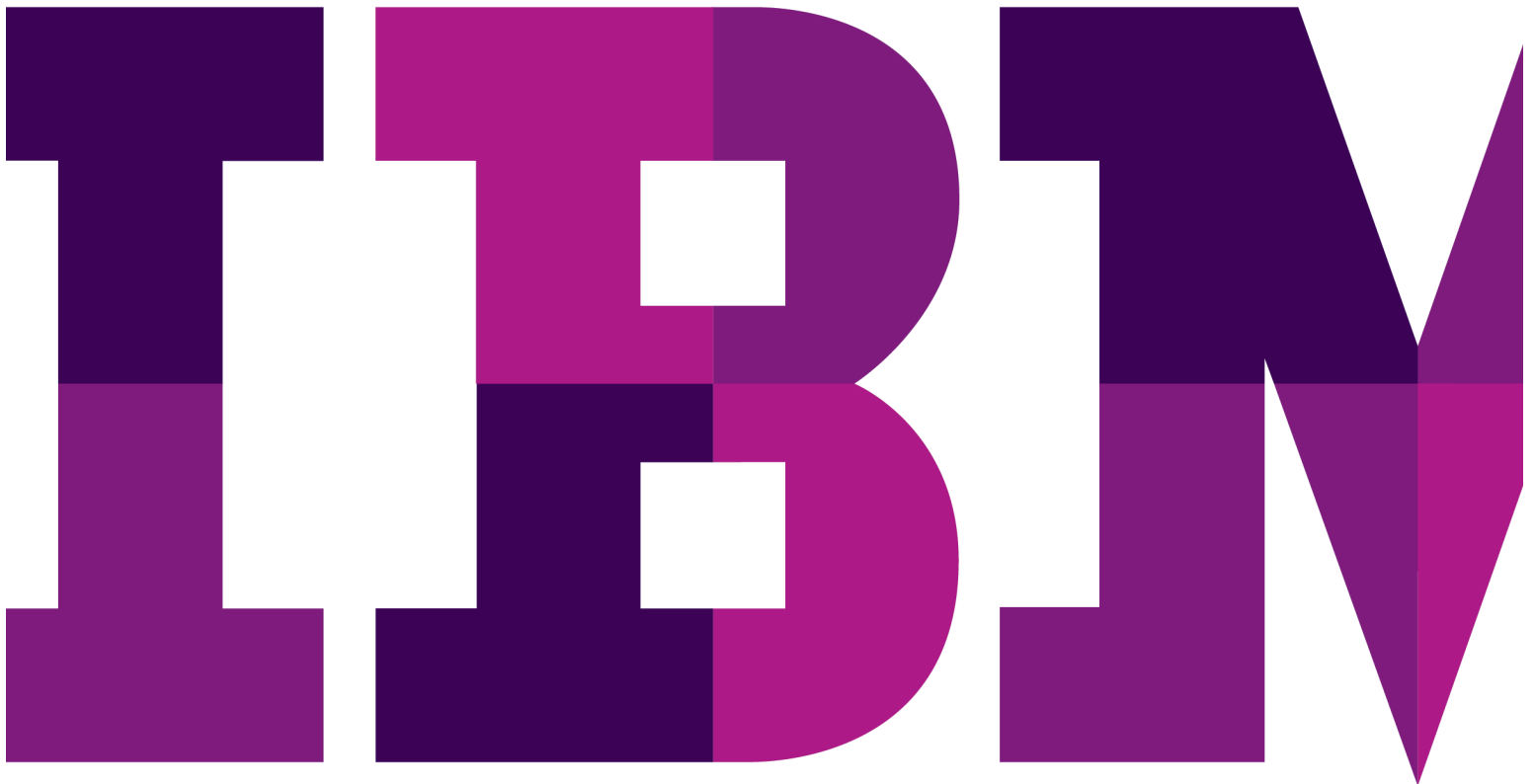


14111: Building an Enterprise Mobile Application

Lab Exercise



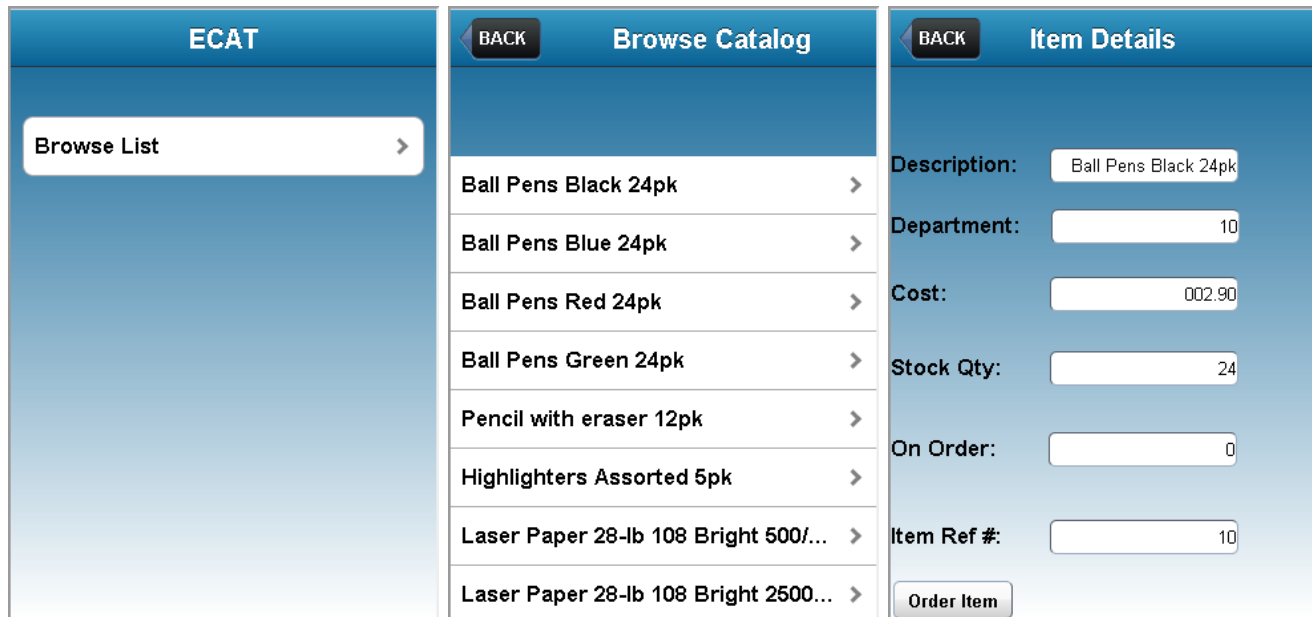
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Lab 1 Getting Started with IBM Worklight

In this lab you will develop a basic mobile app using the IBM Worklight Studio development environment. You will use cross platform techniques such as HTML5, CSS3, JavaScript and the Dojo Mobile framework. The app you will develop and use throughout this PoT is called ECAT and its purpose is to show you how you can quickly develop a mobile front end to interface and existing 3270 CICS application running on enterprise systems. The application that you are going to connect to is EGUI (CICS Catalog Manager Demo application).

Below are some screenshots from the fully developed application:



In this lab you will build a fully functional version of these three views in the rich page editor.

Upon completion of this exercise you should have gained basic understanding of

- How to create a Worklight project and a Worklight application in Worklight Studio
- How to build and deploy a Worklight application to the test server in the Worklight Studio
- How to preview and test an application from the Worklight Studio
- How to create Worklight Environments for platforms such as Android, iPhone, etc.
- How to use the Rich Page Editor to add UI elements to an application
- How to create and implement a Worklight Adapter (HTTP)
- How to run an application as a Web app

You should possess basic knowledge of HTML, CSS and JavaScript. Familiarity with the Eclipse platform is a plus, but not required.

1.1 Start the Worklight Studio

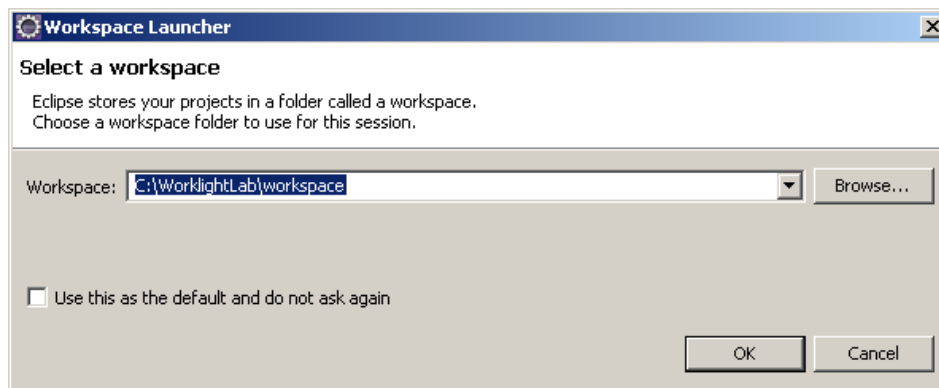
This lab assumes that you have obtained and started the corresponding VMWare image. In the image you will launch Eclipse with the Worklight Studio tooling and then create a project for the ECAT app.

__1. Start Worklight Studio

- __a. On the Desktop, double-click the **Worklight Studio** icon (shown below).



- __b. On the Workspace Launcher dialog accept the default workspace path **C:\WorklightLab\workspace** and click **OK**.



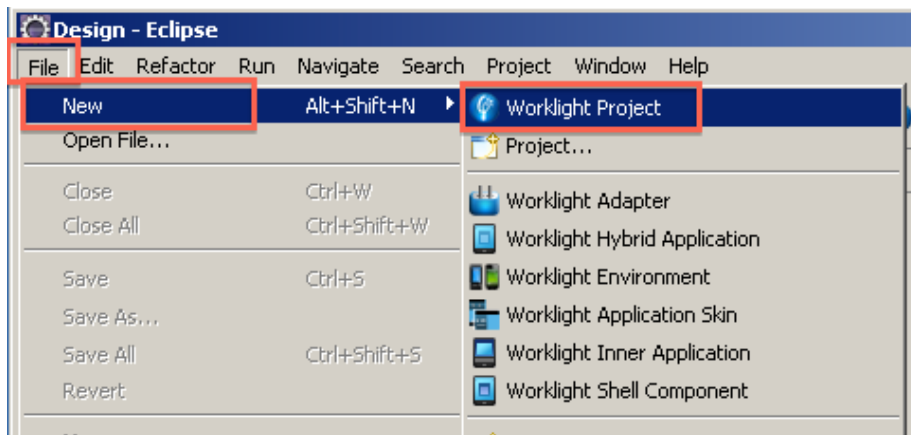
- __c. If you receive an Eclipse Welcome Screen, dismiss it by **closing** the *Welcome* tab.

1.2 Create the ECAT project and application

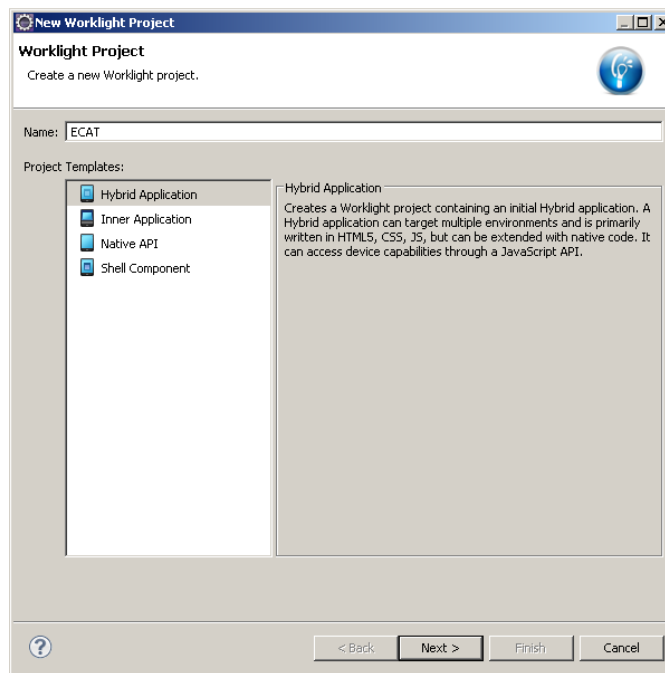
The application that you are building is actually EGUI (the CICS Catalog Manager sample application), the eCAT name was something that was inherited from some other work.

__1. Create ECAT project

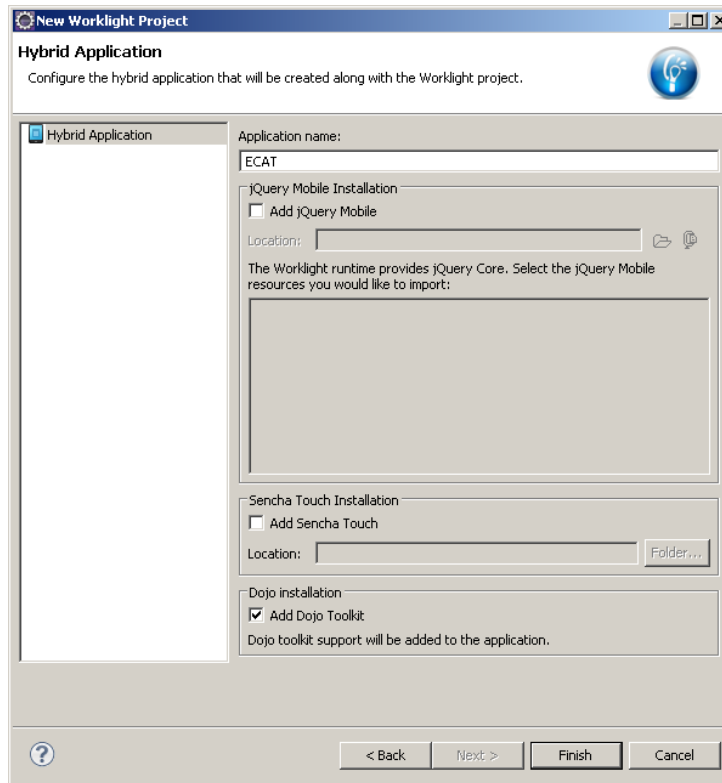
__a. Select **File > New > Worklight Project**.



c) Enter **ECAT** as the project name, keep the default Project Templates selection for **Hybrid Application** and click **Next**.

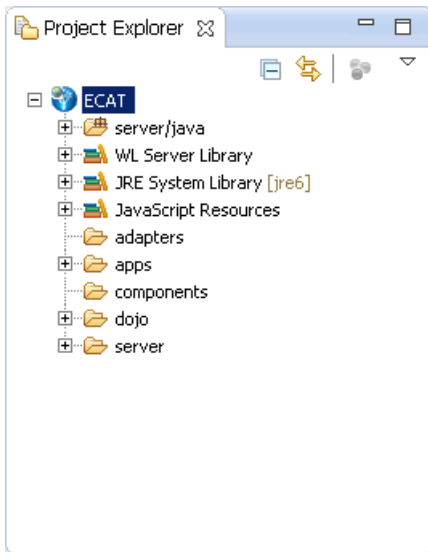


- d) The Hybrid Application panel will surface noting that you have not specified an Application name. Enter **ECAT** for the Application Name and check the box to **Add Dojo Toolkit**. Click **Finish**



The application template will be populated and the **application-descriptor.xml** file will open by default. Application characteristics such as authentication and server URL are managed in this file. We can **leave it at its defaults** for now, while we investigate the parts of a Worklight project and application.

- e) In the *Project Explorer* pane, expand the **ECAT** project. Review the folder structure that has been created.



WL Server Library

Contains the Worklight API jar file

server/java

Location for server-side java code in java-base adapters (advanced)

JRE System Library

Contains the JRE used in this project

JavaScript Resources

Contains the project's JavaScript classes content

adapters:

Contains the project's adapters (used for backend connectivity)

apps:

Contains the project's applications

bin:

Location for build artifacts (wlapp files) that are deployed to a Worklight server

components

Contains shell application components (advanced)

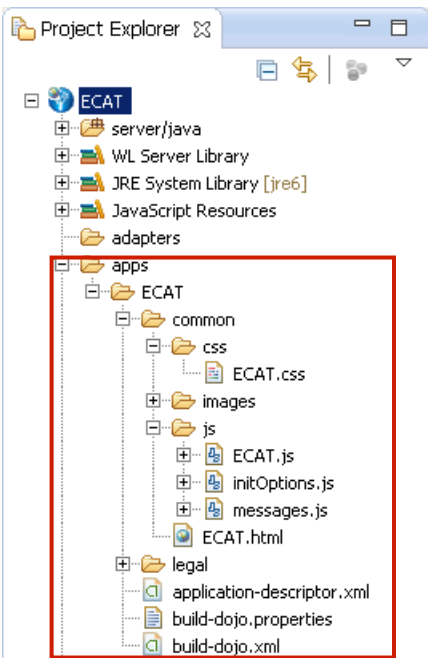
dojo

Contains the Dojo Toolkit JavaScript source

Server

Contains configuration files and extension locations for the embedded Worklight test server

- f. In the *Project Explorer*, expand the **apps** folder then the **apps > ECAT** folder and the **apps > ECAT > common** folder that were created by the new application wizard.



common: the default 'environment' that gets created for an application.

css: **ECAT.css** – the main application CSS file, **reset.css** – brings all rendering engines to one common ground.

images: Default images for the common environment.

js: **ECAT.js** – the main JavaScript file for the app, **messages.js** – JSON object holding all app messages, **auth.js** – authentication mechanism.

