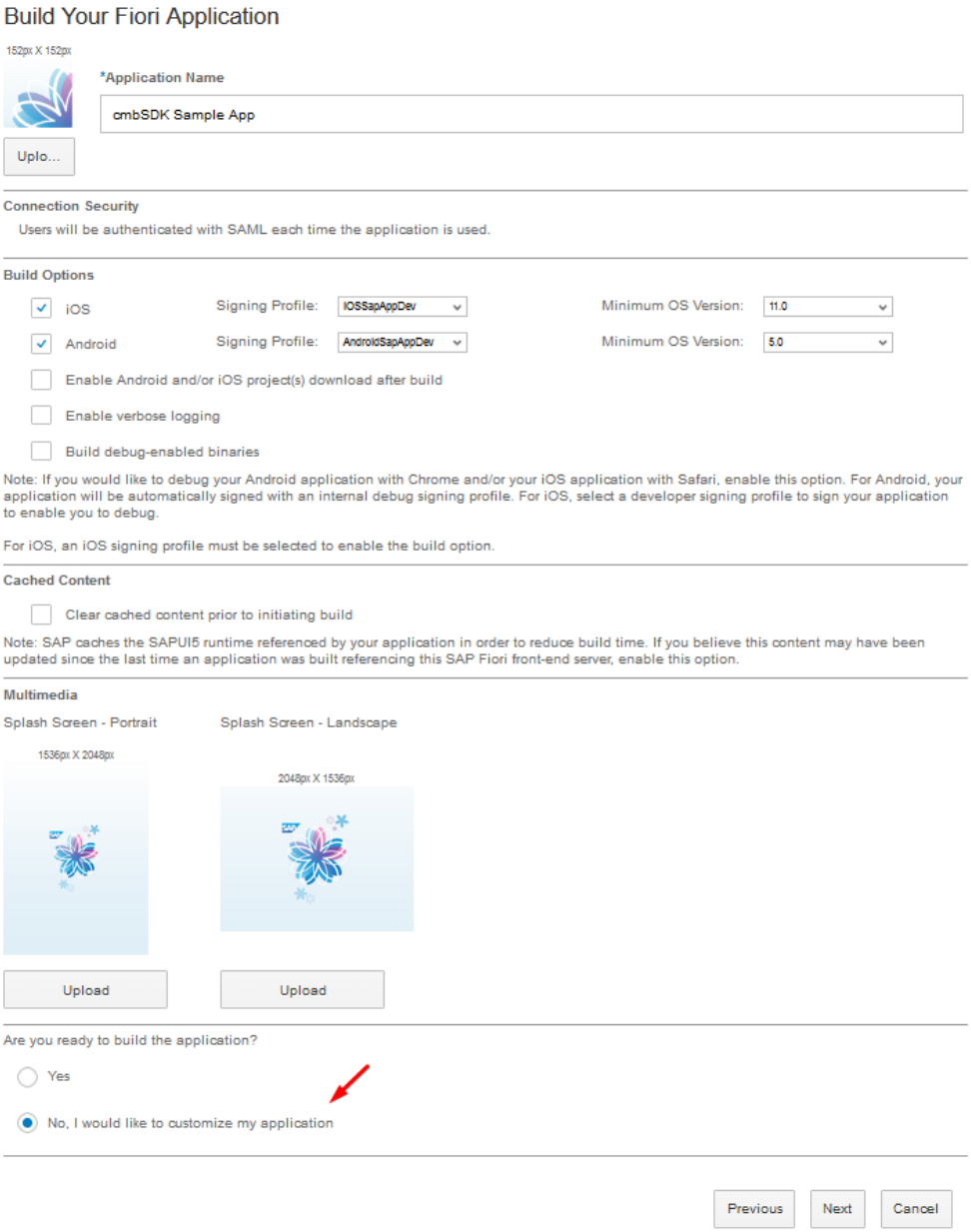
- Select your Fiori Cloud Edition as Fiori Server



