SAP Fiori Mobile (v2.5.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.

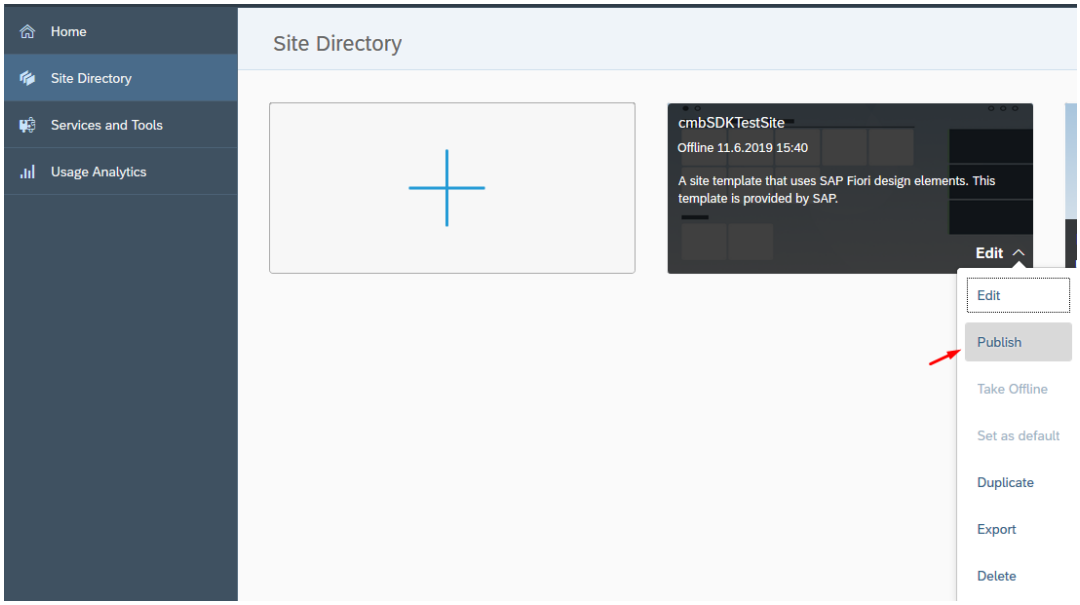
There are some facets to the technology which don't feel mature yet. One area is the offline OData features. When using Fiori Mobile things work differently to the more conventional hybrid and native apps. One example would be the destinations, because Fiori Mobile apps use a generated destination which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