ECAT.html: The main application html file. Application can have multiple html files

legal: All legal related documents.

application-descriptor.xml: Application's meta data (security config, server url, etc...)

build-dojo*: Artifacts related to custom dojo profile builds (advanced)

- __g. Open the **application-descriptor.xml** file, if not already opened. Switch to the **Source** tab. The following section specifies the application name, description and author's name to be displayed in the Worklight Console.

```

1  <?xml version="1.0" encoding="UTF-8"?>
2
3      <!-- Licensed Materials - Property of IBM
4          5725-G92 (C) Copyright IBM Corp. 2006, 2012. All Rights Reserved.
5          US Government Users Restricted Rights - Use, duplication or
6          disclosure restricted by GSA ADP Schedule Contract with IBM Corp. -->
7
8  <!-- Attribute "id" must be identical to application folder name -->
9  <application id="ECAT" platformVersion="5.0.5"
10     xmlns="http://www.worklight.com/application-descriptor"
11     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
12
13     <displayName>ECAT</displayName>
14     <description>ECAT</description>
15     <author>
16         <name>application's author</name>
17         <email>application author's e-mail</email>
18         <copyright>Copyright My Company</copyright>
19         <homepage>http://mycompany.com</homepage>
20     </author>

```

- __h. The **worklightRootURL**, is to be used as the root URL in generated mobile applications.

```

25  <worklightServerRootURL>http://${local.IPAddress}:8080</worklightServerRootURL>
26  <!--
27     Uncomment one of the following options to use a different value for the Worklight
28     <worklightServerRootURL>http://${local.hostname}:8080</worklightServerRootURL>
29     <worklightServerRootURL>http://${local.fullhostname}:8080</worklightServerRootURL>
30     <worklightServerRootURL>http://${local.IPAddress}:8080</worklightServerRootURL>
31  -->

```

- __i. Environment specific information will be inserted automatically as new 'environments' are added to the project. You can observe this change as environments are added during later portions of the lab.

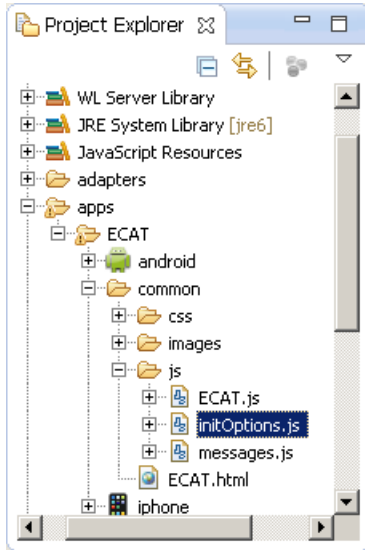
```

34  <android version="1.0">
35     Uncomment and update push sender ID in order to use push notifications for android
36     <pushSender key="keyTest" senderId="senderIdTest" />
37  </android>
38  -->

```

- __2. Add logic to connect to, and handle a connection failure with the Worklight server

- __a. Expand the **common** then **js** folder, and **double-click** to open the **initOptions.js** file.



This file contains the parameters needed to connect to the Worklight server. These will be invoked automatically once the Worklight framework initialization completes on the client side. Here we will change the parameters to

- a) Enable the mobile application to connect with the Worklight server
- b) Instructions if unable to connect to the server.

Copy and Paste the following code into the **initOptions.js** file over-writing the code shown in the red rectangle in the image below.

```
connectOnStartup : true,

    // # The callback function to invoke in case application fails to connect to
    Worklight Server
    onConnectionFailure: function (){
        alert("Worklight server unavailable, running in disconnected
mode.");
        wlCommonInit();
    }
}
```

Copy and Paste code from above or **Snippet#1.txt** from the accompanying Lab Snippets folder on the desktop for cut & paste.

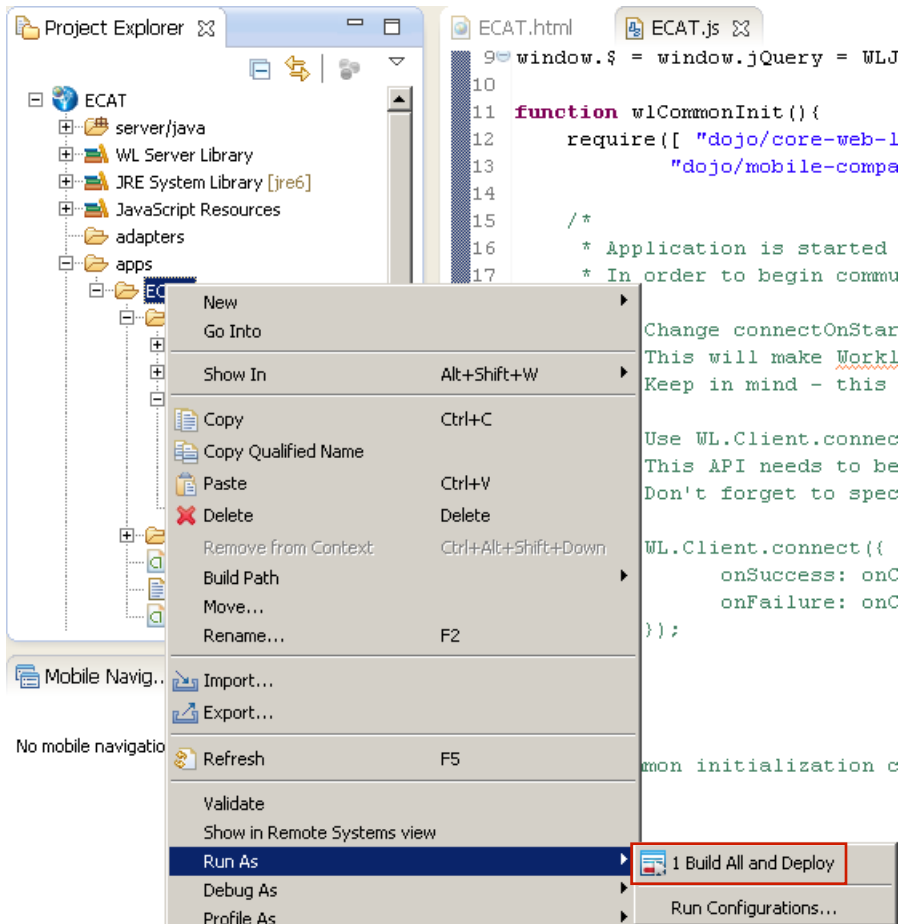
Below is a screenshot of what the result will look like after your changes.

```
1 /*
2  * Licensed Materials - Property of IBM
3  * 5725-G92 (C) Copyright IBM Corp. 2006, 2012. All Rights Reserved.
4  * US Government Users Restricted Rights - Use, duplication or
5  * disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
6  */
7
8 // Uncomment the initialization options as required. For advanced initialization options please refer
9
10 var wlInitOptions = {
11
12     // # Should application automatically attempt to connect to Worklight Server on application start
13     // # The default value is true, we are overriding it to false here.
14     connectOnStartup : true,
15
16     // # The callback function to invoke in case application fails to connect to Worklight Server
17     onConnectionFailure: function () {
18         alert("Worklight server unavailable, running in disconnected mode.");
19         wlCommonInit();
20     }
21
22     // # Worklight server connection timeout
23     //timeout: 30000,
24
25     // # How often heartbeat request will be sent to Worklight Server
26     //heartbeatIntervalInSecs: 20 * 60,
```

__b. **Save** the initOptions.js file

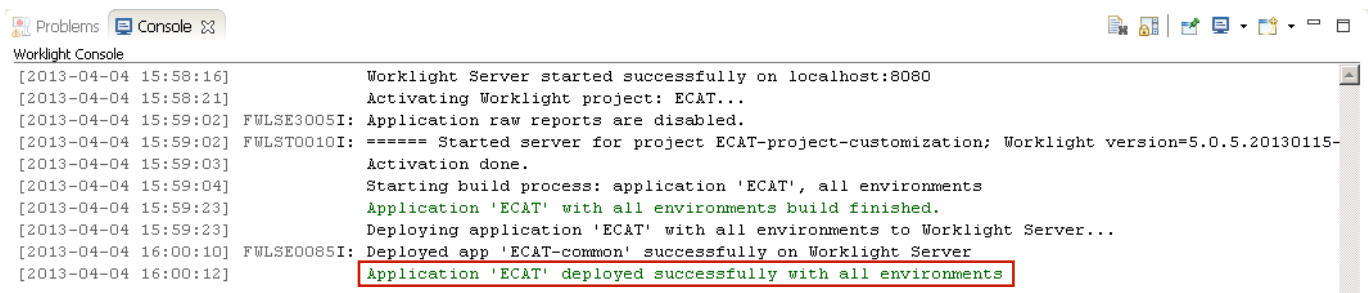
__2. Perform a build of the work that you have completed so far.

__a. Right-click the **ECAT** application and select **Run As > Build All and Deploy**.



The Build and Deploy step will publish your application to an embedded test server within eclipse, where we can preview and test as part of the development life-cycle.

- b. Verify that the build process and that the deployment to Worklight server was successful by examining the log output in the Console view.

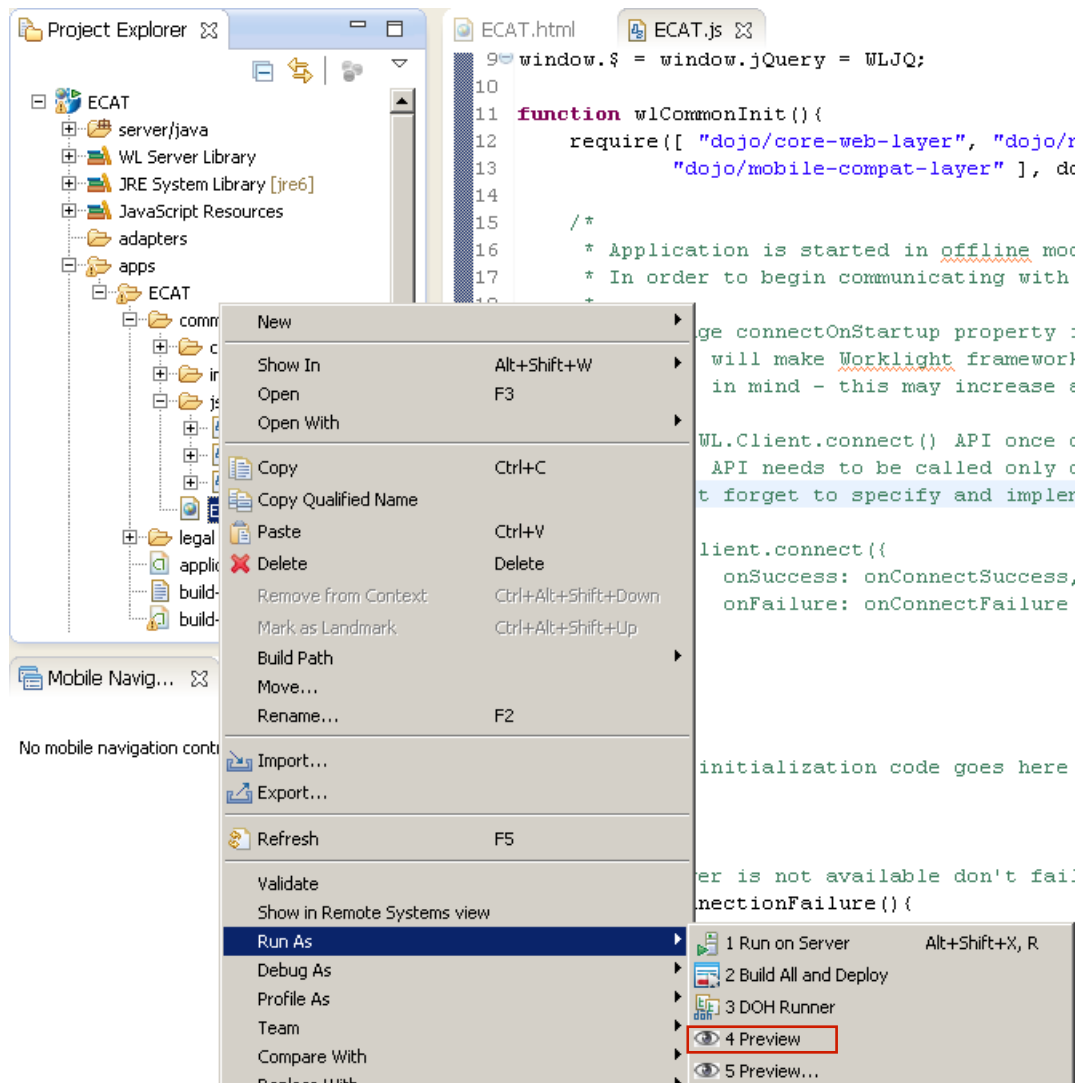


If the console is not displayed, open it with **Window > Show view > Other > Console**.

Use Window > Use the console icon () to switch between the various consoles if necessary, until you find the **Worklight Console**.

1.3 Preview common resources in Mobile Browser Simulator

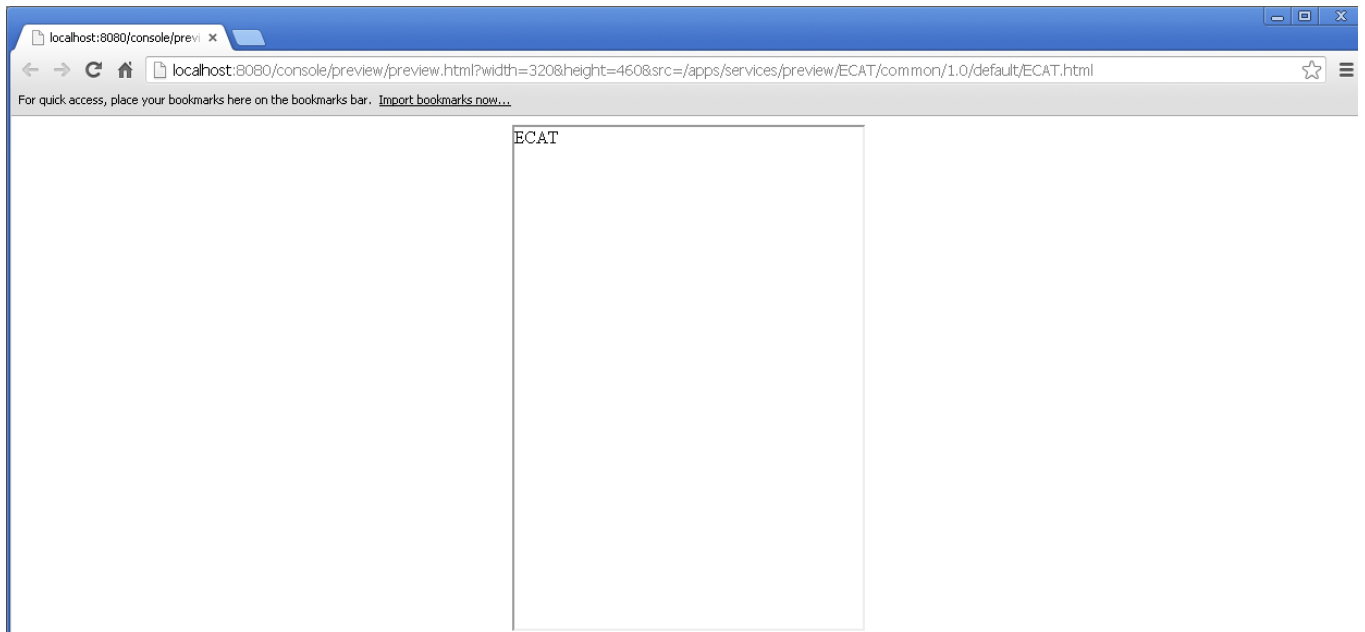
1. Right-click on either the **common** folder (to run the common resource web app) or the **ECAT.html** file within the common folder and select **Run as > Preview** (use the first preview option in the menu)



2. A new external browser window will open with the **Mobile Browser Simulator** rendering our ECAT application.

For this lab, we have configured eclipse to use an external web browser (Chrome), which opens the Mobile Browser Simulator in a browser window outside of eclipse. Using an external browser gives freedom to choose your rendering browser, access to advanced debugging features like Web Inspector in Chrome or Firebug with Firefox, and access to internet settings, cache and history that are not available when running with the internal browser setting in eclipse (see Window > Preferences > General > Web Browser for this setting).

As this application has no device characteristics yet, a simple, un-styled mobile browser view is rendered, with no device configuration options.



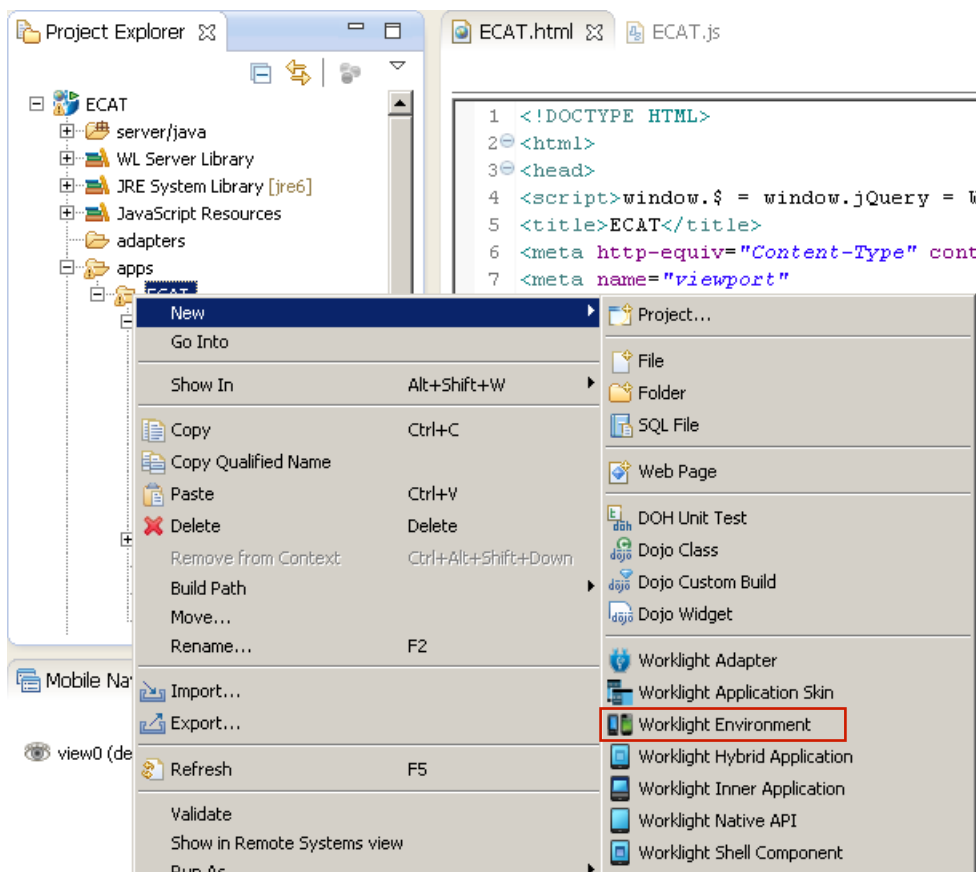
Congratulations! You are previewing your first hello world-like application developed using Worklight.