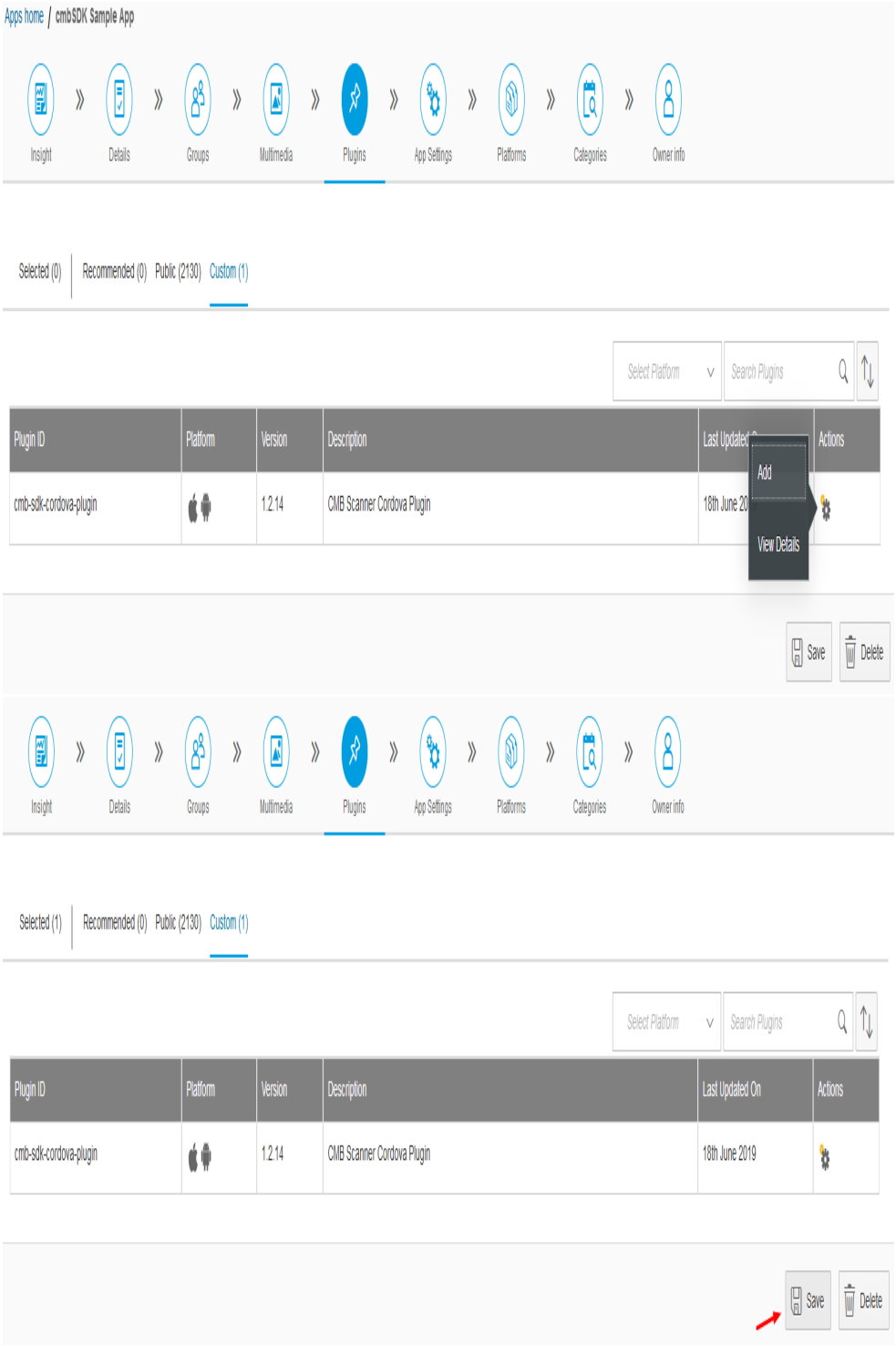
- Select application that we created before (with double click or drag&drop)



- Set you application name and signing profiles. At the bottom of page you have question "Are you ready to build the application ?". Select "No, I would like to customize my application".