- Sign up for a free account for the SAP Hana Cloud Platform, and activate you account from your mail activation link that you receive.
- Once you have activated your account browse on HCP Cockpit.
- Choose Trial Region and open your Personal Trial Account.


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
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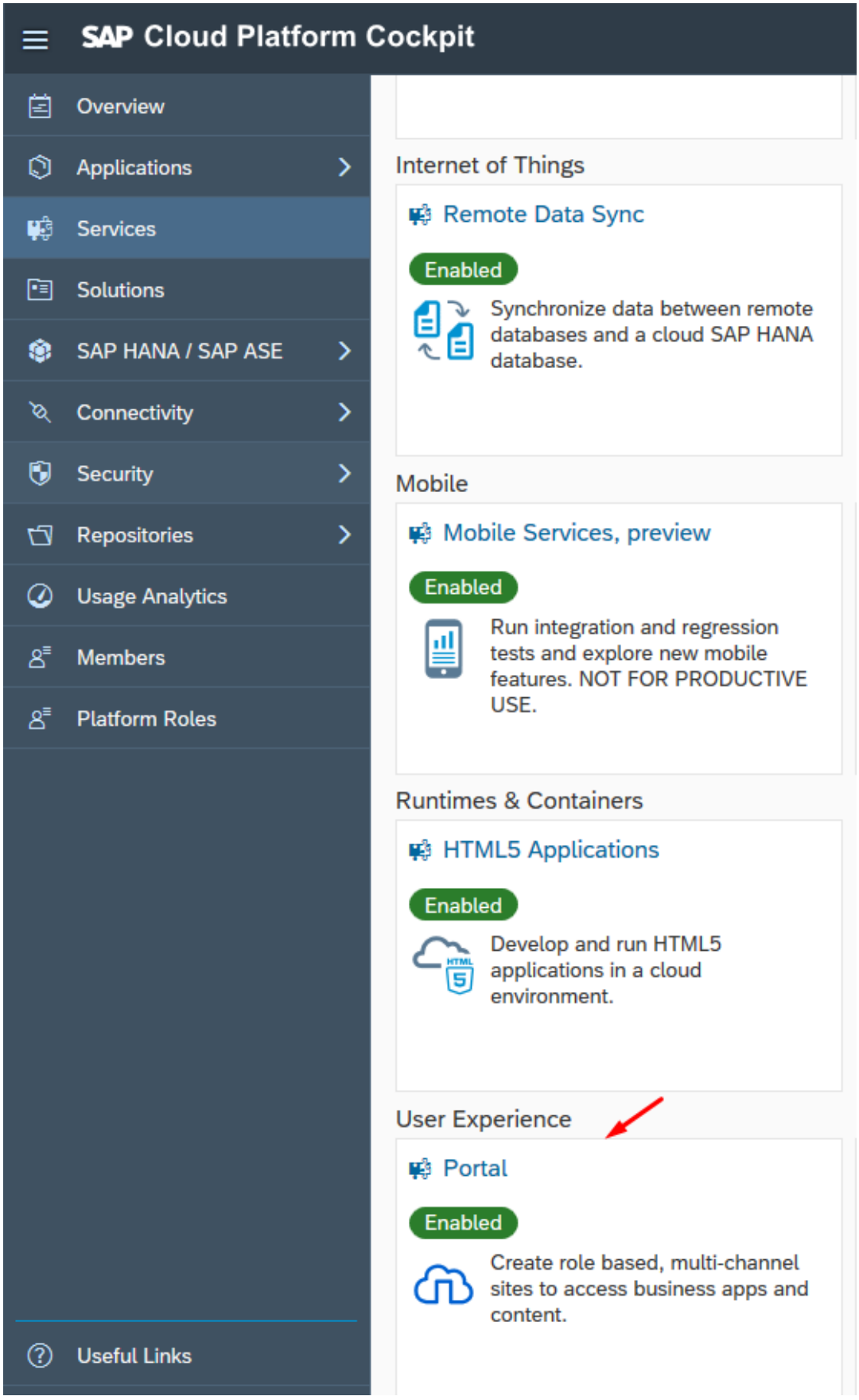
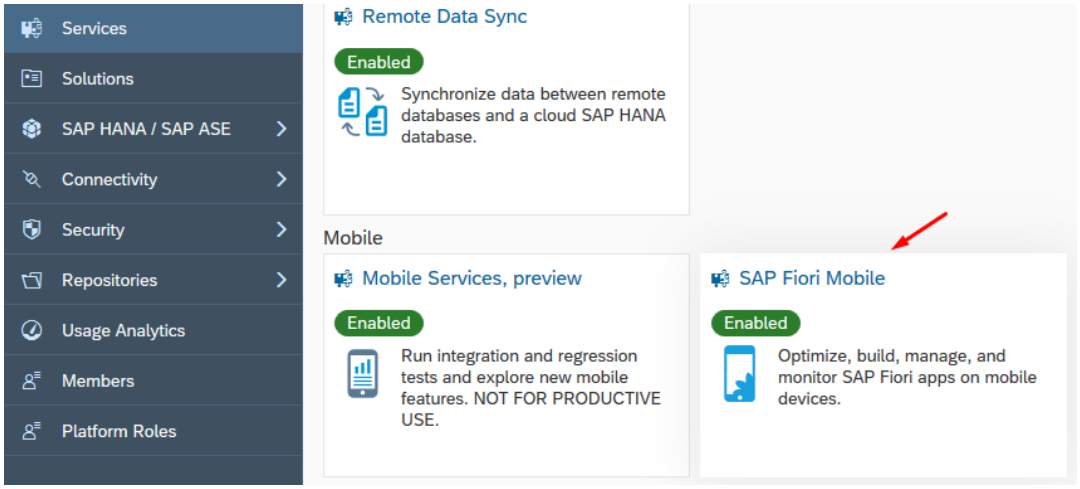
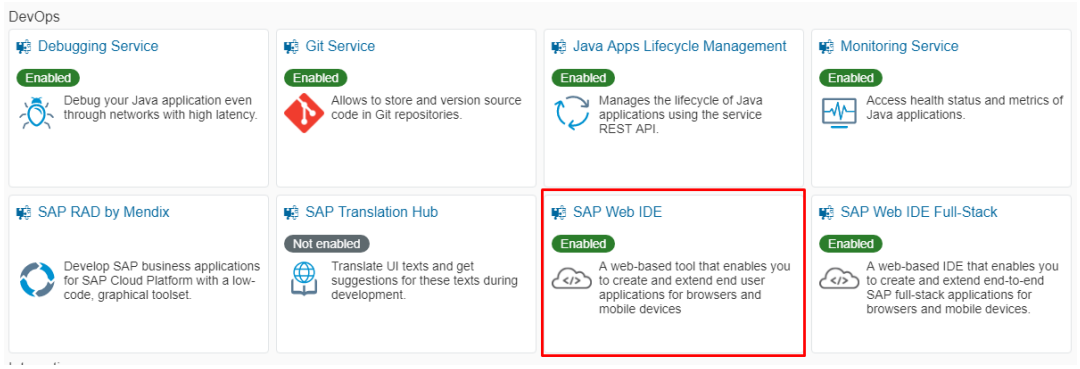
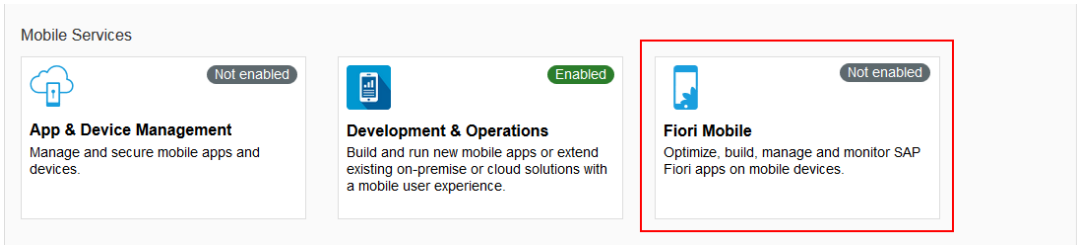