1.4 Exploring Worklight Environments

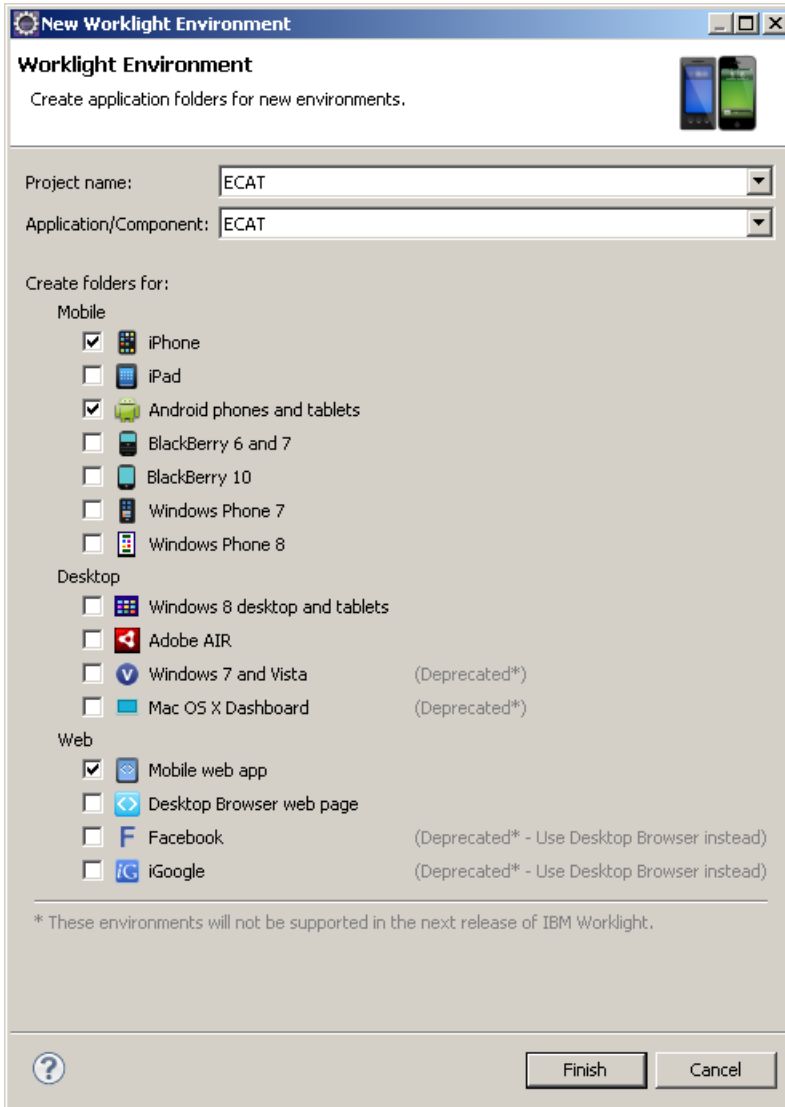
An environment is a mobile, desktop, or web platform capable of displaying web-based applications, such as the Apple iPhone, Android phones, Windows 7, and BlackBerry. In this section you will create environments to provide support for iPhone, Android and Mobile Web.

__1. Creating the Worklight Environments for the ECAT application

- __a. In the *Project Explorer* select the **ECAT** application (in the /apps/ECAT folder). In the right click menu select **New > Worklight Environment**.

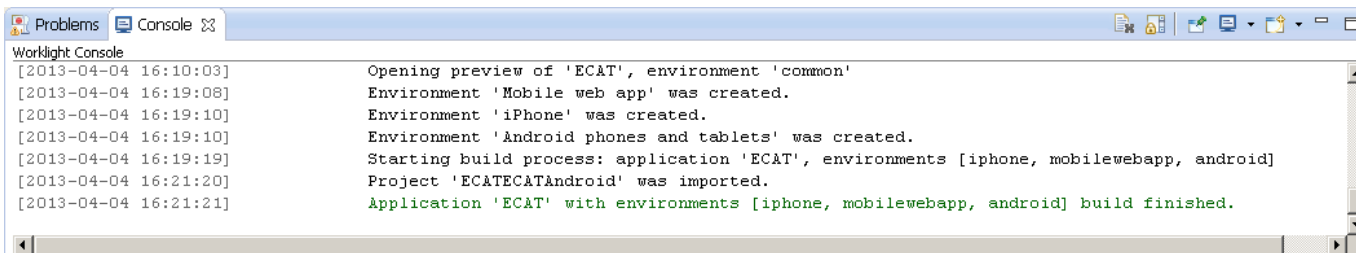


- __b. In the *Worklight Environment* dialog, select **iPhone, Android phones and tablets**, and **Mobile web app**, (as seen below) then click **Finish**.

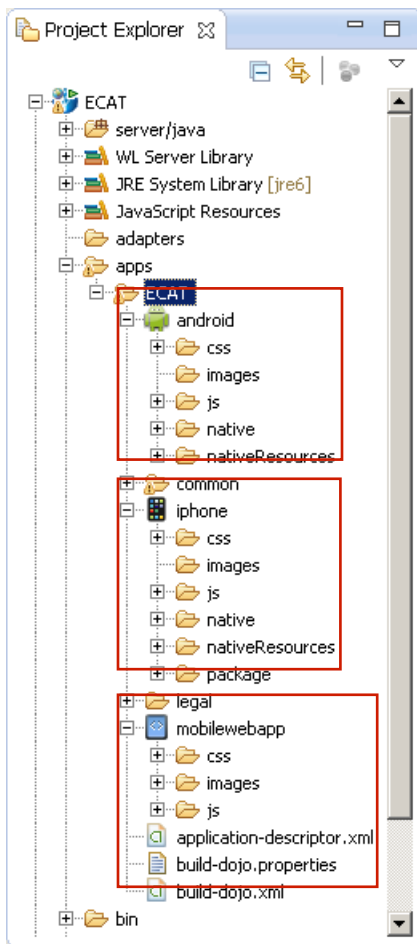


Note: In previous versions of the VMware image, we have seen an assertion failure here. If you see this, please re-try.

- ___c. Observe the *Console* window, notice that the messages about the environments that you have just chosen.



- __d. In the **Project Explorer**, observe that there are now additional folders created under the **ECAT** application folder.

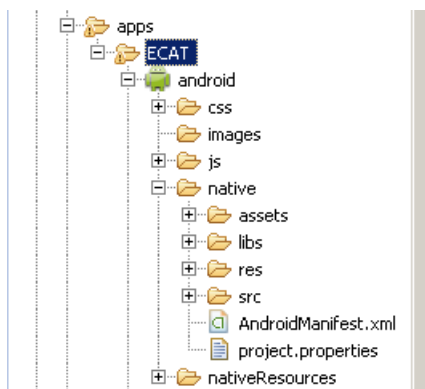


The new environment's resources will have the following relationship with the common resources:

- **images** - override the common images in case both share the same name
- **css** – extend and/or override the common CSS files
- **js** - extends the common application instance JS object (The environment class extends the common app class)
- **HTML** - override the common HTML code in case both share the same name
- **native**: contains environment specific generated application code

- __2. Quick review of the native folder for specific environments

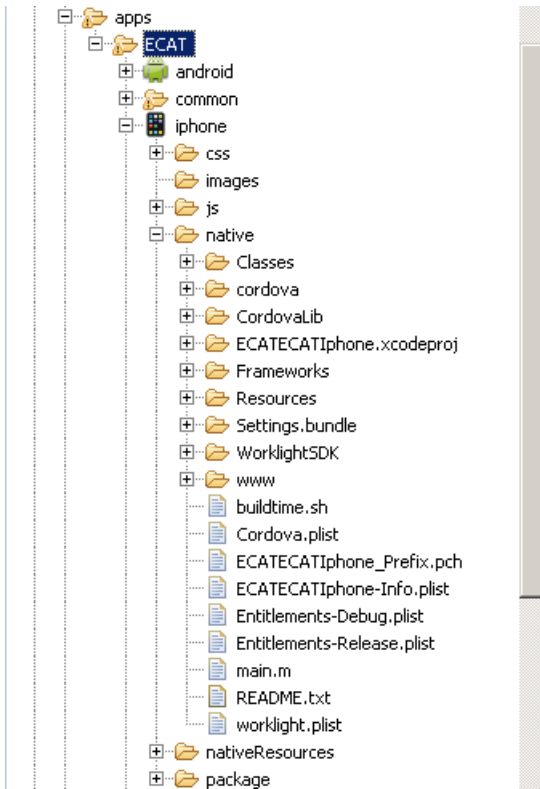
- __a. Android native folder



The **native** folder under android contains automatically generated android application code that is imported into the eclipse workspace as an Android Project during the Build and Deploy step (later).

It is not recommended to edit files under the assets folder, as each time the application is built they are regenerated.

__b. iPhone folders



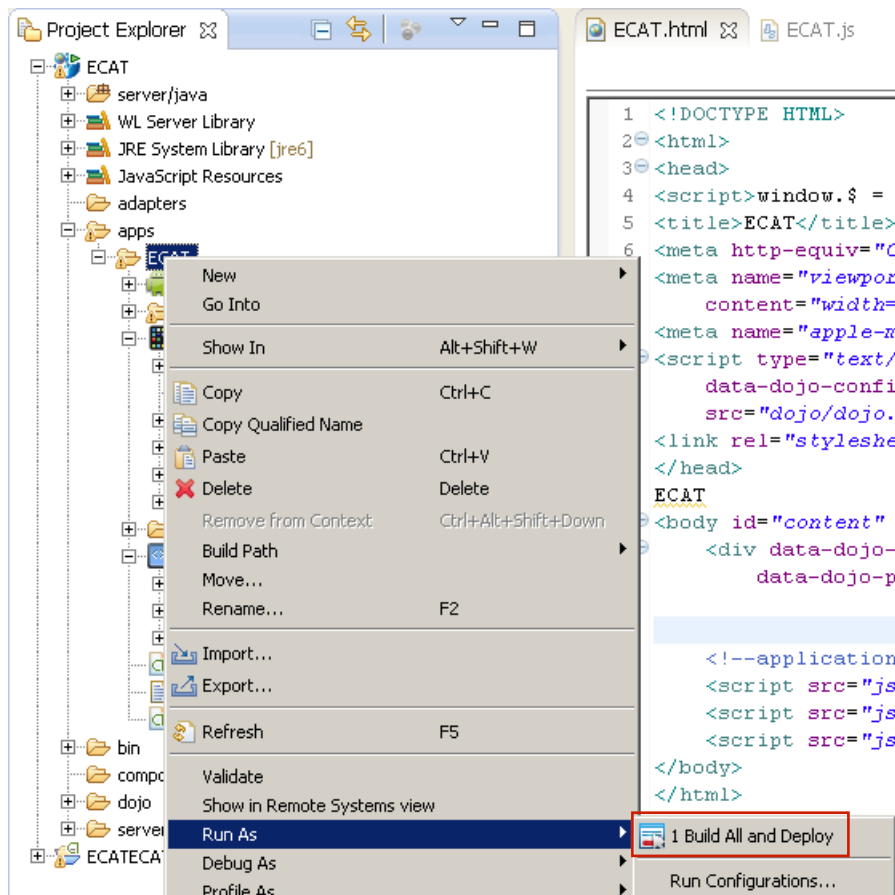
The **native** folder under iphone contains automatically generated iphone app code

The **package** folder under iphone contains a packaged (zipped) application

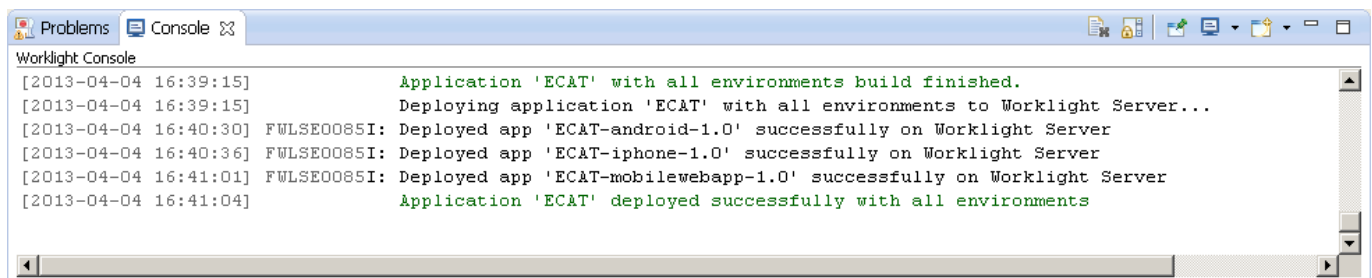
It is not recommended to edit files under native/www folder, as each time the application is built they are regenerated

__3. Build and deploy all environments

__a. Right-click the **ECAT** application and select **Run As > Build All and Deploy**.

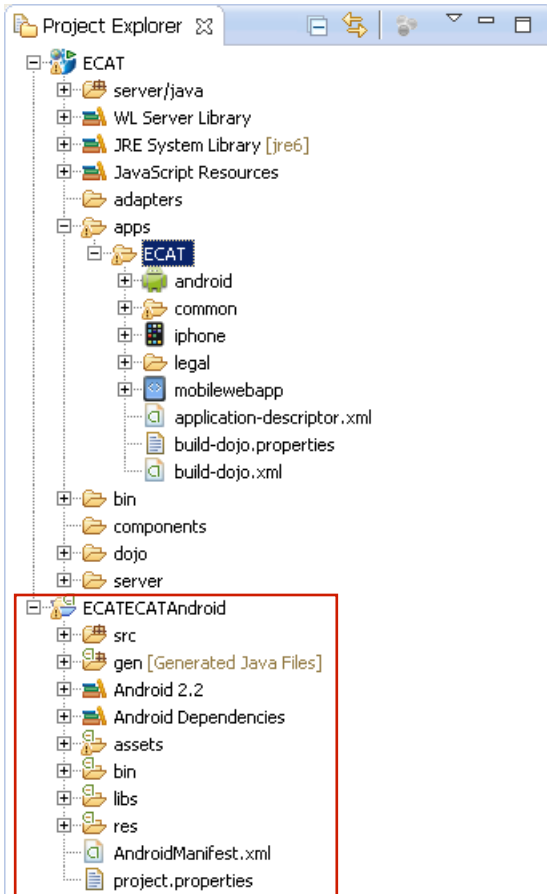


__b. Check the Console log to make sure that the build and deploy is successful.



__c. Observe that the Native Android project has been created and imported into Eclipse workspace.

This is an example of IBM Worklight's tight integration with the device SDKs. Because the Android SDK is Eclipse-enabled, Worklight is able to immediately generate an Android Project in the Eclipse workspace (same for BlackBerry). For other platforms, Worklight will launch the respective non-Eclipse tooling and provide a project in that tool's format for completion (eg. Xcode).

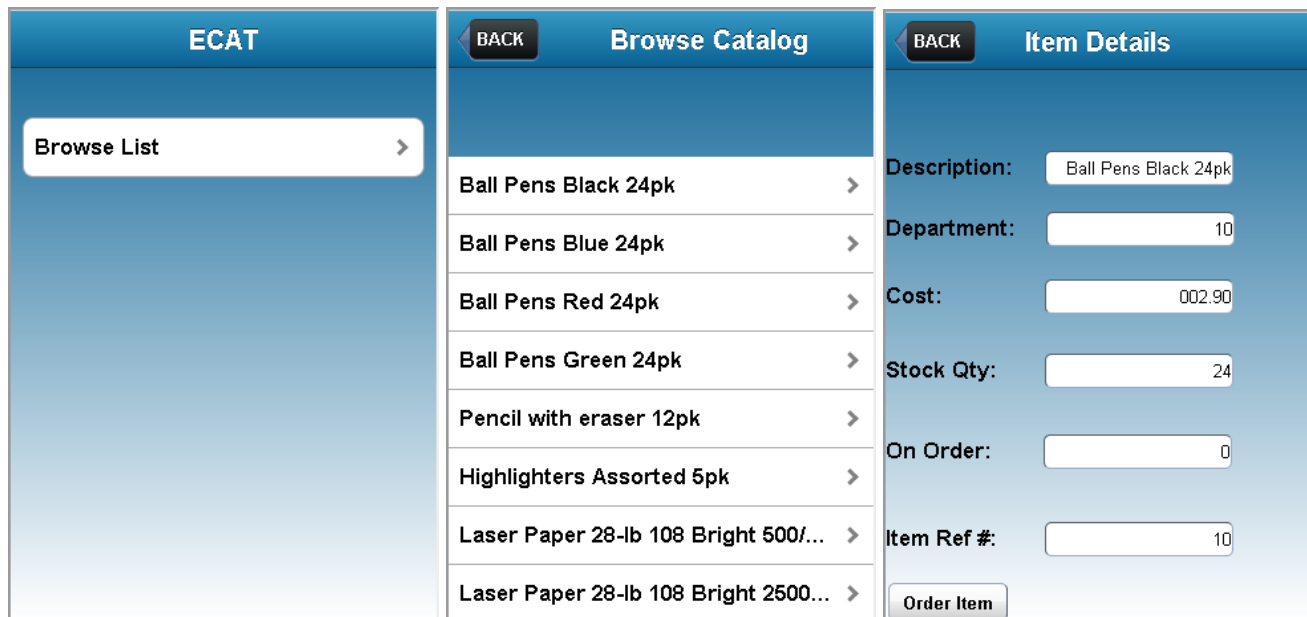


We will add some more interesting content in the next section before previewing the environment-specific variations of the application.

1.5 Enhancing the ECAT application with visual content

In this part of the Lab, we are going to continue developing our ECAT application with the new Rich Page Editor, added in Worklight v5.0.