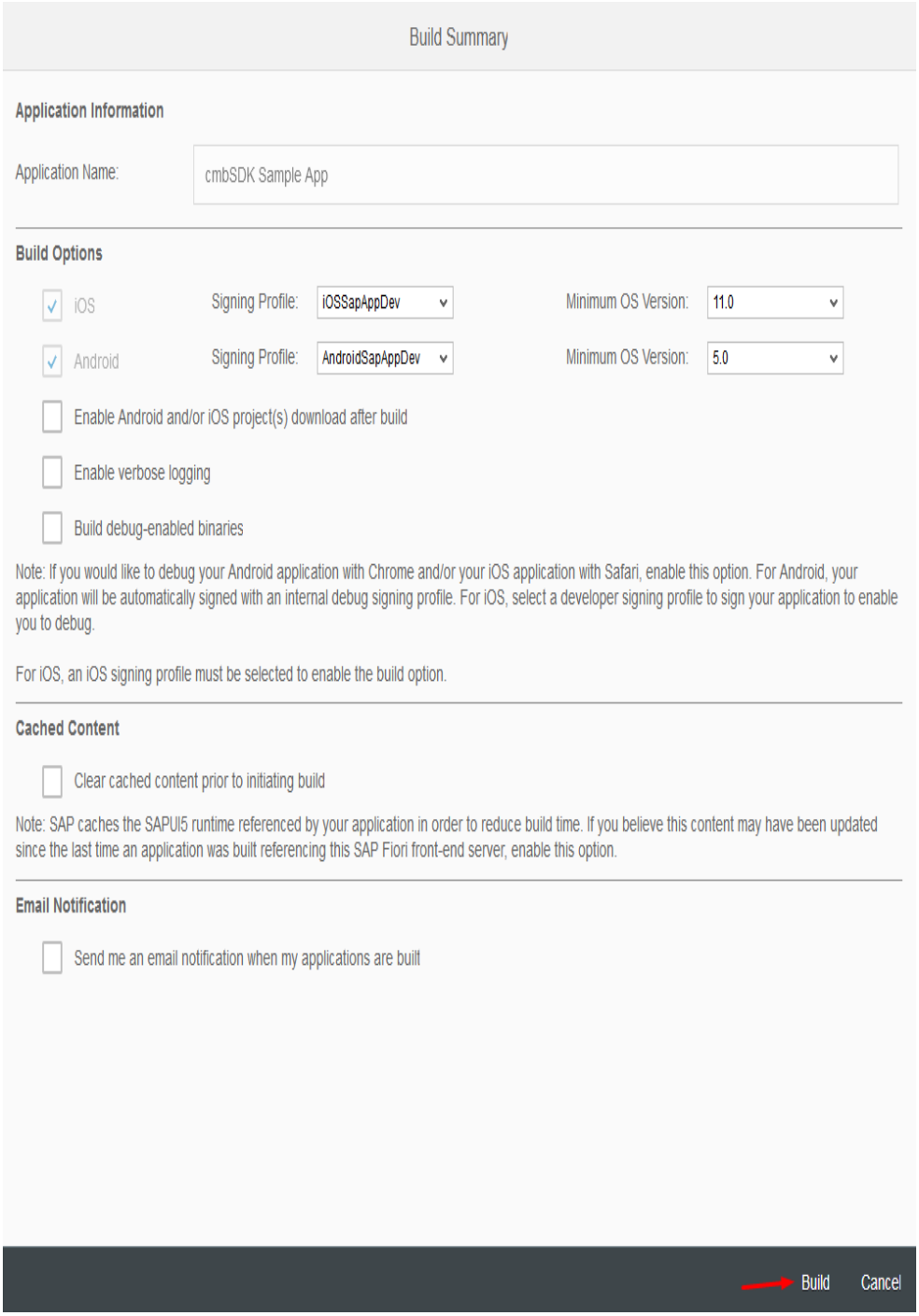


- Window where we can continue with app customization will be opened. From here we will add plugin that we uploaded before and disable passcode screen. You can set some others parameters per your needs. Also important thing here is to save every change that will be made.