To create Fiori Mobile Application you will need to use **Portal**, **SAP Web IDE** and **Fiori Mobile** services.

Go in Services tab find these services and enable them if they are disabled.



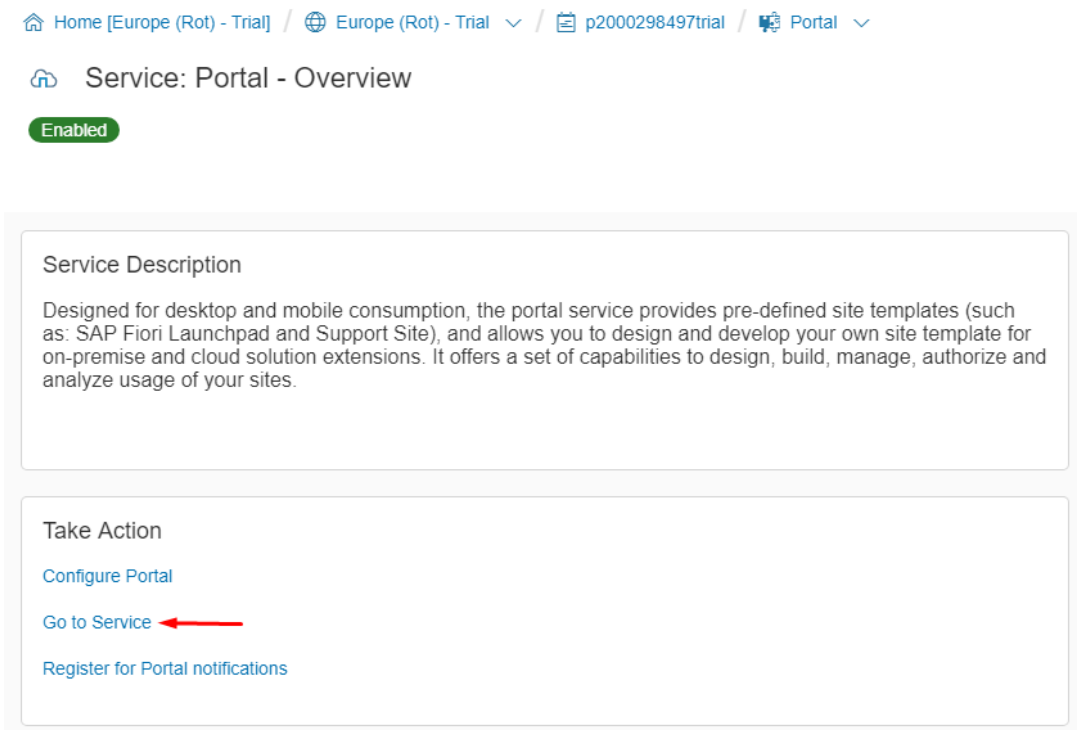




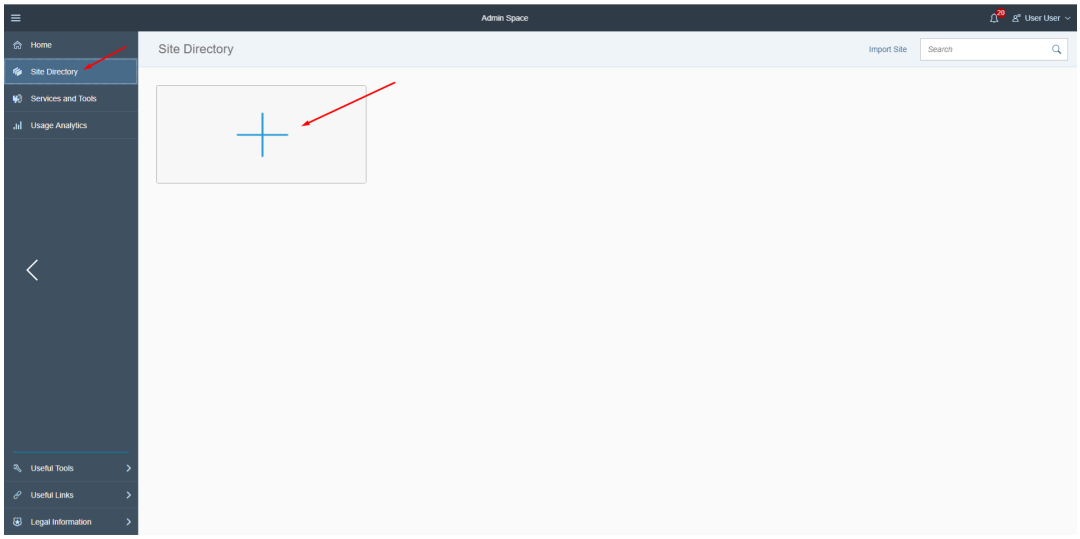
Create Fiori Launchpad

To create Fiori Application we need to create and publish the Site where application will be deployed.

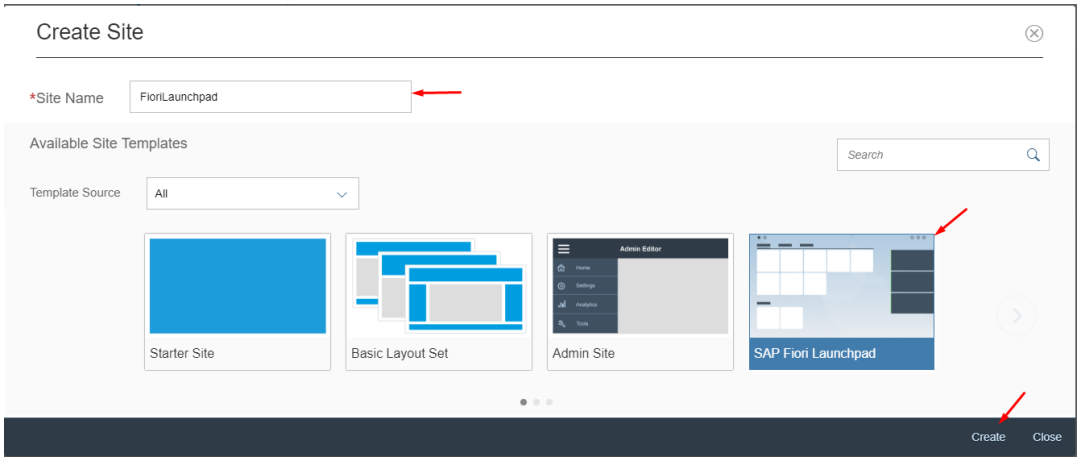
Go to **Portal Service** and click Go to Service.



In your browser a new tab will be opened. In this new window go to the **Site Directory** tab, and click on Create Site.