- __1. Review the content you will build - three ECAT application views
- __a. The Main View, Browse List View, and the Item Details View of the ECAT application that will be built in this lab are shown below:



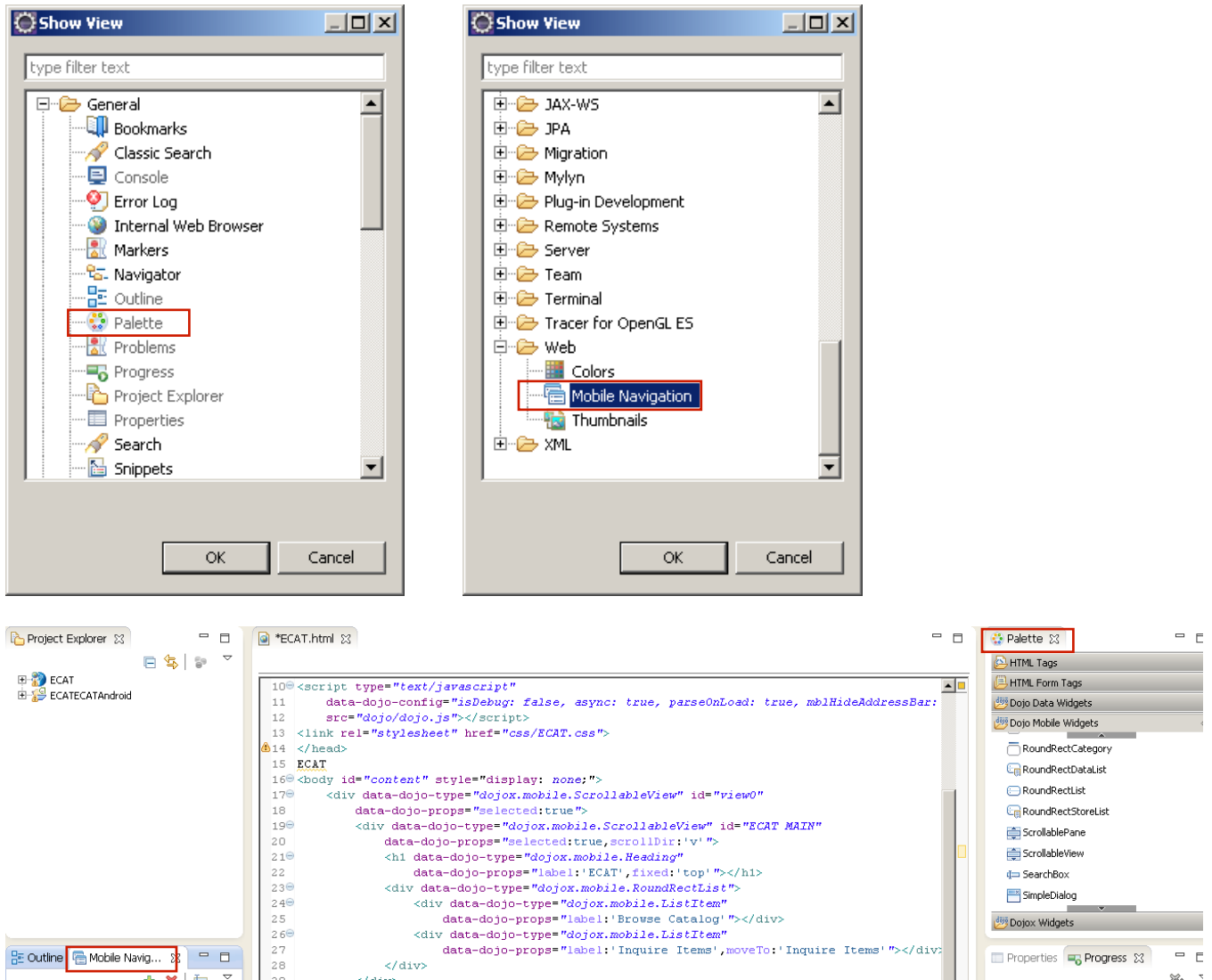
The Main view consists of a `dojox.mobile.ScrollableView`, with a Header, and a feature button (Browse Catalog).

The Browse List view is also built on a `dojox.mobile.ScrollableView`, and contains a Header, a navigation button to return to the Main view, and a scrollable listing of the items in the catalog. When one of the items in the list are selected, you are directed to the Item Details View.

When an item is selected via the Browse List View or the Inquire Items View, you are directed to the Item Details View. This view is also a `dojox.mobile.ScrollableView`, with the item details listed. This view also has six `dojox.mobile.TextBox(s)` and an 'Order Items' Button. When the items quantity is selected and the 'Order Items' button is tapped, that item and its quantity is ordered.

- __2. Prepare Eclipse for Rich Page Editor development by opening the appropriate eclipse Views.

Ensure that you have both the **Palette** and **Mobile Navigation** tabs visible for use with the Rich Page Editor. We will use Mobile Navigation to manipulate and navigate between the ScrollableViews in ECAT.html, and the Palette will allow us to drag visual elements onto the page.

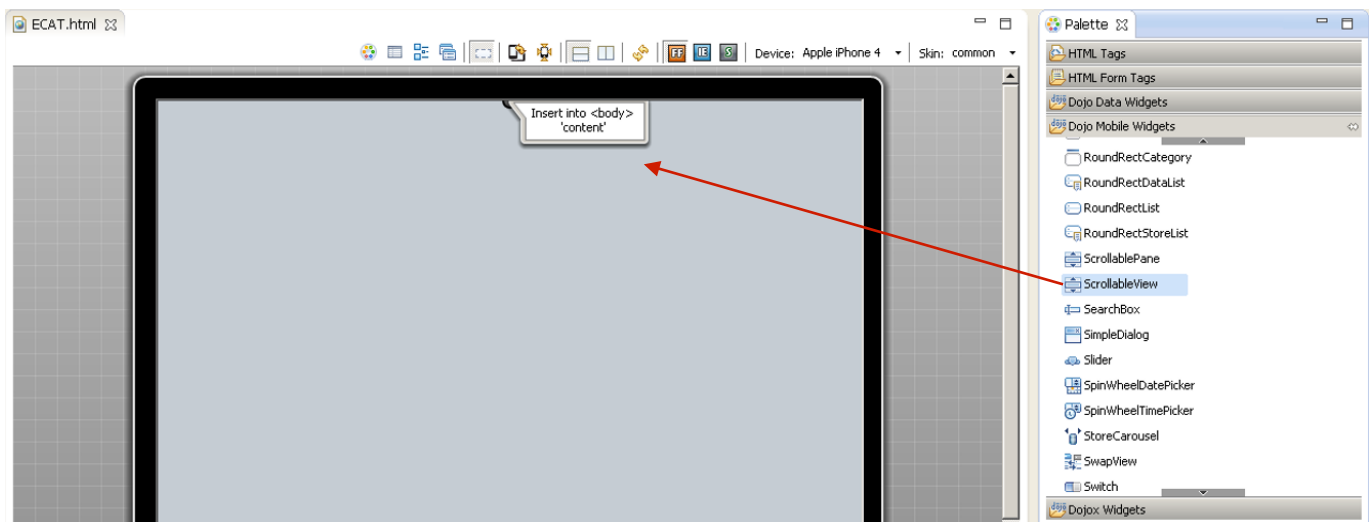
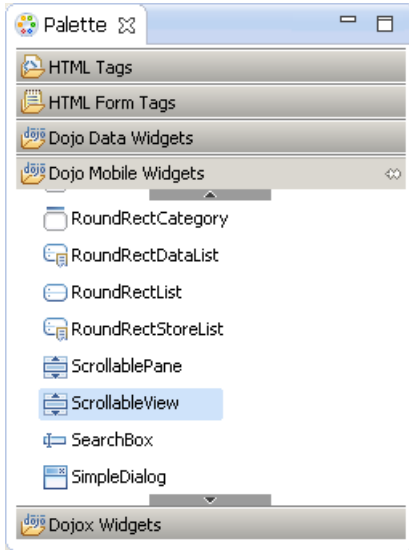


(You can place the tabs in whichever way seems most efficient to you)

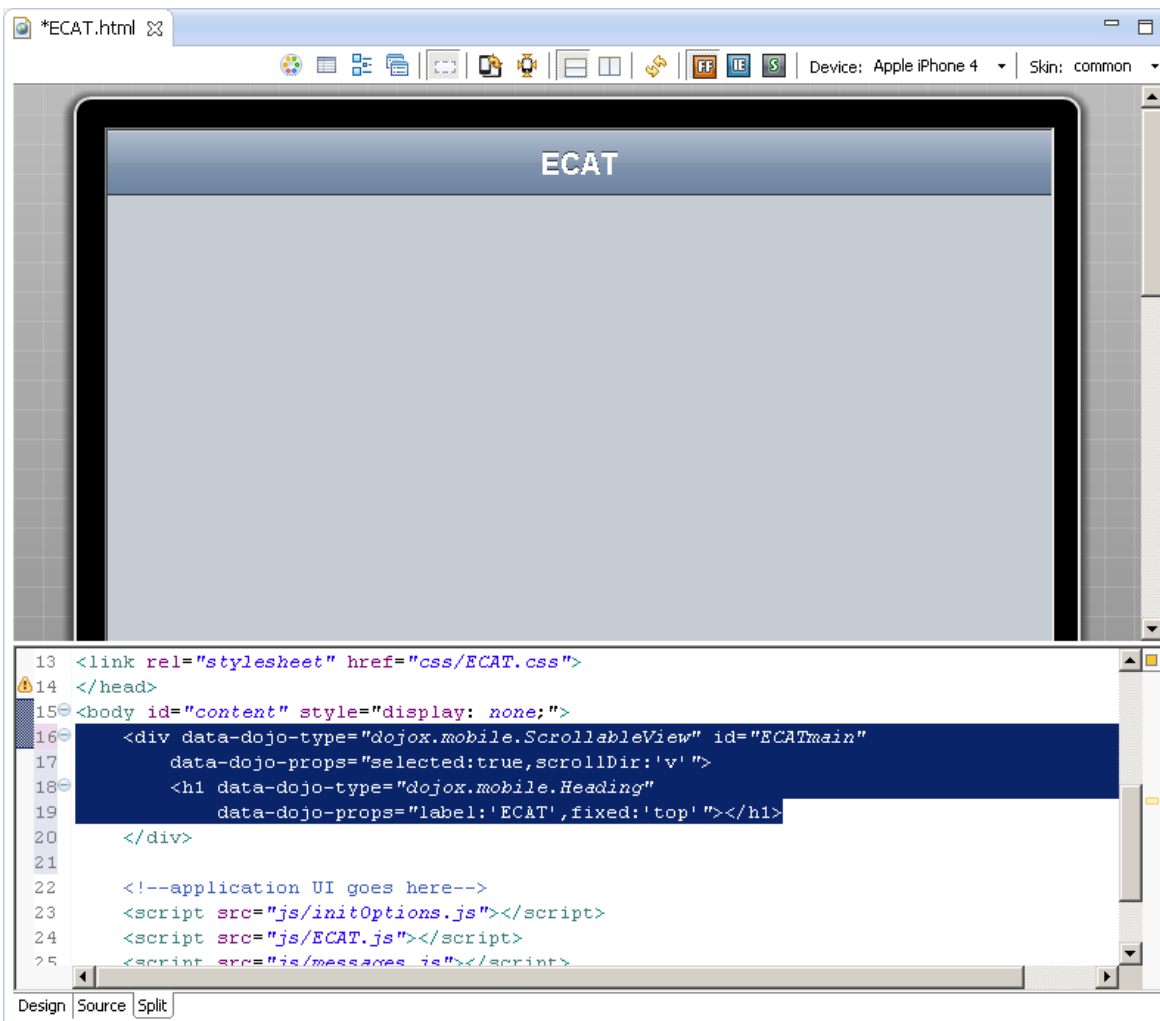
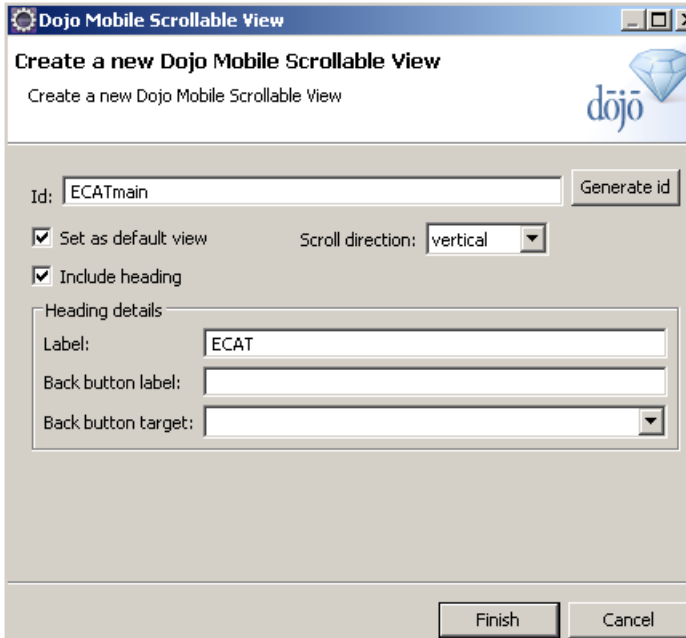
- __3. Open the file ECAT.html into the editor if it's not already opened.
- __4. Add a ScrollableView to the ECAT.html page.

“Pages” in a mobile application are built on views. For this application we are using `dojo.mobile.ScrollableViews`, which are dojo view widgets that manage a view pane. Ensure that the ECAT.html file is the active file in the editor pane, and that the design or split editor tab is visible.

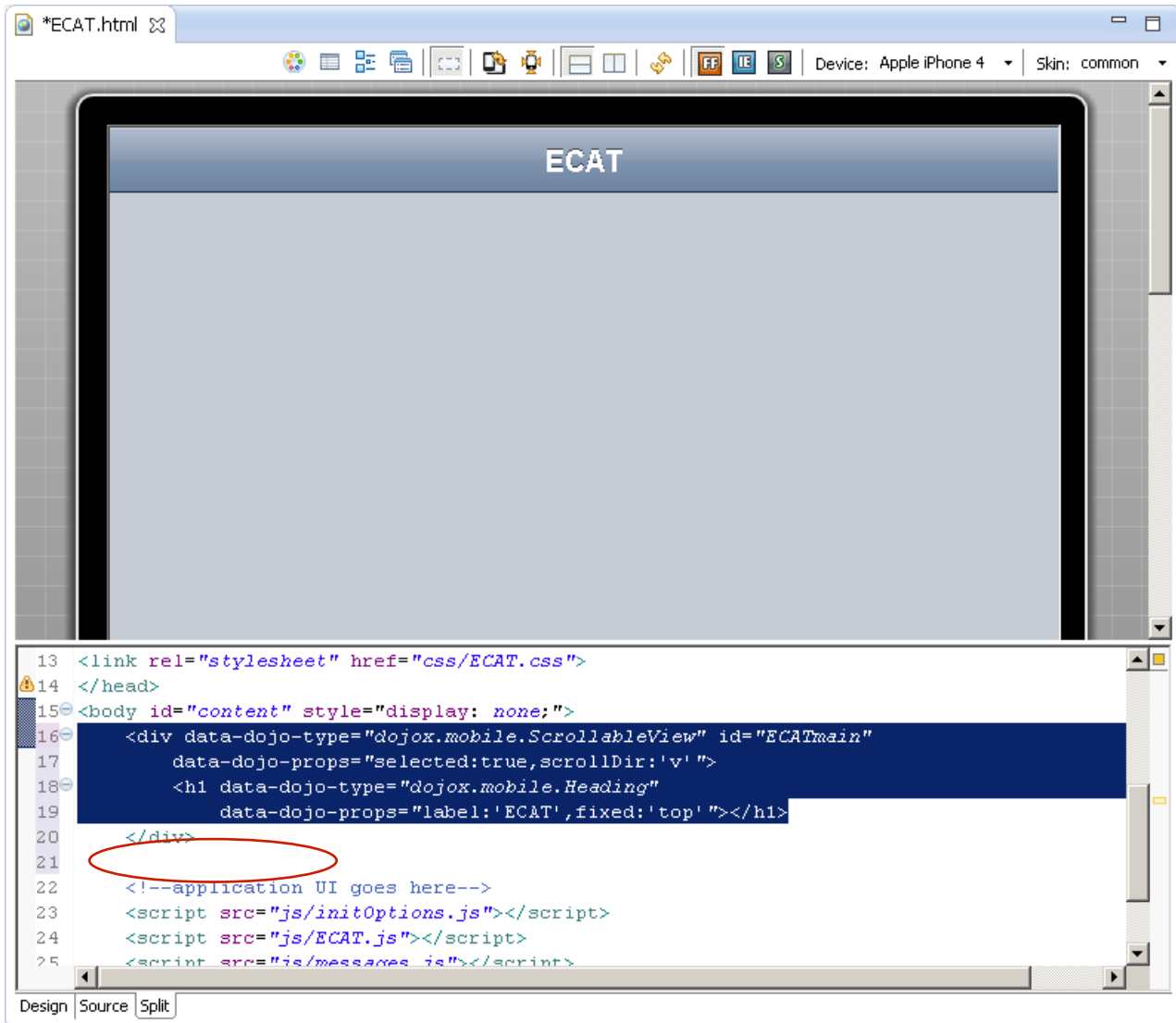
Drag the **ScrollableView** widget from the **Dojo Mobile Widgets** section of the palette into the design tab of the editor, in the `<body>` section of the ECAT.html file.