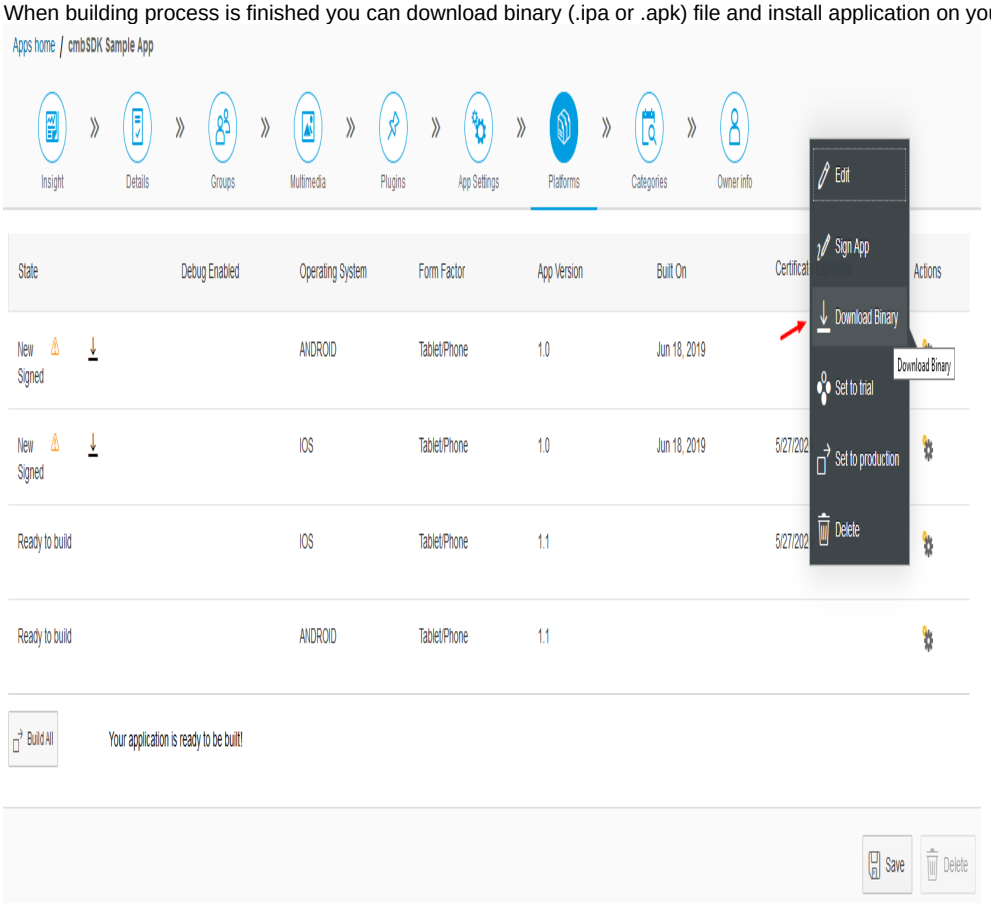

Apps home / cmbSDK Sample App
Insight
Details
Groups
Multimedia
Plugins
App Settings
Platforms
Categories
Owner info
Selected (0)
Recommended (0)
Public (2130)
Custom (1)
Select Platform
Search Plugins
Plugin ID
Platform
Version
Description
Last Updated On
Actions
cmb-sdk-cordova-plugin
1.2.14
CMB Scanner Cordova Plugin
Add
View Details
Save
Delete
Selected (1)
18th June 2019

- We are ready to build our mobile application and generate .ipa and .apk files. Navigate to Platforms and click **Build All** button if you want to build both iOS and Android platform together, or you can build one by one from Actions grid column.