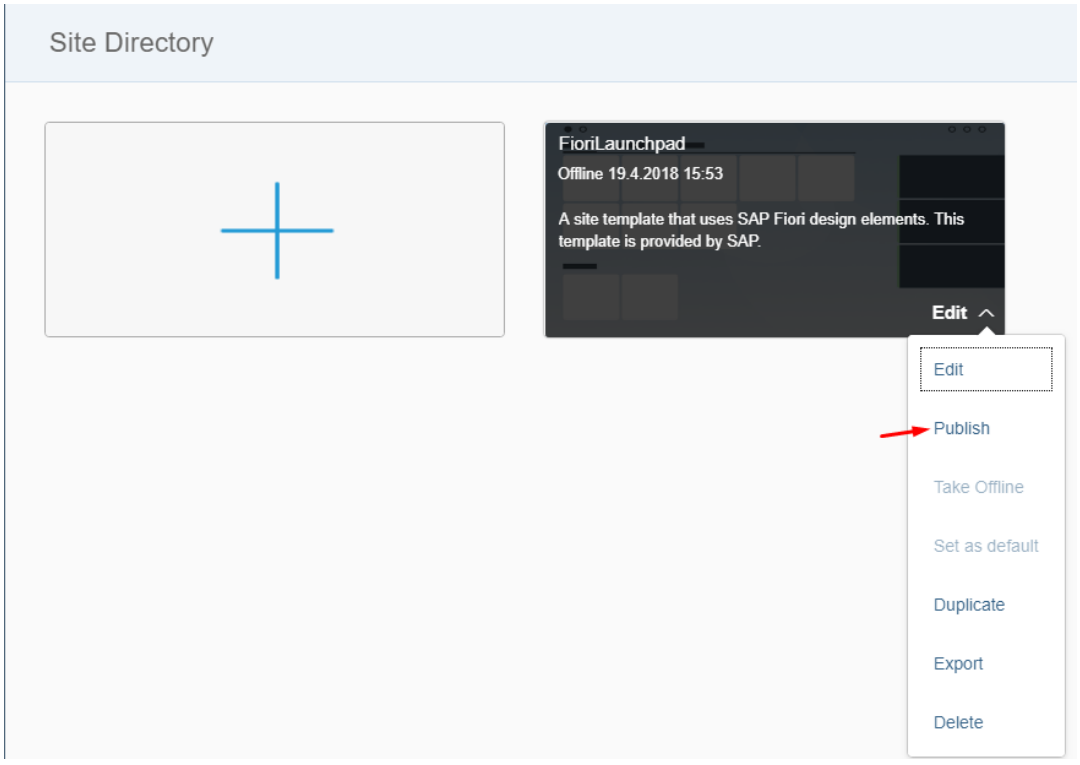


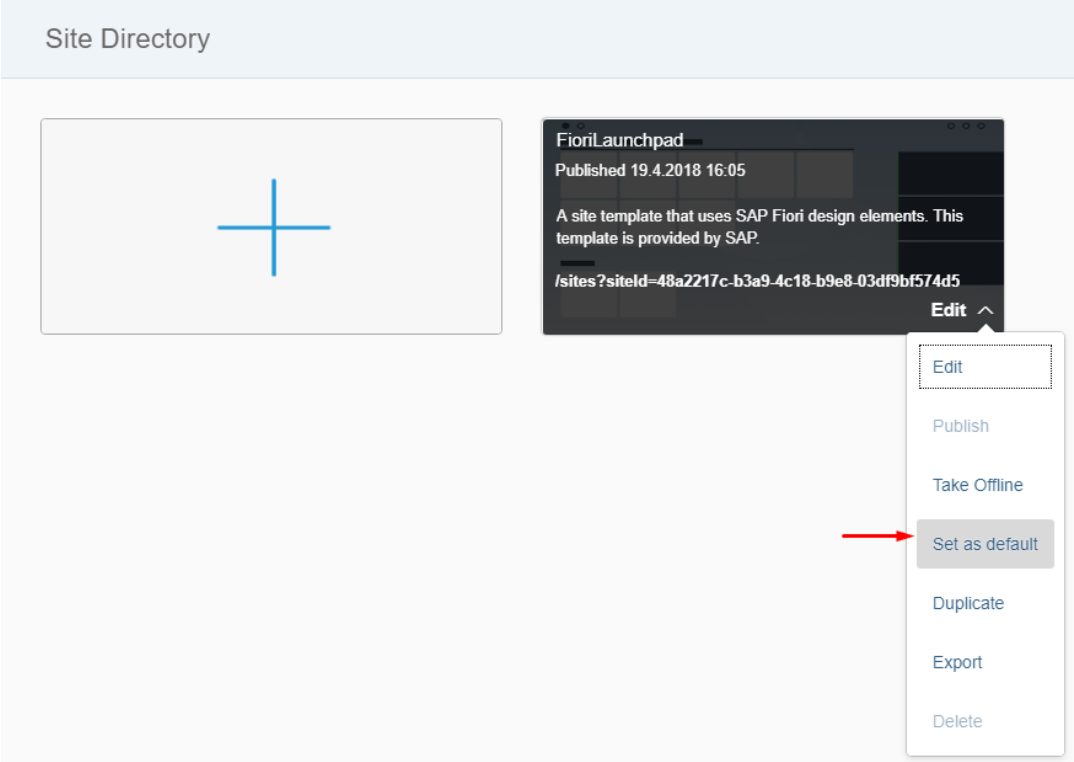
A popup will be displayed. Enter your **Site Name**, choose **SAP Fiori Launchpad** as Template Source and click Create



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.

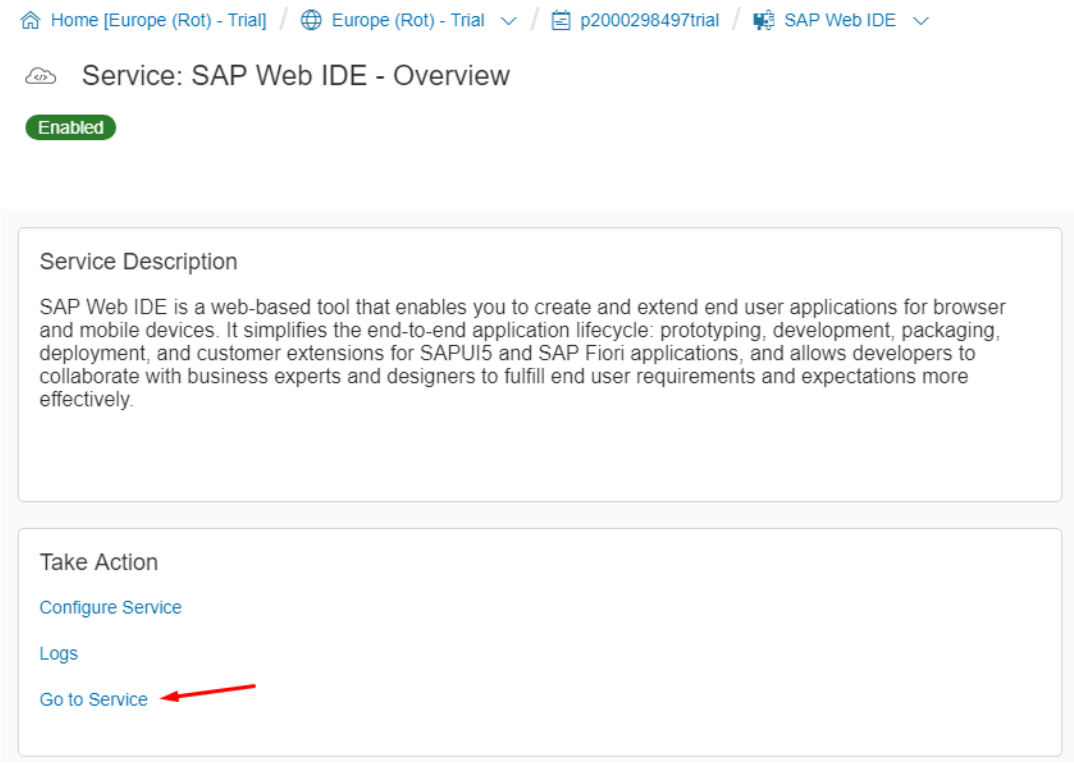




Create Fiori Project

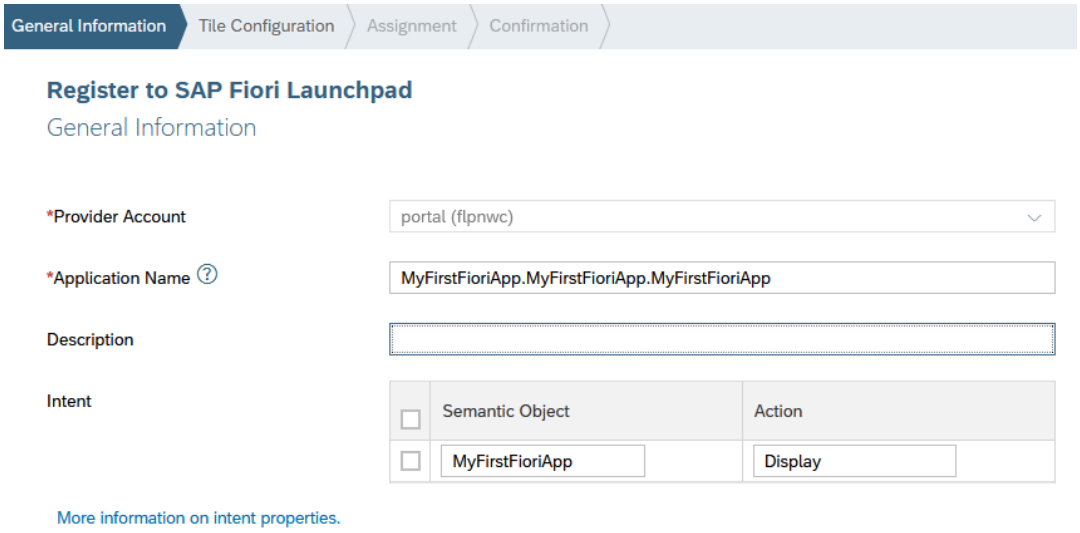
Once we create and publish the Site we can create our Fiori project.