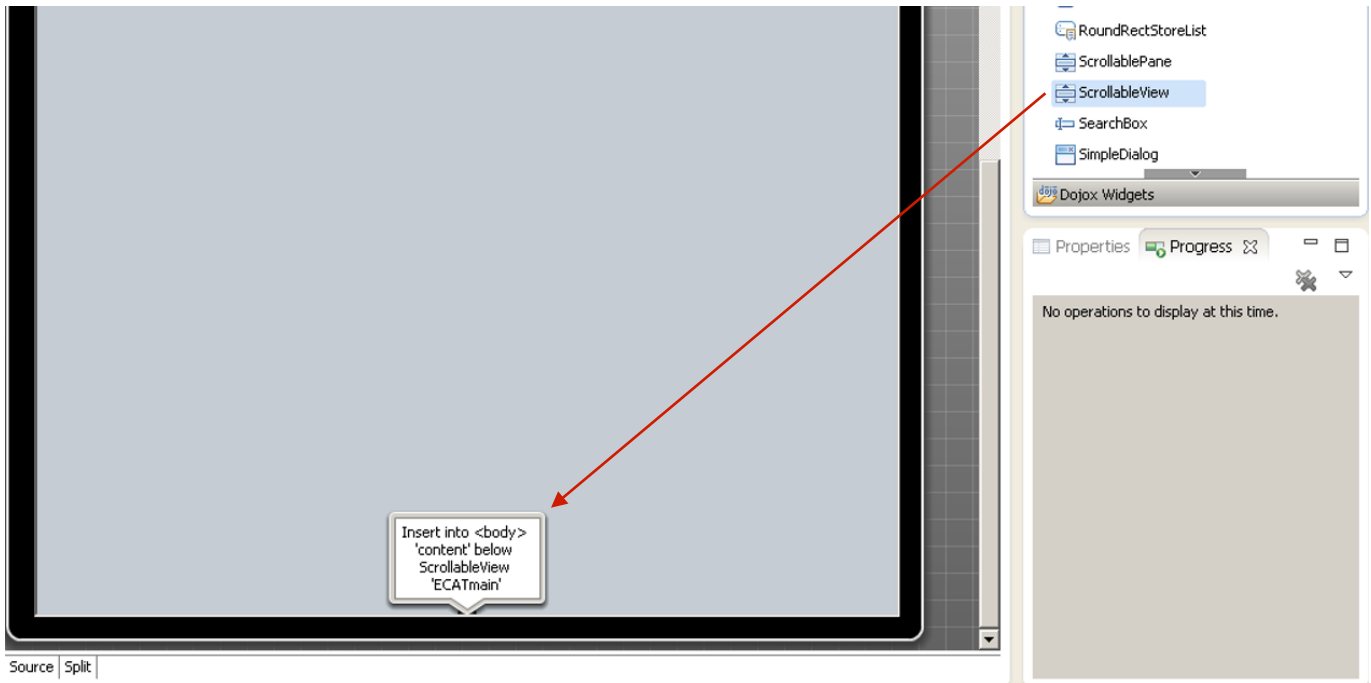
- ___5. Complete the 'Create a new Dojo Mobile Scrollable View' panel as follows.
- ___a. Edit the Id field and change the default name of "view0" to "ECATmain".
 - ___b. Check **Set as default view** checkbox.
 - ___c. Select the **Include heading** checkbox.
 - ___d. Enter ECAT as the heading **label**.
 - ___e. Click **Finish** to complete the ScrollableView. If you have the Split tab open in the editor, you can see both the visual content and the source being added to your application



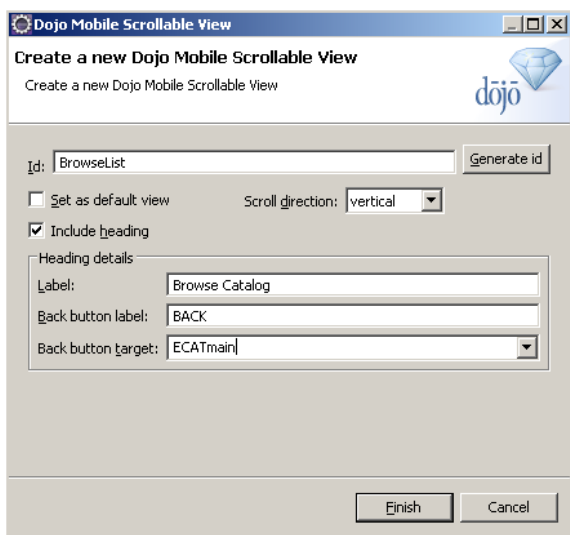
- ___6. Remove the default "ECAT" text that now sits below the ScrollableView <div> by deleting it from the source pane in the Rich Page Editor pane.



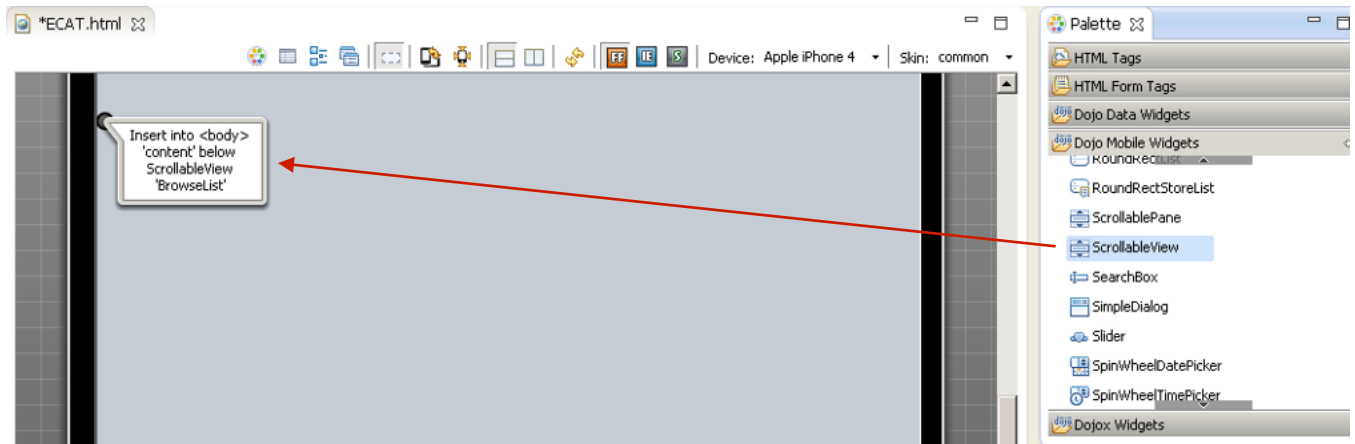
- ___7. Next we'll add a second dojox.mobile.ScrollableView to our application by dragging another ScrollableView widget from the Dojo Mobile Widgets section of the Pallet into the <body> of our ECAT.html page, **after** the ECATmain ScrollableView as follows:



- __8. After dragging and dropping, the ‘Create a new Dojo Mobile Scrollable View” dialog will surface.
 - __a. Enter `BrowseList` as the **Id**.
 - __b. Select the **Include heading** checkbox to include a heading.
 - __c. Enter `Browse Catalog` as the **Heading label**.
 - __d. Enter `BACK` as the **Back button label** to add a Back button label.
 - __e. Select **ECATmain** from the **Back button target** drop-down box.
 - __f. Click **Finish** to generate the ScrollableView code for our Browse List view.



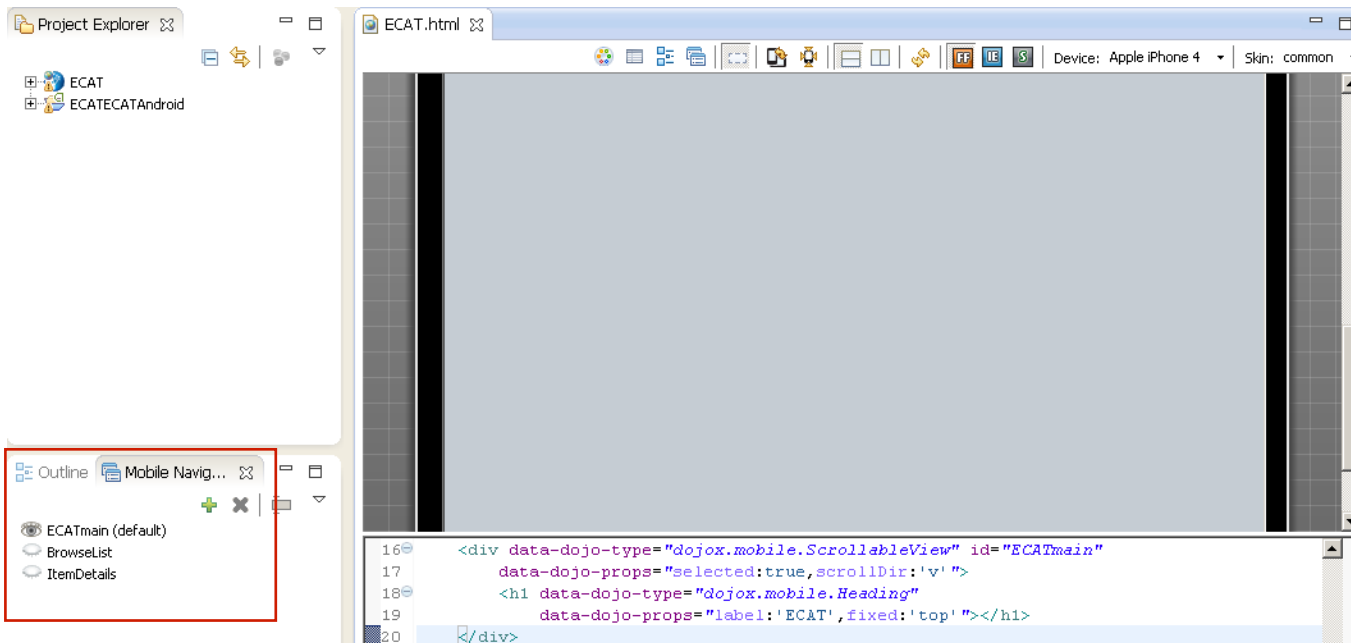
- __9. Lastly we'll add a third `dojox.mobile.ScrollableView` to our application by dragging another `ScrollableView` widget from the Dojo Mobile Widgets section of the Palette into the `<body>` of our `ECAT.html` page, **after** the `BrowseList` `ScrollableView` as follows:



- __10. After dragging and dropping, the ‘Create a new Dojo Mobile Scrollable View’ dialog will surface.
- __a. Enter `ItemDetails` as the **Id**.
 - __b. Select the **Include heading** checkbox to include a heading.
 - __c. Enter `Item Details` as the **Heading label**.
 - __d. Enter `BACK` as the **Back button label** to add a Back button label.
 - __e. Select **BrowseList** from the **Back button target** drop-down box.
 - __f. Click **Finish** to generate the `ScrollableView` code for our Item Details view.

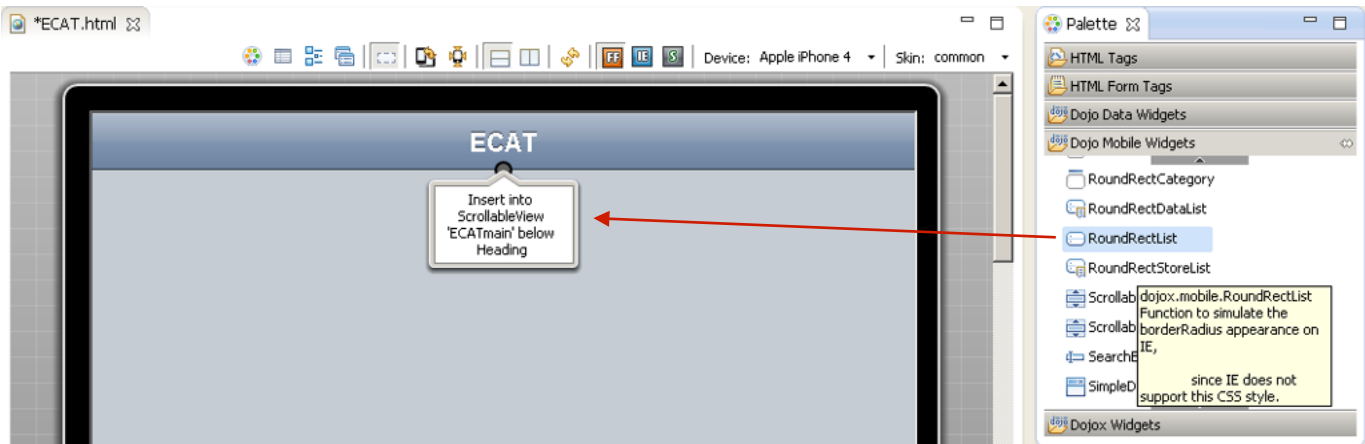
- __11. Open the Mobile Navigation tab and notice how you can alternate the contents of the design tab in the Rich Page Editor by selecting which is the active Mobile View – the view with the open eye icon is currently displayed in the design tab. Click the closed eyelid to make that Mobile View become the visible view in the editor.

If you select the eyelid for the ECATmain, ECATmain is selected in the Mobile Navigation tab and rendered in the design tab. This goes for any of the three views we created.

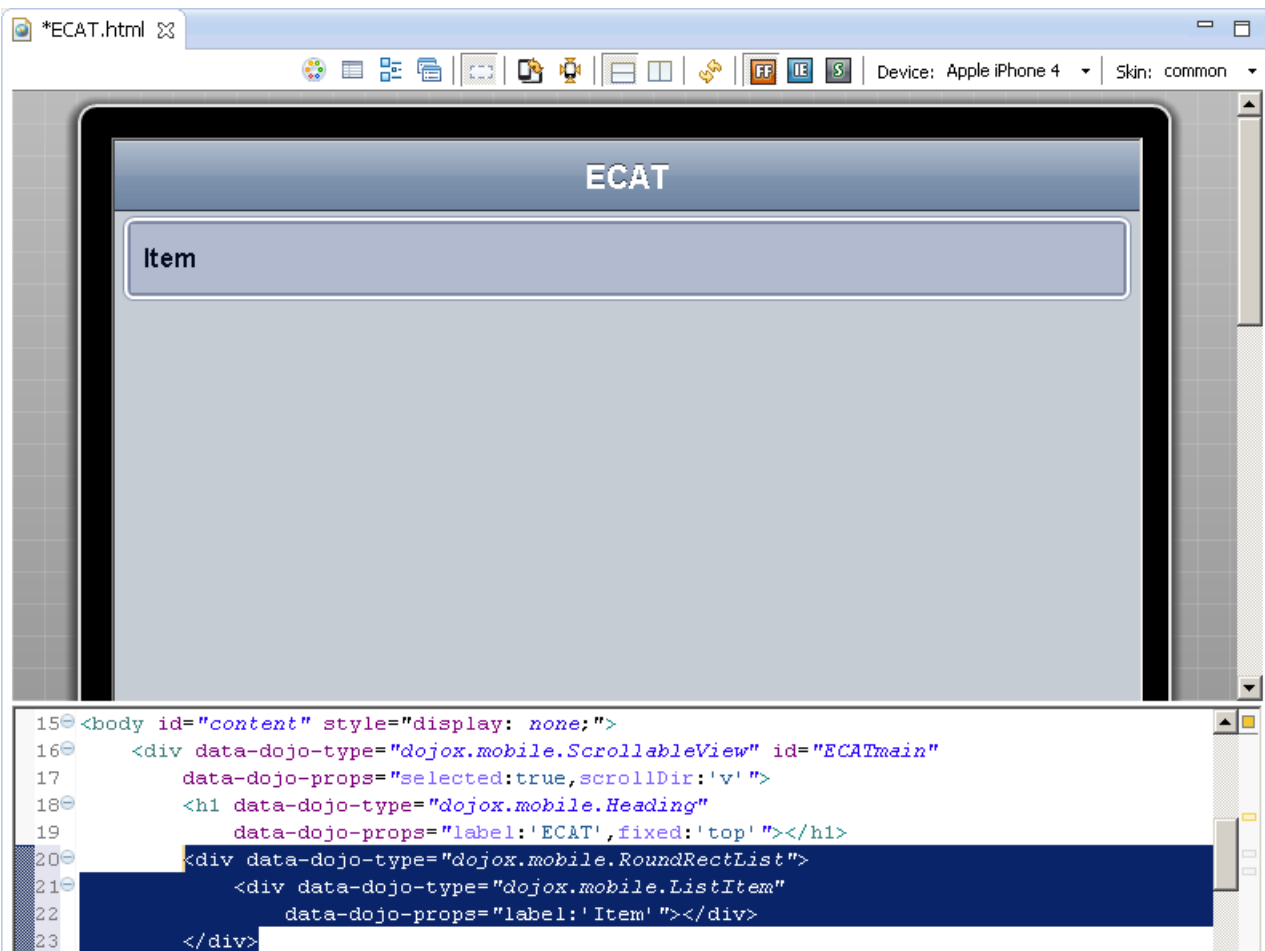


Congratulations, we have now designed our application's three views. We now want to create the content of those views.

- __12. From the Mobile Navigation Tab above, we want to make sure that the ECATmain (default) view is selected. To select this view (if not already opened), click the closed eye icon beside the ECATmain view.
- __a. On the ECATmain view, we want to add a `dojo.mobile.RoundRectList`, which will house a `dojo.Mobile.ListItem`, (Browse List). When this list item is tapped, we are taken to the BrowseList view.
 - __i. Drag and drop a `dojo.mobile.RoundRectList` from the Dojo Mobile Widgets section of the Pallet into the 'ECATmain' ScrollableView **below** Heading (as seen below).



You now see that a `dojox.mobile.RoundRectList` has been added with a `dojox.mobile.ListItem` already created. We now want to customize the `dojox.mobile.ListItem` to correspond to the Browse List view.



- ii. We will now make a slight change to the `dojox.mobile.ListItem` in the source view. **Copy and paste** the following line to add an on-click property to the `dojox.mobile.ListItem` element, which will take us to the next view.

```
<div data-dojo-type="dojox.mobile.ListItem" data-dojo-props="label:'Browse List',moveTo:'BrowseList'" onclick="inquireCatalog"></div>
```

This change is reflected below with before and after code.