Build popup will be shown. Click Build button and wait while building process finish.


Build Summary
Application Information
Application Name:
cmbSDK Sample App
Build Options
iOS
Signing Profile:
iOSSapAppDev
Minimum OS Version:
11.0
Android
Signing Profile:
AndroidSapAppDev
Minimum OS Version:
5.0
Enable Android and/or iOS project(s) download after build
Enable verbose logging
Build debug-enabled binaries
Note: If you would like to debug your Android application with Chrome and/or your iOS application with Safari, enable this option. For Android, your application will be automatically signed with an internal debug signing profile. For iOS, select a developer signing profile to sign your application to enable you to debug.
For iOS, an iOS signing profile must be selected to enable the build option.
Cached Content
Clear cached content prior to initiating build
Note: SAP caches the SAPUI5 runtime referenced by your application in order to reduce build time. If you believe this content may have been updated since the last time an application was built referencing this SAP Fiori front-end server, enable this option.
Email Notification
Send me an email notification when my applications are built
Build
Cancel

- When building process is finished you can download binary (.ipa or .apk) file and install application on your mobile device

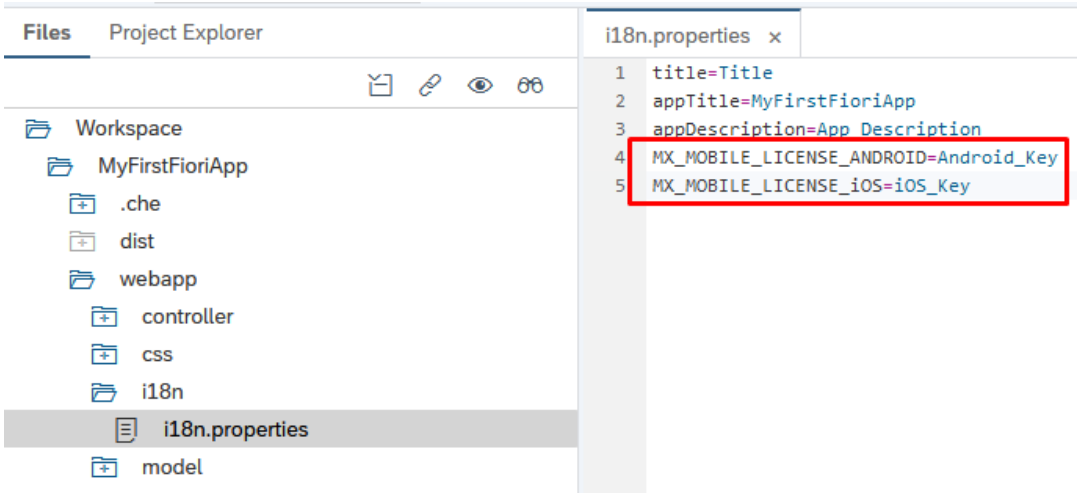


Licensing the SDK

If you plan to use the **cmbSDK** to do mobile scanning with a smartphone or a tablet (without the MX mobile terminal), the SDK requires the installation of a license key. Without a license key, the SDK will still operate, although scanned results will be blurred (the SDK will randomly replace characters in the scan result with an asterisk character).

Contact your Cognex Sales Representative for information on how to obtain a license key including trial licenses which can be used for 30 days to evaluate the SDK.

After obtaining your license key open i18n.properties file in your project on SAP WEB IDE service, and set your obtained keys.



Then go back to the *Component.js* file and check this code:

```
...

var sdkKEY = "";
if (Device.os.android)
   sdkKEY = this.getModel("i18n").getProperty("MX_MOBILE_LICENSE_ANDROID");
else
   sdkKEY = this.getModel("i18n").getProperty("MX_MOBILE_LICENSE_iOS");

cmbScanner.registerSDK(sdkKEY);

...
```

You can see that you read this key from i18n.properties and call **cmbScanner.registerSDK** method to register SDK with your license key.