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

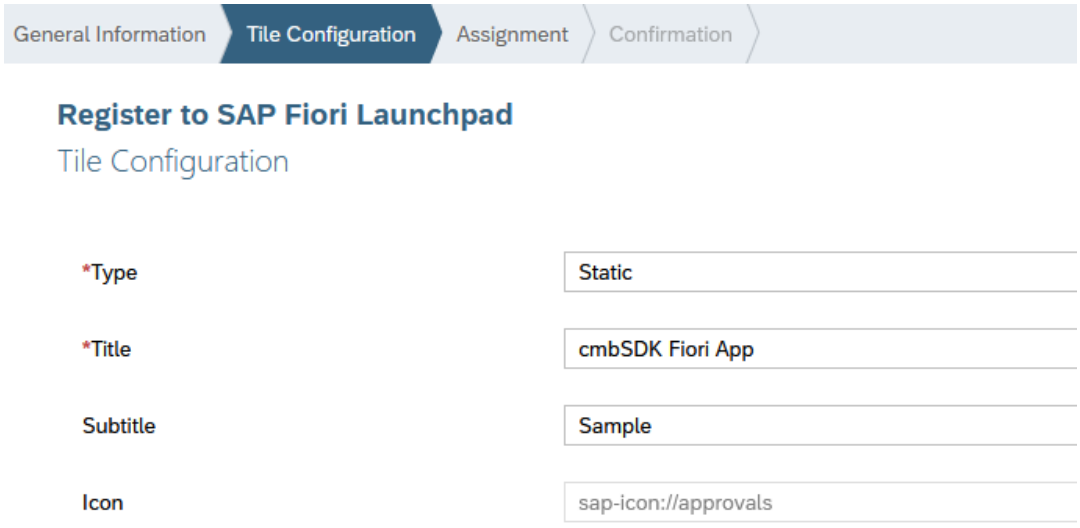


A new tab will be opened. From here we will start to create our Fiori project.

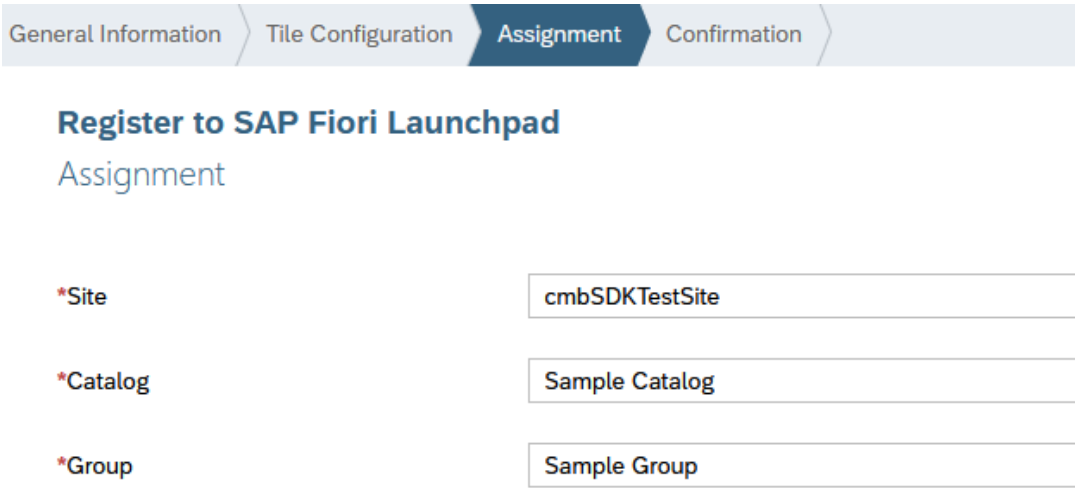
- Click on New Project from Template



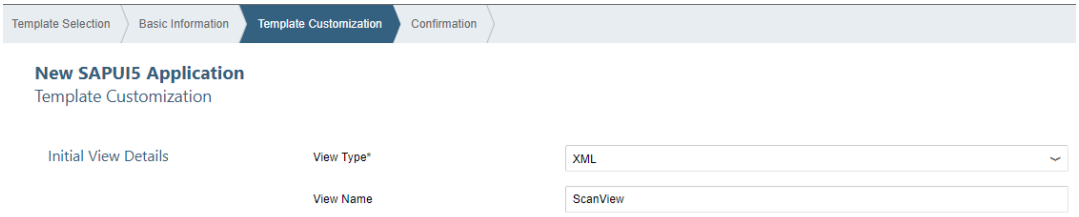
- Choose SAPUI5 Application from Template Selection



- Set your Project Name

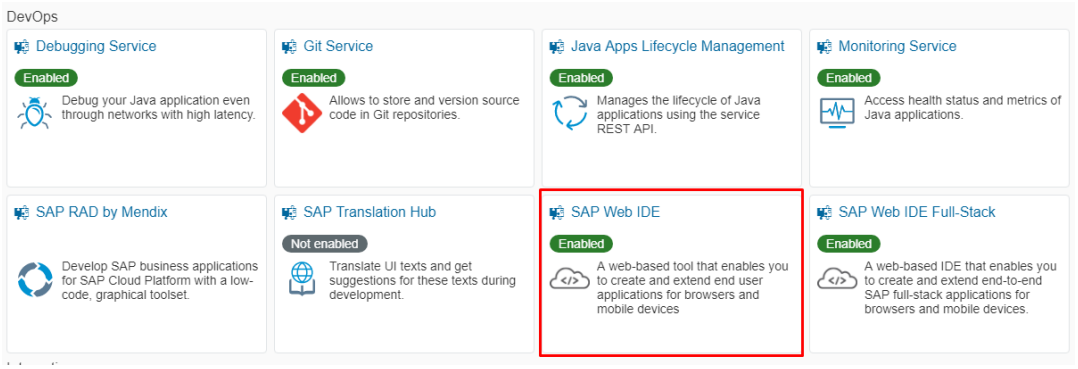


- Choose the View Type and set the View Name. In our sample we will use XML View. Click Finish and your Fiori project is created.



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",
 "MyFristFioriApp/model/models"
], function(UIComponent, Device, models) {
 "use strict";

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

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

  metadata: {
   manifest: "json"
  },

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

   // 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");
  }

  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, (res) => {
   switch (res) {
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_OK:

     break;
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_KEY:

     break;
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_CHECKSUM:

     break;
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_APPLICATION:

     break;
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_SDK_VERSION:

     break;
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_KEY_VERSION:

     break;
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_PLATFORM:

     break;
    case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_KEY_EXPIRED:

     break;
    default:
     break;
   }
  });

 } 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) => {
     window.scannerActive = result;
    });

    cmbScanner.setPreviewOptions(cmbScanner.CONSTANTS.PREVIEW_OPTIONS.DEFAULTS | cmbScanner.CONSTANTS.PREVIEW_OPTIONS.HARDW
    cmbScanner.setCameraMode(cmbScanner.CONSTANTS.CAMERA_MODES.NO_AIMER);

    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 fromreader 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.