This is the code before the change:

```
20 <div data-dojo-type="dojox.mobile.RoundRectList">
21 <div data-dojo-type="dojox.mobile.ListItem"
22 data-dojo-props="label:'Browse List',moveTo:'BrowseList'"></div>
23 </div>
```

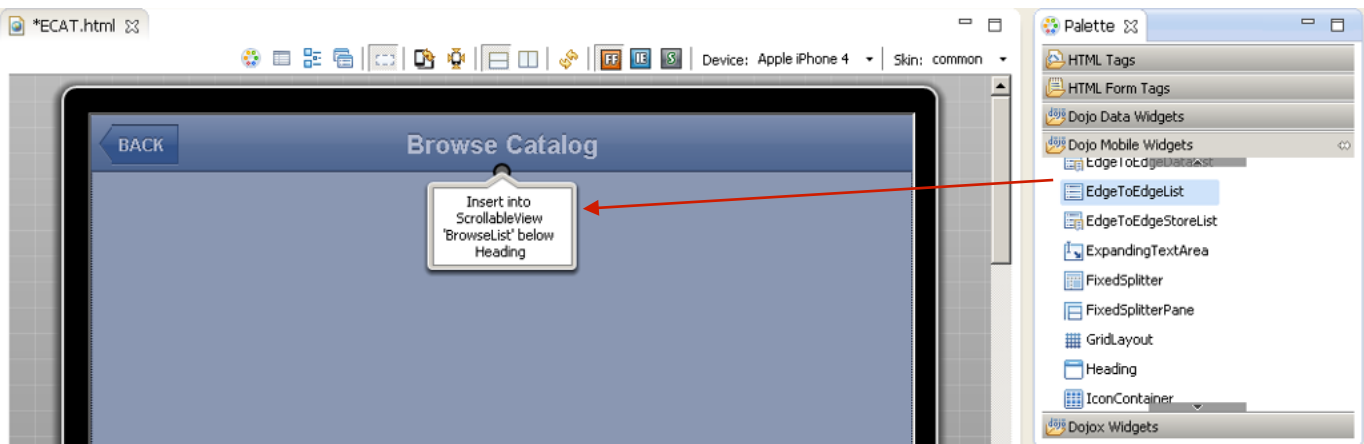
This is the code after the change:

```
20 <div data-dojo-type="dojox.mobile.RoundRectList">
21 <div data-dojo-type="dojox.mobile.ListItem" data-dojo-props="label:'Browse List',moveTo:'BrowseList',onClick:'inquireCatalog'"></div>
22 </div>
```

- ___iii. Make sure to **save your changes** to the ECAT.html.

You have now designed the ECATmain view, added a list item that is now linked to the BrowseList view. We will now design the BrowseList view.

- ___15. From the Mobile Navigation Tab, we want to make sure that the **BrowseList view** is selected. To select this view (if not already opened), click the closed eye icon beside the **BrowseList** view.
 - ___a. On the BrowseList view, we want to add a **dojox.mobile.EdgeToEdgeList**, which will house all of the items in the catalog that we want to list. When one of these list items are tapped, we are taken to the corresponding item's **ItemDetails** view.
 - ___i. Drag and drop a **dojox.mobile.EdgeToEdgeList** from the Dojo Mobile Widgets section of the Palette into the 'BrowseList' ScrollableView **below** Heading (as seen below).



- __ii. We will now make a slight change to the **dojox.mobile.EdgeToEdgeList** in the source view. **Delete** the **dojox.mobile.ListItem** completely, from `</div>` to `<div>` as shown in the red rectangle below.
- __iii. Also **copy and paste** the following line to add an ID property to the **dojox.mobile.EdgeToEdgeList** element.

```
<div data-dojo-type="dojox.mobile.EdgeToEdgeList" id="catalogList">
```

Both of these changes are reflected below.

The first image is the before:

```
27 <h1 data-dojo-type="dojox.mobile.Heading"
28     data-dojo-props="label:'Browse Catalog',back:'BACK',moveTo:'EC&Tmain',fixed:'tc
29 <div data-dojo-type="dojox.mobile.EdgeToEdgeList">
30     <div data-dojo-type="dojox.mobile.ListItem"
31         data-dojo-props="label:'Item',moveTo:'ItemDetails'"></div>
32     </div>
33 </div>
```

This image is the after:

```
27 <h1 data-dojo-type="dojox.mobile.Heading"
28     data-dojo-props="label:'Browse Catalog',back:'BACK',moveTo:'EC&Tmain',fixed:'tc
29 <div data-dojo-type="dojox.mobile.EdgeToEdgeList" id="catalogList">
30 </div>
31 </div>
```

- __iv. Make sure to **save your changes** to the ECAT.html.

This change allows the `dojox.mobile.EdgeToEdgeList` to be populated with a number of list items dynamically, which we will get to in later steps.

You have now designed the BrowseList view, added a `dojox.mobile.EdgeToEdgeList` which will be linked to the ItemDetails view. We will now design the ItemDetails view.

- __16. From the Mobile Navigation Tab, we want to make sure that the **ItemDetails view** is selected. To select this view (if not already opened), click the closed eye icon beside the **ItemsDetails** view.

The ItemDetails view will consist of six textboxes and a button (Order Item). The six textboxes have some description text, and are where the data for each catalog item will go once it is retrieved from the VSAM dataset on our back-end enterprise system.

Due to time constraints, the design of this view has already been completed, and will require a copy and paste of the code below, or a copy and paste of the code from the **Snippet#2.txt** file found in the Lab Snippets folder located on the desktop.

You will want to make sure that the code snippet (Snippet#2.txt) is copied in its entirety, and pasted directly after the heading for the ItemDetails view as shown below (the red rectangle surrounds the heading):

```

3 </head>
4 <script>window.$ = window.jQuery = WLJQ;</script>
5 <title>ECAT</title>
6 <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
7 <meta name="viewport"
8     content="width=device-width, initial-scale=1, maximum-scale=1, user-scalable=no">
9 <meta name="apple-mobile-web-app-capable" content="yes">
10 <script type="text/javascript"
11     data-dojo-config="isDebug: false, async: true, parseOnLoad: true, mblHideAddressBar: false"
12     src="dojo/dojo.js"></script>
13 <link rel="stylesheet" href="css/ECAT.css">
14 </head>
15 <body id="content" style="display: none;">
16     <div data-dojo-type="dojox.mobile.ScrollableView" id="ECATmain"
17         data-dojo-props="selected:true,scrollDir:'v' ">
18         <h1 data-dojo-type="dojox.mobile.Heading"
19             data-dojo-props="label:'ECAT',fixed:'top' "></h1>
20         <div data-dojo-type="dojox.mobile.RoundRectList">
21             <div data-dojo-type="dojox.mobile.ListItem"
22                 data-dojo-props="label:'Browse List',moveTo:'BrowseList' "></div>
23         </div>
24     </div>
25     <div data-dojo-type="dojox.mobile.ScrollableView" id="BrowseList"
26         data-dojo-props="selected:false,scrollDir:'v' ">
27         <h1 data-dojo-type="dojox.mobile.Heading"
28             data-dojo-props="label:'Browse Catalog',back:'BACK',moveTo:'ECATmain',fixed:'top' "></h1>
29         <div data-dojo-type="dojox.mobile.EdgeToEdgeList">
30             <div data-dojo-type="dojox.mobile.ListItem"
31                 data-dojo-props="label:'Item',moveTo:'ItemDetails' "></div>
32         </div>
33     </div>
34     <div data-dojo-type="dojox.mobile.ScrollableView" id="ItemDetails"
35         data-dojo-props="selected:false,scrollDir:'v' ">
36         <h1 data-dojo-type="dojox.mobile.Heading"
37             data-dojo-props="label:'Item Details',back:'BACK',moveTo:'ECATmain',fixed:'top' "></h1>

```

Set your cursor directly after the `</h1>` tag and **hit the Enter key**. This will start a new line in the editor. Line your cursor up with the preceding `<h1` tag as shown below.

```

36 <h1 data-dojo-type="dojox.mobile.Heading"
37     data-dojo-props="label:'Item Details',back:'BACK',moveTo:'ECATmain',fixed:'top' "></h1>
38 |

```

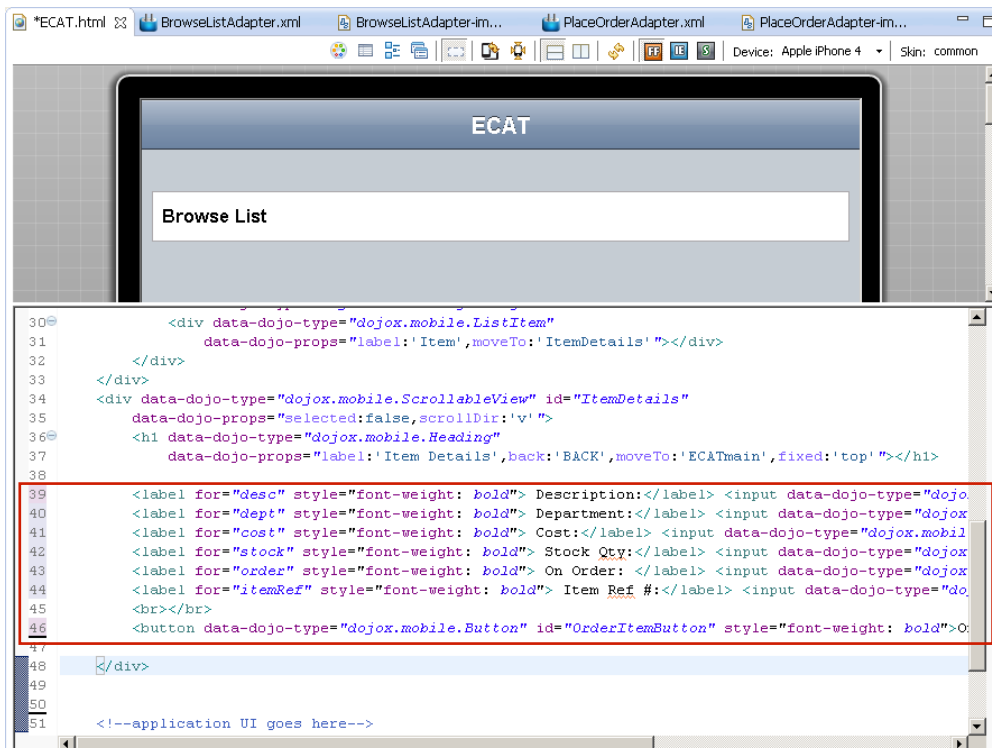

Once you have a blank line, paste (**right-click > paste**) the following code at the beginning of the line.

```

    <label for="desc" style="font-weight: bold"> Description:</label>
<input data-dojo-type="dojox.mobile.TextBox" id="desc" class="itemText"><br>
    <label for="dept" style="font-weight: bold"> Department:</label>
<input data-dojo-type="dojox.mobile.TextBox" class="itemText2"
id="dept"><br>
    <label for="cost" style="font-weight: bold"> Cost:</label> <input
data-dojo-type="dojox.mobile.TextBox" class="itemText3" id="cost"><br></br>
    <label for="stock" style="font-weight: bold"> Stock Qty:</label>
<input data-dojo-type="dojox.mobile.TextBox" class="itemText4"
id="stock"><br>
    <label for="order" style="font-weight: bold"> On Order: </label>
<input data-dojo-type="dojox.mobile.TextBox" class="itemText5"
id="order"><br>
    <label for="itemRef" style="font-weight: bold"> Item Ref
#:</label> <input data-dojo-type="dojox.mobile.TextBox" class="itemText6"
id="itemRef"><br>
    <br>
    <button data-dojo-type="dojox.mobile.Button" id="OrderItemButton"
style="font-weight: bold" onclick="placeOrder(itemRef.value)">Order
Item</button>

```

Copy and Paste code from above or **Snippet#2.txt** from the accompanying Lab Snippets folder on the desktop for cut & paste. Make sure to **save the Ecat.html** file before proceeding. Below is the final look with the new code in the red rectangle.



___17. Add CSS to ECAT.css to provide a “branded” look the ECAT application, overriding defaults and giving a more consistent experience across different devices.

- ___a. In the Project Explorer view, find and open (**double-click**) **/ECAT/apps/ECAT/common/css/ECAT.css** in the editor, **delete the entire contents** and **copy and paste** the following CSS text. You can also copy and paste code from **ECATcss.txt** from the accompanying Lab Snippets folder on the desktop for cut & paste. Be sure to **save** the changes to the ECAT.css.

```

/* Reset CSS */
a, abbr, address, article, aside, audio, b, blockquote, body, canvas, caption,
cite, code, dd, del, details, dfn, dialog, div, dl, dt, em, fieldset,
figcaption, figure, footer, form, h1, h2, h3, h4, h5, h6, header, hgroup,
html, i, iframe, img, ins, kbd, label, legend, li, mark, menu, nav, object,
ol, p, pre, q, samp, section, small, span, strong, sub, summary, sup, table,
tbody, td, tfoot, th, thead, time, tr, ul, var, video {
    margin: 0;
    padding: 0;
}
/* Worklight container div */
#content {
    height: 460px;
    margin: 0 auto;
    width: 320px;
}
.itemText {
    margin-top: 5px;
    margin-left: 19px;
}
.itemText2 {
    margin-top: 20px;
    margin-left: 18px;
}
.itemText3 {
    margin-top: 25px;
    margin-left: 72px;
}
.itemText4 {
    margin-top: 30px;
    margin-left: 31px;
}
.itemText5 {
    margin-top: 35px;
    margin-left: 34px;
}
.itemText6 {
    margin-top: 40px;
    margin-left: 31px;
}
.spacer {
    margin-top: 100px;
}
.mblView {
    background: -webkit-gradient(linear, left top, left bottom,
from(#096093), to(#ffffff)) !important;
}

```

```
.mblHeading{
    background:-webkit-gradient(linear, left top, left bottom,
from(#379AC4), to(#096193)) !important;
}
/* workaround for white on white in simpleDialogs */
#WLdialog {
color:black;
}
```

By adding in the CSS Styles provided, we are able to make the application running on all devices look the same. The ECAT/common/css folder contains a stylesheet (ECAT.css) that overrides the CSS for individual platforms (Android, iOS, ect.) so changes we made here will reflect in all device types.

1.6 Retrieving Data with a Worklight Adapter

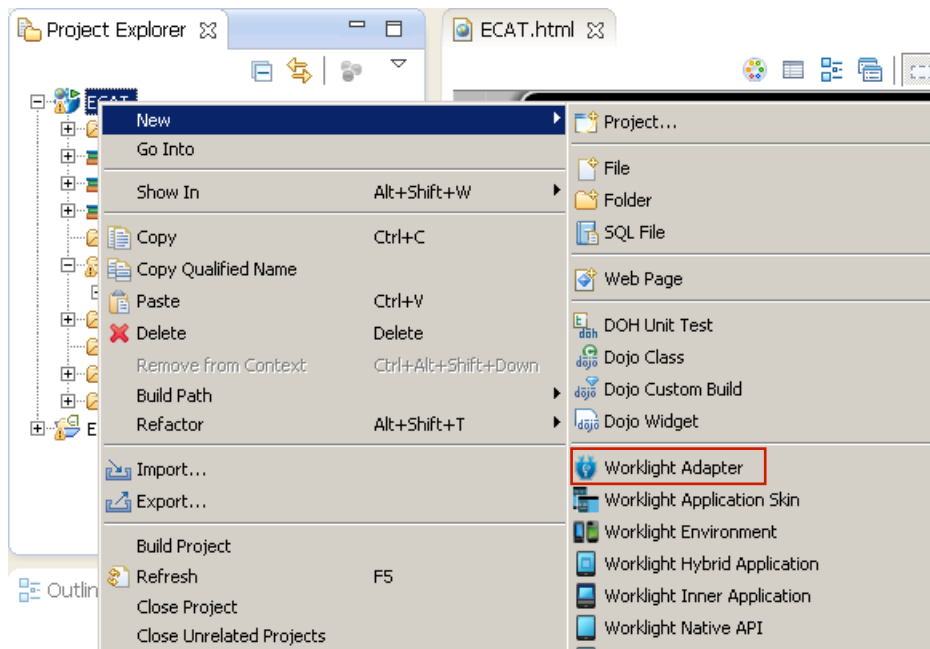
In this portion of the lab, you will build two Worklight HTTP adapters and integrate them into the ECAT application.

A Worklight adapter is hosted on the Worklight server, and interacts with remote data sources, retrieving data or performing actions. The Worklight client runtime provides a simple, common JavaScript interface to invoke the adapter and exchange data from a mobile application.

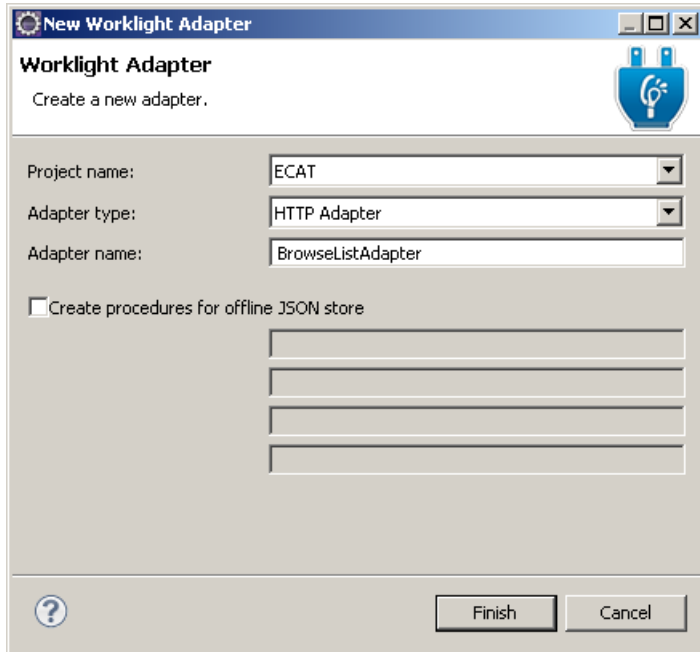
In this lab you will be connecting the mobile front-end application that you have built with back-end services and data from the original version of this application, running in CICS Transaction Server on z/OS. This 3270 CICS application has been web-service enabled so that we can use modern application interfaces, such as Web and Mobile, to re-use the business logic and access data from our legacy application. These web-services can be communicated with by sending SOAP messages through HTTP 'post' requests. In this next section, you will build the Worklight Adapters that contain the messaging structure for sending and receiving information to/from the System z.