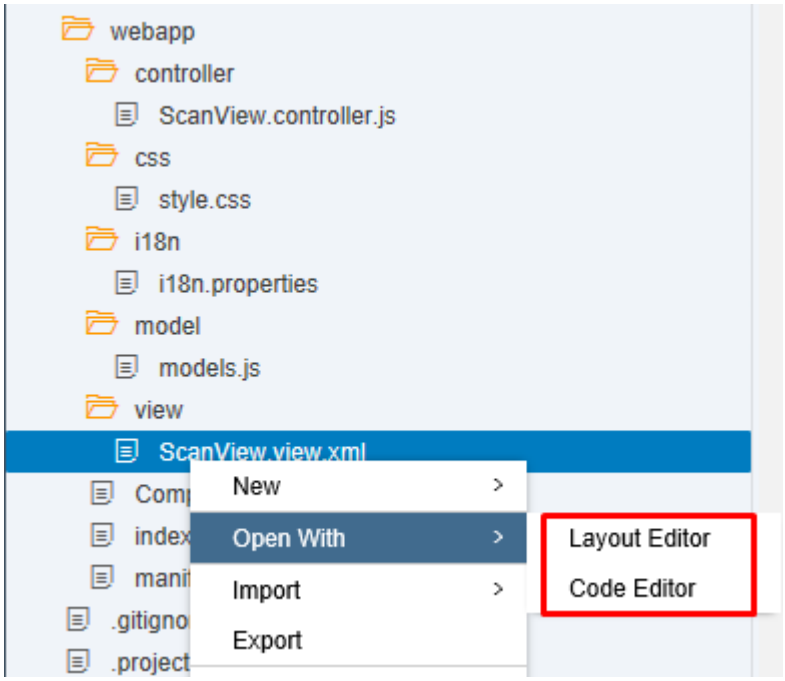
Here we are only configuring reader device, handling connections, availability, etc.. We will do scanning and getting results in other views. If we want to notify users about every connection state changed or other info about reader device we will be using EventBus sap object. With this object we can 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 xmlns:mvc="sap.ui.core.mvc" xmlns:html="http://www.w3.org/1999/xhtml" xmlns:core="sap.ui.core" controllerName="My
 <App xmlns="sap.m">
  <pages>
   <Page title="MWBCameraDemo" showHeader="false">
    <subHeader>
     <Toolbar id="__toolbar2" width="100%">
     <content>
```

```
        <FlexBox id="__box0" width="100%" alignContent="Center" alignItems="Start" direction="Column" fitContainer="true"
            <items>
                <Select id="selectActiveDevice" items="{/Devices}" textAlign="Center" selectedKey="0" change="activeDevice
       <core:Item text="{text}" key="{key}" />
      </Select>
            </items>
        </FlexBox>
        <Label id="lblStatus" text="DISCONNECTED" width="100%" textAlign="End" design="Bold" />
    </content>
    </Toolbar>
   </subHeader>
   <content>
    <FlexBox id="flexBoxContainer" width="100%" alignContent="Start" alignItems="Start" direction="Column" fitContainer="t
   </content>
   <footer>
    <Toolbar id="__toolbar1" width="100%">
     <content>
      <Button id="btnScan" press="btnScanPress" text="Scan" width="100%" />
     </content>
    </Toolbar>
   </footer>
  </Page>
 </pages>
</App>
</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("MyFristFioriApp.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.readString) {

     var verticalLayoutContainer = new sap.ui.layout.VerticalLayout(null, {
      width: "100%"
     }).addStyleClass("sapUiSmallMarginTop");

     verticalLayoutContainer.addContent(new sap.m.Label({
      text: result.symbologyString + ":",
      textAlign: "Begin",
      design: "Bold"
     }).addStyleClass("sapUiSmallMarginBegin"));
     verticalLayoutContainer.addContent(new sap.m.Text({
      text: result.readString,
      textAlign: "Begin"
     }).addStyleClass("sapUiSmallMarginBegin"));

     this.getView().byId("flexBoxContainer").addItem(verticalLayoutContainer);
    }
   });
  },

  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;
    });
   }

  });
});
```

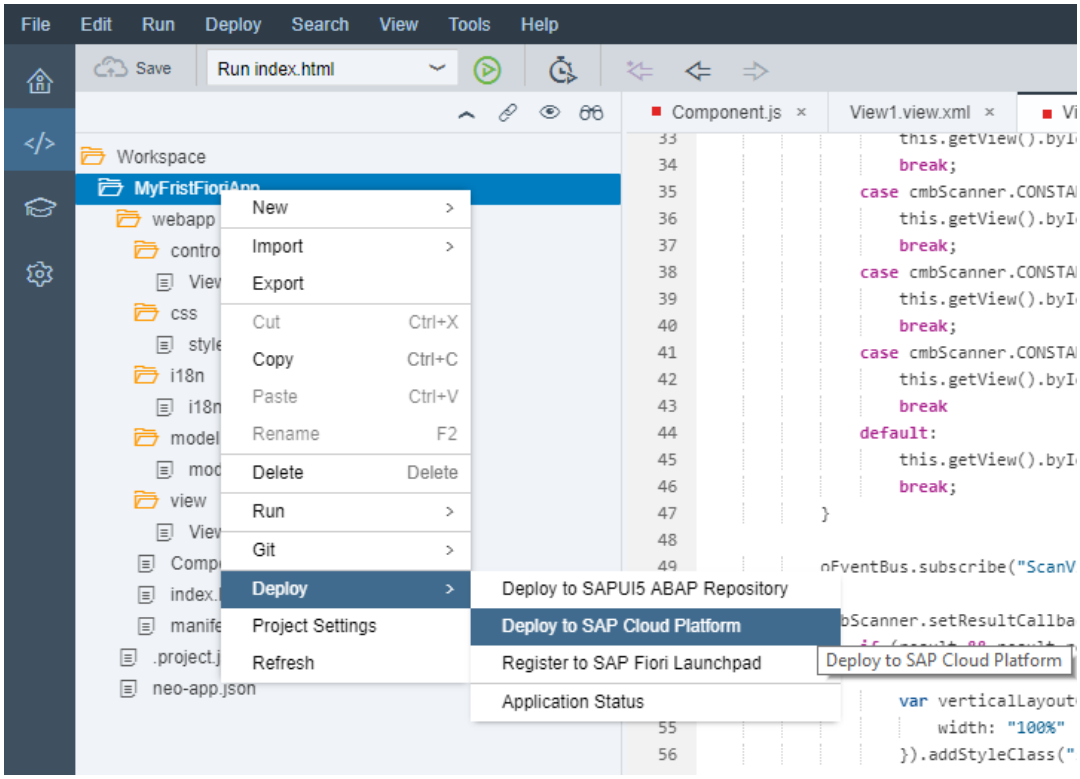
In this view we have a Scan button to startScanning()/stopScanning() and cmbScanner.setResultCallback to handle successful scan results.

Deploy app to HCP

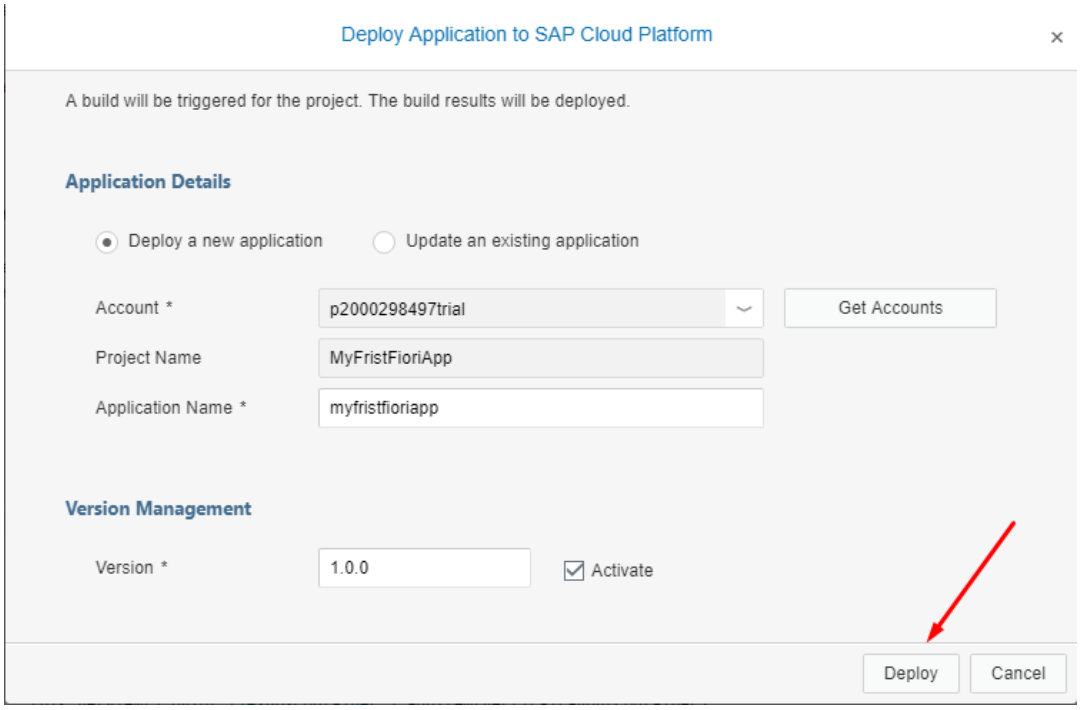
After we finish creating and developing our Fiori project we need to prepare for mobile deployment.

First we need to deploy our project on SAP HANA Cloud Platform.

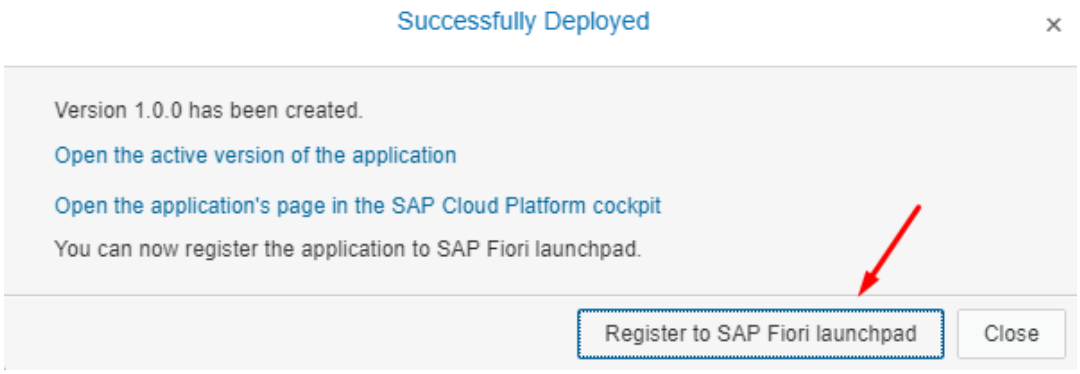
- Right click on project folder then select Deploy and choose Deploy to SAP HANA Cloud Platform



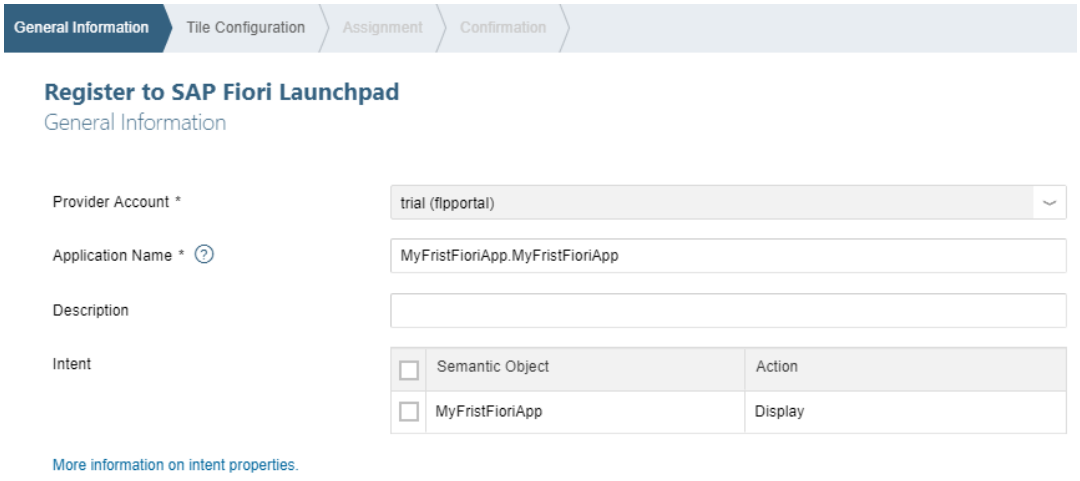
- Set application details and click Deploy



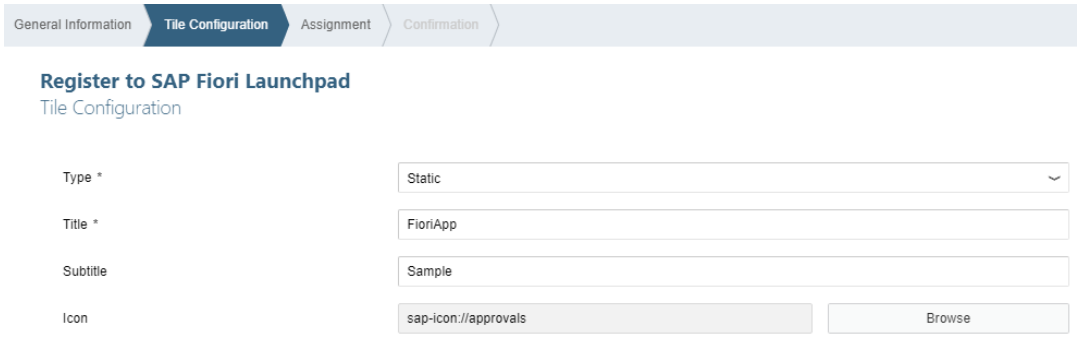
- After a successful deploy, the next step is to Register to SAP Fiori launchpad that we've created in the previous section.



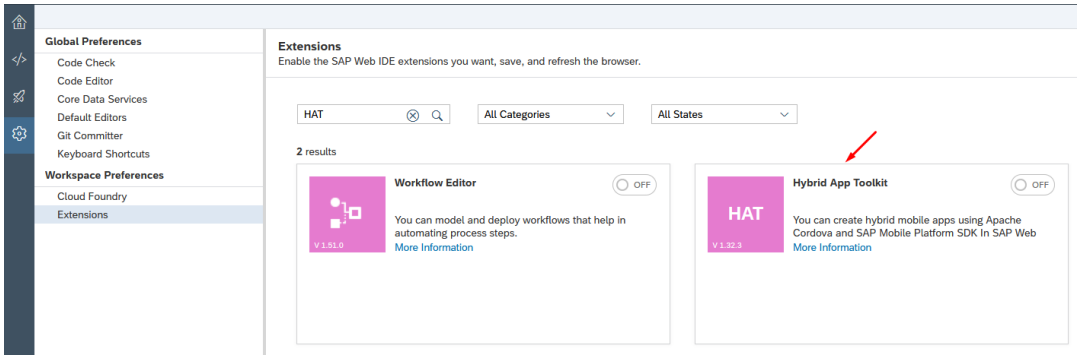
- Choose account and set application name.



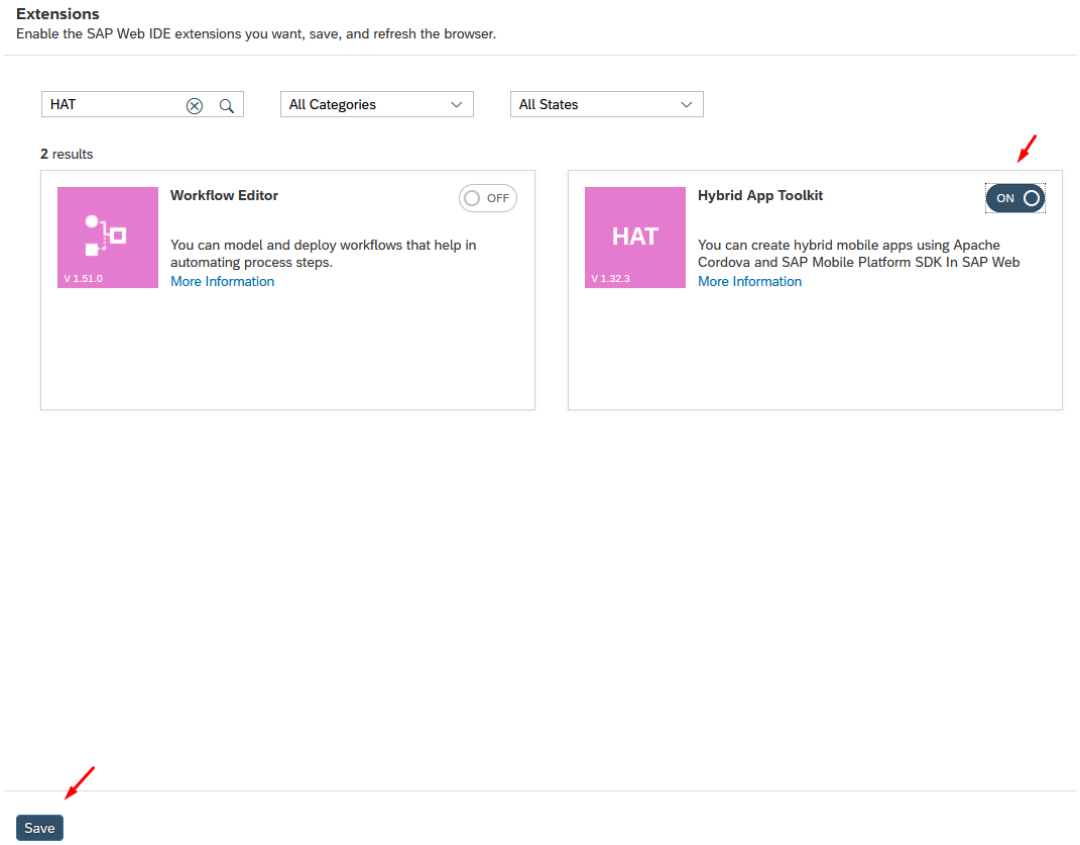
- Set Type (Static by default), set Title, and Subtitle.



- 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.



Build Fiori Mobile Application