__1. Create a new Worklight Adapter.

__a. In the Project Explorer view, right-click on **ECAT** project > **New** > **Worklight Adapter**.

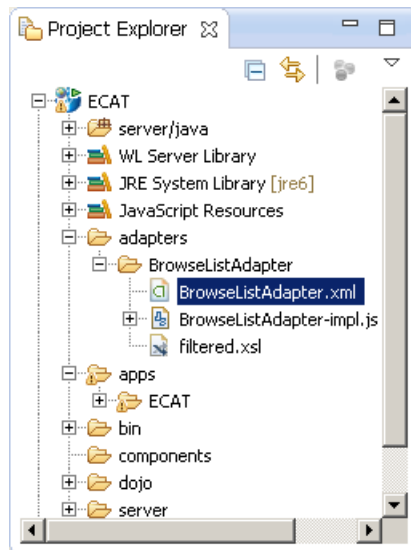


__b. In the New Worklight Adapter dialog, select the Adapter type **HTTP Adapter** and enter **BrowseListAdapter** as the name.



__c. Click **Finish**.

The **BrowseListAdapter** Adapter will be created with the following contents:



BrowseListAdapter.xml – Adapter configuration containing connection info, security info and registered methods for the adapter

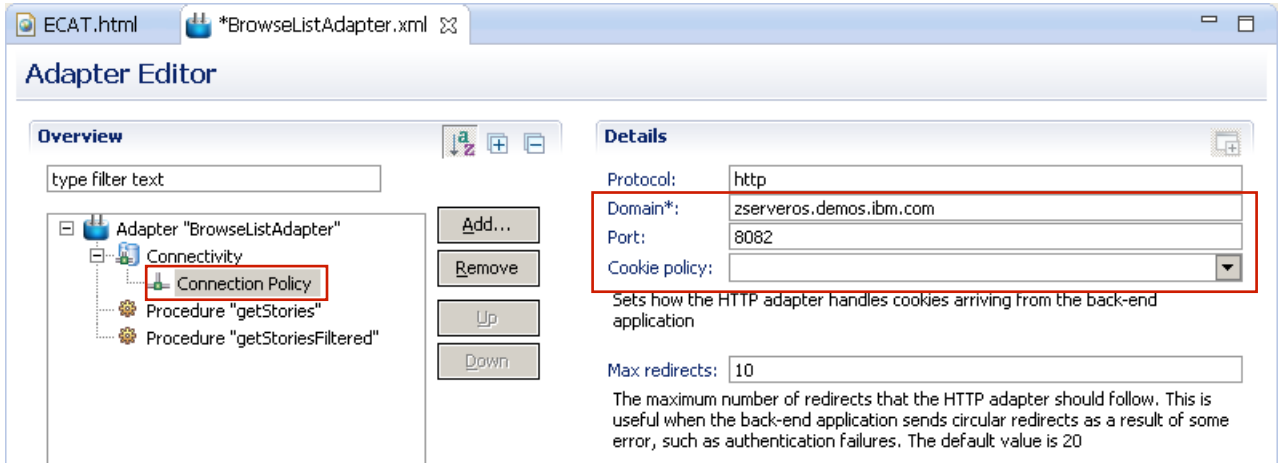
BrowseListAdapter-impl.js – JavaScript implementation file for the adapter methods

filtered.xsl – XSL stylesheet for use in filtering/processing returned data

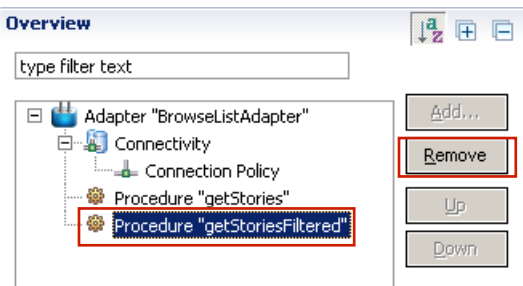
__2. Edit the BrowseListAdapter.xml file

The **BrowseListAdapter.xml** file should be open in the editor, with tabs for Design and Source. The default adapter is created as a sample to retrieve RSS feed data from cnn.com and offers methods for both raw and field-filtered data. We will over-write the default values and methods to connect to our CICS application running on a backend z Series server.

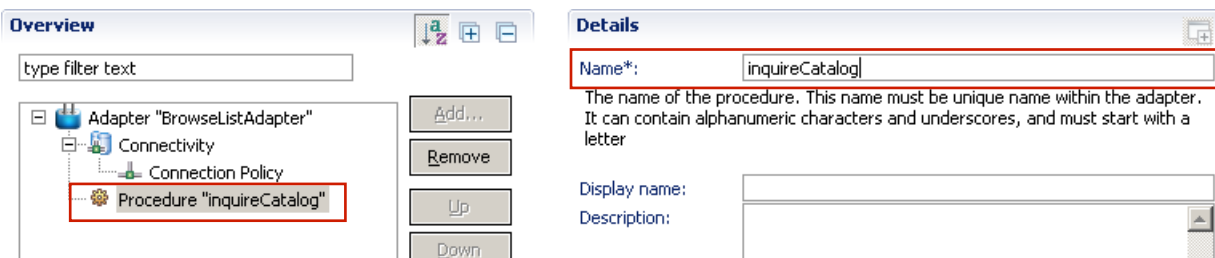
- __a. Select the **Design** tab of the BrowseListAdapter.xml editor (on the bottom left), expand the **Connectivity** node and select the **Connection Policy** to edit the HTTP connection details.
- __b. Change the Domain to **zserveros.demos.ibm.com**
- __c. Change the Port to **8082**
- __d. Set the Cookie policy to **blank**



- __e. Select **Procedure "getStoriesFiltered"** > click the **Remove** button



- __f. Select **Procedure "getStories"** and change the name to **inquireCatalog**



- __g. **Save** the file.

This step replaces the two procedure entries for `getStories` and `getStoriesFiltered` with a new procedure called **inquireCatalog** (shown in the Source view below).

```

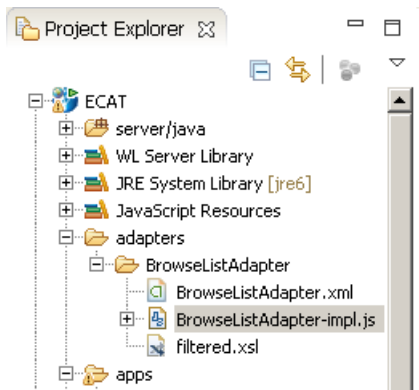
1 <?xml version="1.0" encoding="UTF-8"?>
2 <!--
3     Licensed Materials - Property of IBM
4     5725-G92 (C) Copyright IBM Corp. 2011, 2012. All Rights Reserved.
5     US Government Users Restricted Rights - Use, duplication or
6     disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
7 -->
8 <wl:adapter name="BrowseListAdapter"
9     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
10    xmlns:wl="http://www.worklight.com/integration"
11    xmlns:http="http://www.worklight.com/integration/http">
12
13    <displayName>BrowseListAdapter</displayName>
14    <description>BrowseListAdapter</description>
15    <connectivity>
16        <connectionPolicy xsi:type="http:HTTPConnectionPolicyType">
17            <protocol>http</protocol>
18            <domain>zserveros.demos.ibm.com</domain>
19            <port>8082</port>
20        </connectionPolicy>
21        <loadConstraints maxConcurrentConnectionsPerNode="2" />
22    </connectivity>
23
24    <procedure name="inquireCatalog"/>
25

```

- __3. Add the implementation for the `inquireCatalog` procedure to the `BrowseListAdapter-impl.js` file.

By default, adapters are implemented in JavaScript. In this step, open the `BrowseListAdapter-impl.js` file, remove the code for the default procedures provided by the template and paste the code for our **inquireCatalog** procedure.

- __a. Expand **ECAT** project > expand **adapters** folder > expand **BrowseListAdapter** folder > **double-click** to open the **BrowseListAdapter-impl.js** file into the editor.



- __b. Remove the code and comments for the 3 functions `getStories`, `getStoriesFiltered`, and `getPath`. **Delete the entire contents** of the **BrowseListAdapter-impl.js** file.

__c. Paste the following JavaScript into BrowseListAdapter-impl.js:

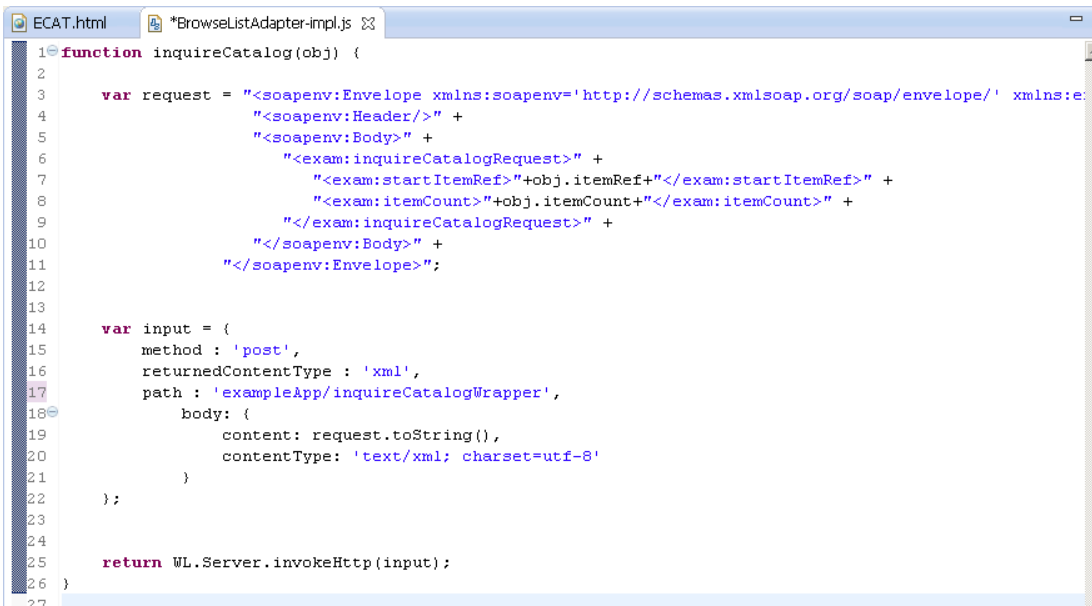
```
function inquireCatalog(obj) {

    var request = "<soapenv:Envelope
xmlns:soapenv='http://schemas.xmlsoap.org/soap/envelope/'
xmlns:exam='http://www.ECAT.BrowseListAdapter.com'>" +
        "<soapenv:Header/>" +
        "<soapenv:Body>" +
            "<exam:inquireCatalogRequest>" +
                "<exam:startItemRef>" + obj.itemRef + "</exam:startItemRef>" +
                "<exam:itemCount>" + obj.itemCount + "</exam:itemCount>" +
                "</exam:inquireCatalogRequest>" +
            "</soapenv:Body>" +
        "</soapenv:Envelope>";

    var input = {
        method : 'post',
        returnedContentType : 'xml',
        path : 'exampleApp/inquireCatalogWrapper',
        body: {
            content: request.toString(),
            contentType: 'text/xml; charset=utf-8'
        }
    };

    return WL.Server.invokeHttp(input);
}
```

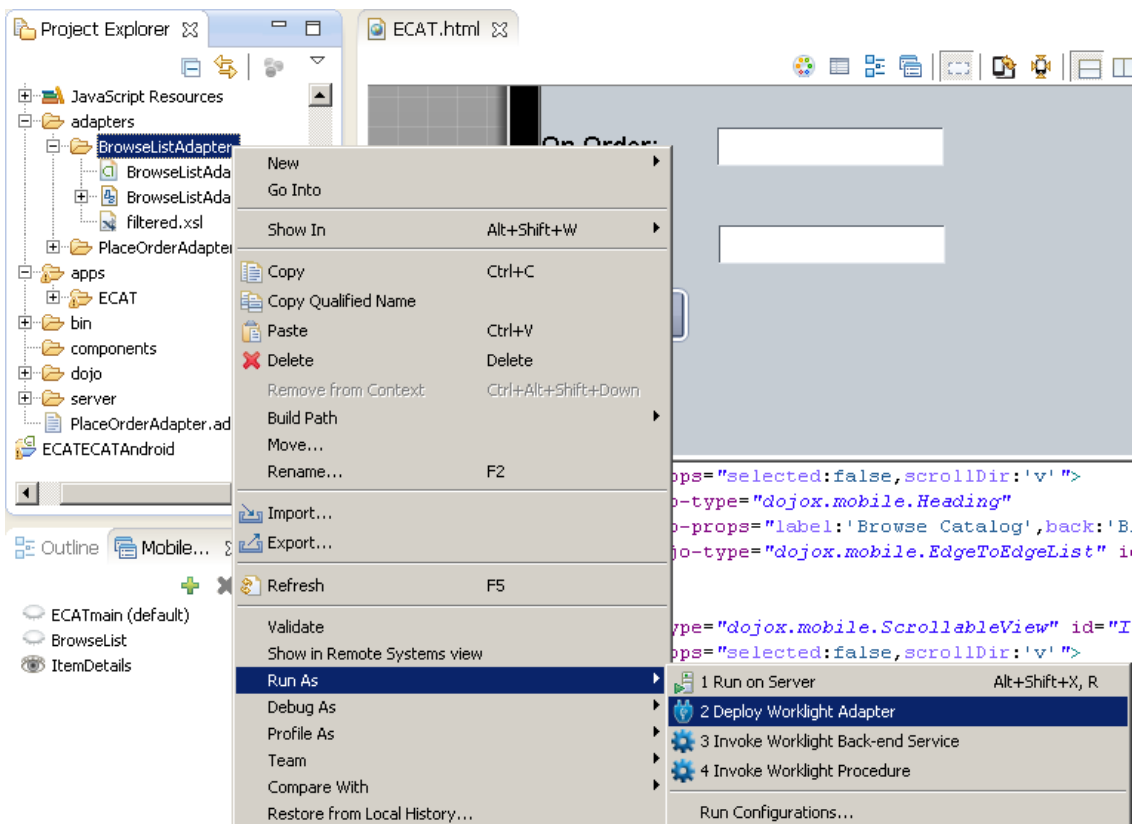
Copy and Paste code from above or **Snippet#3.txt** from the accompanying Lab Snippets folder on the desktop for cut & paste. Below is the final look.



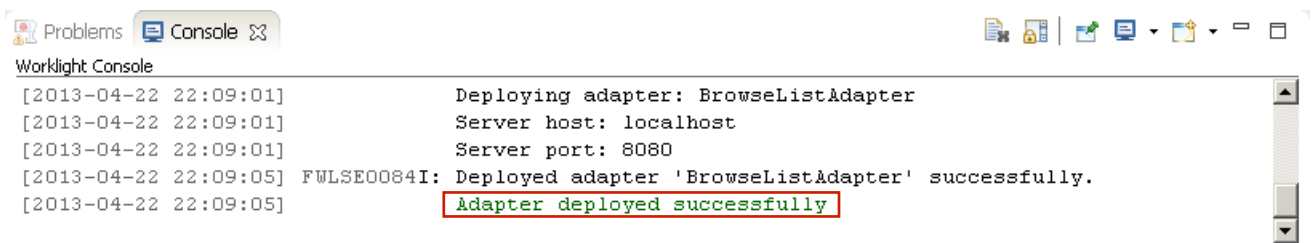
```
ECAT.html *BrowseListAdapter-impl.js
1 function inquireCatalog(obj) {
2
3     var request = "<soapenv:Envelope xmlns:soapenv='http://schemas.xmlsoap.org/soap/envelope/' xmlns:e
4         "<soapenv:Header/>" +
5         "<soapenv:Body>" +
6             "<exam:inquireCatalogRequest>" +
7                 "<exam:startItemRef>" + obj.itemRef + "</exam:startItemRef>" +
8                 "<exam:itemCount>" + obj.itemCount + "</exam:itemCount>" +
9                 "</exam:inquireCatalogRequest>" +
10            "</soapenv:Body>" +
11        "</soapenv:Envelope>";
12
13
14    var input = {
15        method : 'post',
16        returnedContentType : 'xml',
17        path : 'exampleApp/inquireCatalogWrapper',
18        body: {
19            content: request.toString(),
20            contentType: 'text/xml; charset=utf-8'
21        }
22    };
23
24
25    return WL.Server.invokeHttp(input);
26 }
27
```


As a summary, our adapter configuration file (**BrowseListAdapter.xml**) contains the protocol (**http**), host (**zserveros.demos.ibm.com**) and port (**8082**) information which defines the target System z server address and port that the original 3270 CICS application has been web-service enabled for communication on. Our procedure defines the remainder of the service URL (**/exampleApp/inquireCatalogWrapper**), the HTTP method (**post**) and the content type to expect (**xml**). There are two parameters we are passing into the adapter, as required by the back-end service that we are invoking. These parameters include 'itemRef' which tells what item number we are starting to retrieve data from in the catalog, and 'itemCount' which tells how many items in the catalog that we want data for.

- __4. Deploy the BrowseListAdapter.
 - __a. Save all files.
 - __b. Select the **BrowseListAdapter** folder in the Project Explorer, **right-click** and select **Run As > Deploy Worklight Adapter**.

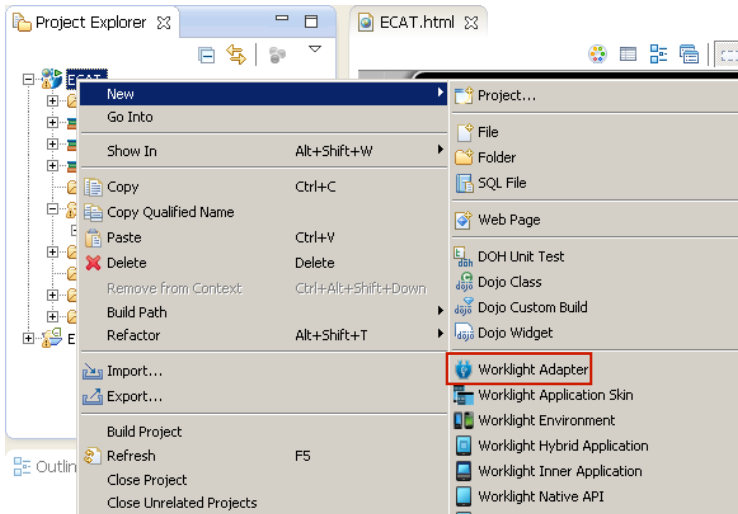


- __c. Watch the **console** for the message that the adapter has been successfully deployed.