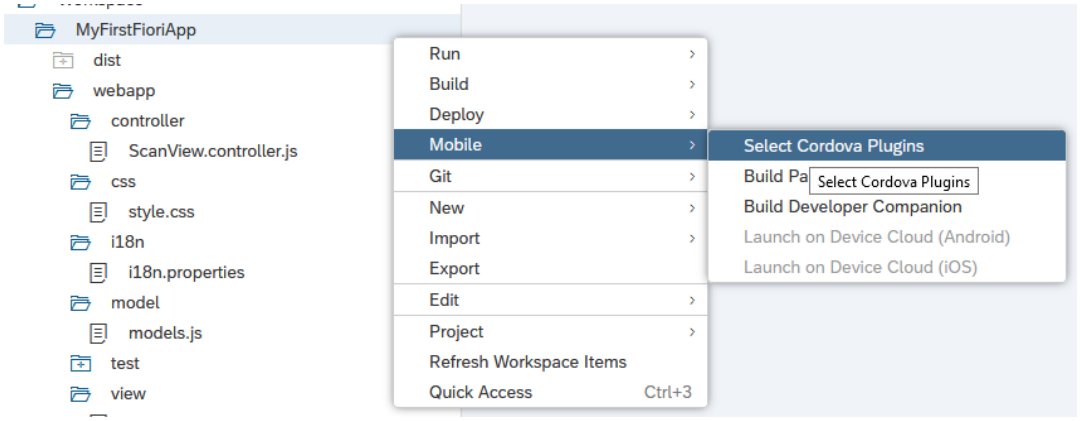
A

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:

```
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");
      }

      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, (res) => {
       switch (res) {
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_OK:
         break;
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_KEY:
         break;
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_CHECKSUM:
         break;
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_APPLICATION:
         break;
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_SDK_VERSION:
         break;
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_KEY_VERSION:
         break;
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_INVALID_PLATFORM:
         break;
```

```
        case cmbScanner.CONSTANTS.REGISTER_RESULTS.REGISTRATION_KEY_EXPIRED:
         break;
        default:
         break;
       }
      });

...........
```

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

Checking result object which is sent back in callback function can tell us if registration is successful or what is the problem.