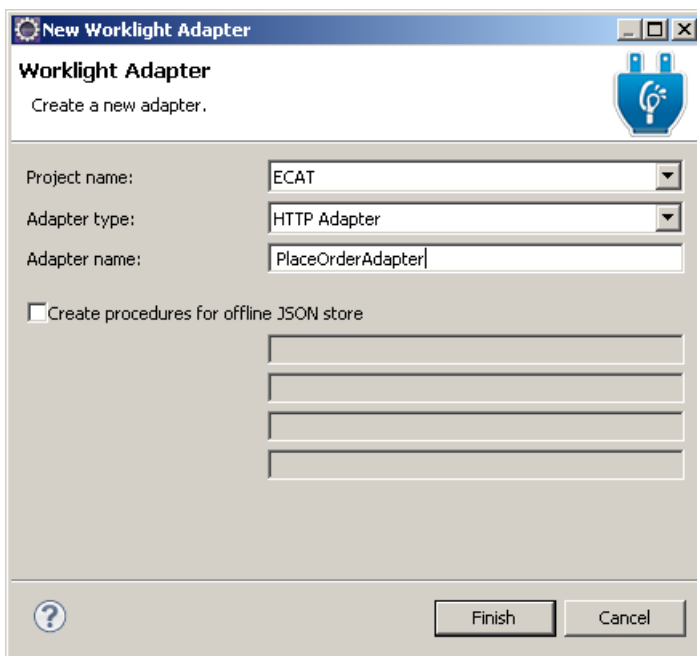


__5. Create the second Worklight Adapter.

__a. In the Project Explorer view, right-click on **ECAT** project > **New** > **Worklight Adapter**.



__b. In the New Worklight Adapter dialog, select the Adapter type **HTTP Adapter** and enter **PlaceOrderAdapter** as the name.

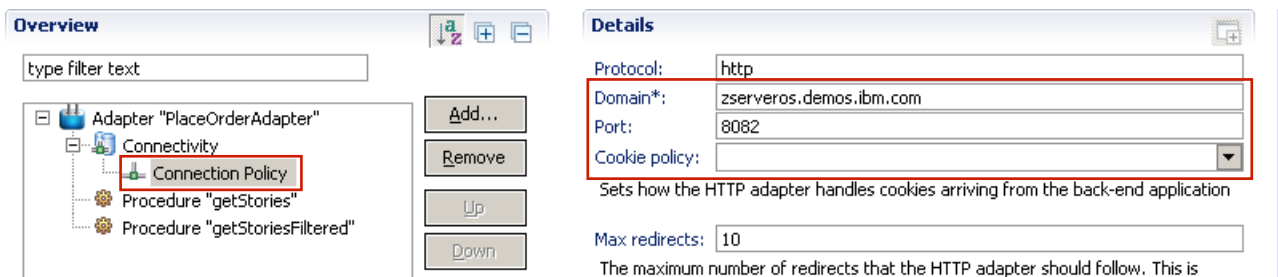


__c. Click **Finish**.

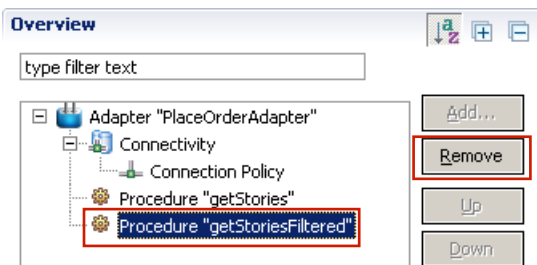
__6. Edit the PlaceOrderAdapter.xml file

The **PlaceOrderAdapter.xml** file should be open in the editor, with tabs for Design and Source. We will over-write the default values and methods to connect to our CICS application running on a backend z Series server.

- __a. Select the **Design** tab of the PlaceOrderAdapter.xml editor (on the bottom left), expand the **Connectivity** node and select the **Connection Policy** to edit the HTTP connection details.
- __b. Change the Domain to **zserveros.demos.ibm.com**
- __c. Change the Port to **8082**
- __d. Set the Cookie policy to **blank**



- __h. Select Procedure **"getStoriesFiltered"** > click the **Remove** button

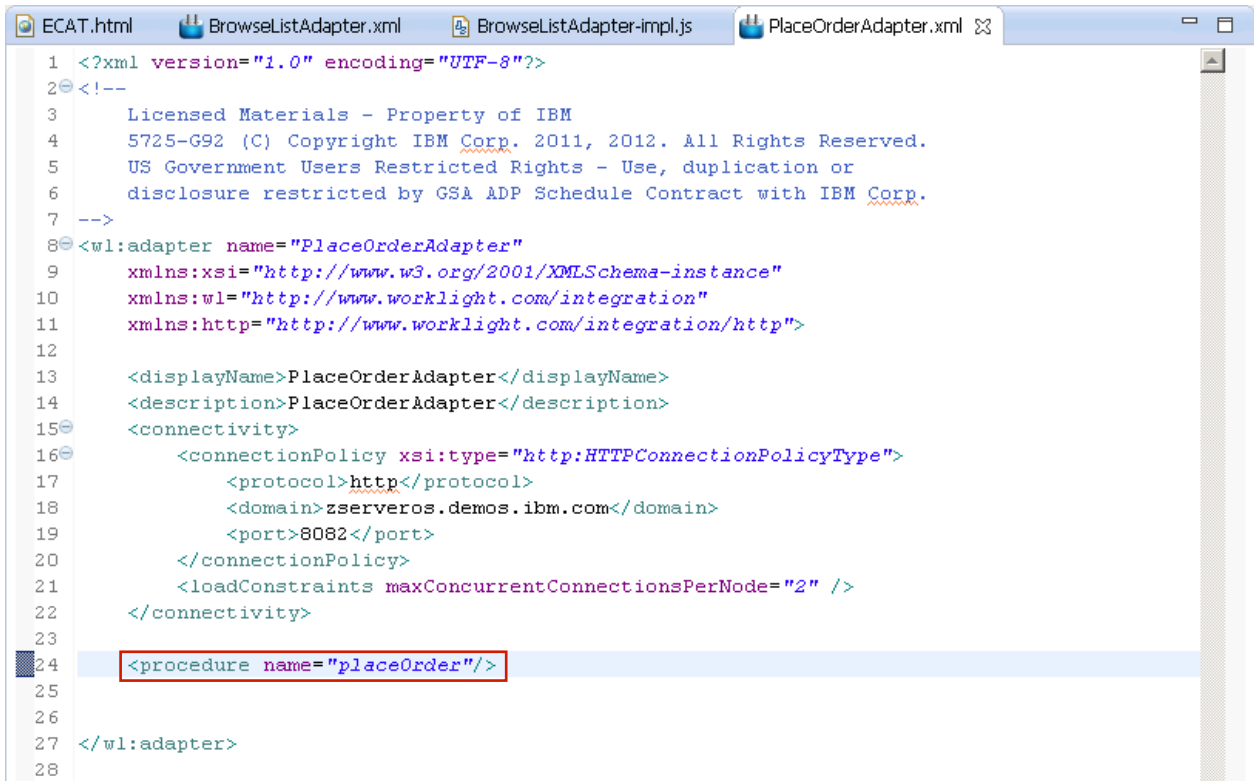


- __i. Select Procedure **"getStories"** and change the name to **placeOrder**



- __j. **Save** the file.

This step replaces the two procedure entries for `getStories` and `getStoriesFiltered` with a new procedure called **placeOrder** (shown in the Source view below).



```

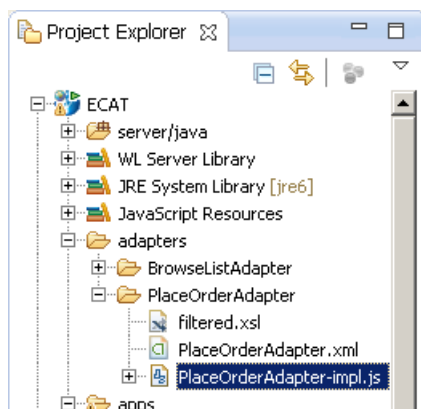
1 <?xml version="1.0" encoding="UTF-8"?>
2 <!--
3     Licensed Materials - Property of IBM
4     5725-G92 (C) Copyright IBM Corp. 2011, 2012. All Rights Reserved.
5     US Government Users Restricted Rights - Use, duplication or
6     disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
7 -->
8 <wl:adapter name="PlaceOrderAdapter"
9     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
10    xmlns:wl="http://www.worklight.com/integration"
11    xmlns:http="http://www.worklight.com/integration/http">
12
13    <displayName>PlaceOrderAdapter</displayName>
14    <description>PlaceOrderAdapter</description>
15    <connectivity>
16        <connectionPolicy xsi:type="http:HTTPConnectionPolicyType">
17            <protocol>http</protocol>
18            <domain>zserveros.demos.ibm.com</domain>
19            <port>8082</port>
20        </connectionPolicy>
21        <loadConstraints maxConcurrentConnectionsPerNode="2" />
22    </connectivity>
23
24    <procedure name="placeOrder"/>
25
26
27 </wl:adapter>
28

```

- __7. Add the implementation for the `placeOrder` procedure to the `PlaceOrderAdapter-impl.js` file.

By default, adapters are implemented in JavaScript. In this step, open the `PlaceOrderAdapter-impl.js` file, remove the code for the default procedures provided by the template and paste the code for our **placeOrder** procedure.

- __a. Expand **ECAT** project > expand **adapters** folder > expand **PlaceOrderAdapter** folder > **double-click** to open the **PlaceOrderAdapter-impl.js** file into the editor.



- __e. Remove the code and comments for the 3 functions `getStories`, `getStoriesFiltered`, and `getPath`. **Delete the entire contents** of the `PlaceOrderAdapter-impl.js` file. The finished code view is below.



```
1 function placeOrder(obj) {
2
3     var request = "<soapenv:Envelope xmlns:soapenv='http://schemas.xmlsoap.org/soap/envelope/' xmlns:e:
4         <soapenv:Header/>" +
5         "<soapenv:Body>" +
6             "<exam:placeOrderRequest>" +
7                 "<exam:orderRequest>" +
8                     "<exam:userId>" + obj.userId + "</exam:userId>" +
9                     "<exam:chargeDepartment>" + obj.dept + "</exam:chargeDepartment>" +
10                    "<exam:itemReference>" + obj.itemRef + "</exam:itemReference>" +
11                    "<exam:quantityRequired>" + obj.quantity + "</exam:quantityRequired>" +
12                    "</exam:orderRequest>" +
13                "</exam:placeOrderRequest>" +
14            "</soapenv:Body>" +
15        "</soapenv:Envelope>";
16
17
18     var input = {
19         method : 'post',
20         returnedContentType : 'xml',
21         path : 'exampleApp/placeOrderWrapper',
22         body: {
23             content: request.toString(),
24             contentType: 'text/xml; charset=utf-8'
25         }
26     };
27
28
29     return WL.Server.invokeHttp(input);
30 }
31
```

__f. **Copy and Paste** the following JavaScript into **PlaceOrderAdapter-impl.js**:

```
function placeOrder(obj) {

    var request = "<soapenv:Envelope
xmlns:soapenv='http://schemas.xmlsoap.org/soap/envelope/'
xmlns:exam='http://www.exampleApp.placeOrderRequest.com'>" +
        "<soapenv:Header/>" +
        "<soapenv:Body>" +
            "<exam:placeOrderRequest>" +
                "<exam:orderRequest>" +
                    "<exam:userId>"+obj.userId+"</exam:userId>"
+
        "<exam:chargeDepartment>"+obj.dept+"</exam:chargeDepartment>" +
        "<exam:itemReference>"+obj.itemRef+"</exam:itemReference>" +
        "<exam:quantityRequired>"+obj.quantity+"</exam:quantityRequired>" +
            "</exam:orderRequest>" +
            "</exam:placeOrderRequest>" +
            "</soapenv:Body>" +
            "</soapenv:Envelope>";

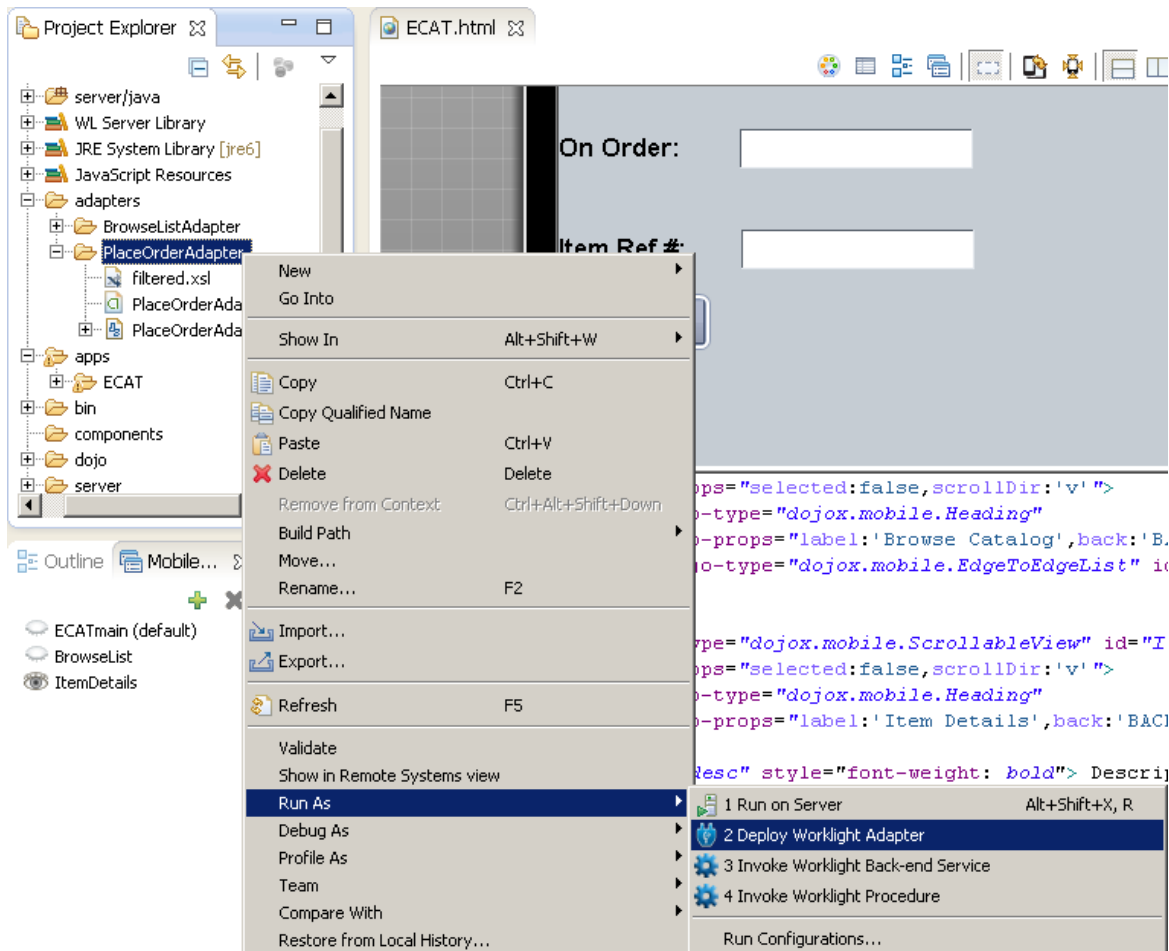
    var input = {
        method : 'post',
        returnedContentType : 'xml',
        path : 'exampleApp/placeOrderWrapper',
        body: {
            content: request.toString(),
            contentType: 'text/xml; charset=utf-8'
        }
    };

    return WL.Server.invokeHttp(input);
}
```

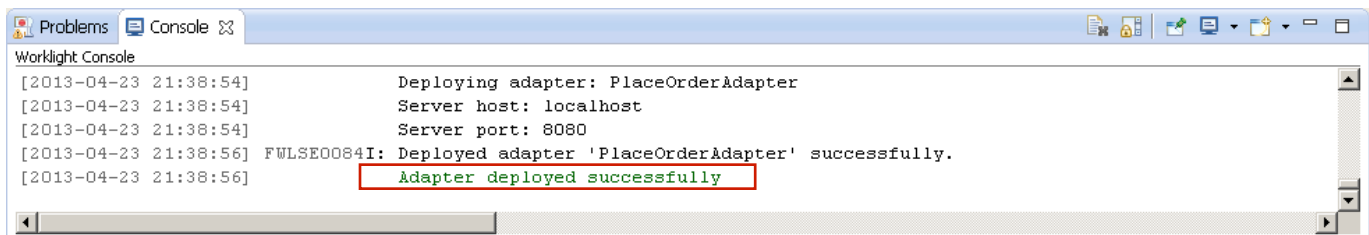
Copy and Paste code from above or **Snippet#4.txt** from the accompanying Lab Snippets folder on the desktop for cut & paste. Be sure to **Save your changes** to **PlaceOrderAdapter-impl.js**.

In summary, our Adapter configuration file (**PlaceOrderAdapter.xml**) contains the protocol (**http**), host (**zserveros.demos.ibm.com**) and port (**8082**) information which defines the target System z server address and port that the original 3270 CICS application has been web-service enabled for communication on. Our procedure defines the remainder of the service URL (**/exampleApp/placeOrderWrapper**), the HTTP method (**post**) and the content type to expect (**xml**). There are four parameters we are passing into the adapter, as required by the back-end service that we are invoking. These parameters include **'itemRef'** which tells what item number we are placing an order for, **'quantity'** which tells how many of the item we want from the catalog, **'userId'** which is the I.D. of the user placing the order, and **'dept'** which is the code for the department that will be charged for the order.

- __8. Deploy the PlaceOrderAdapter.
- __d. Save all files.
- __e. Select the **PlaceOrderAdapter** folder in the Project Explorer, **right-click** and select **Run As > Deploy Worklight Adapter**.



- __f. Watch the **console** for the message that the adapter has been successfully deployed.

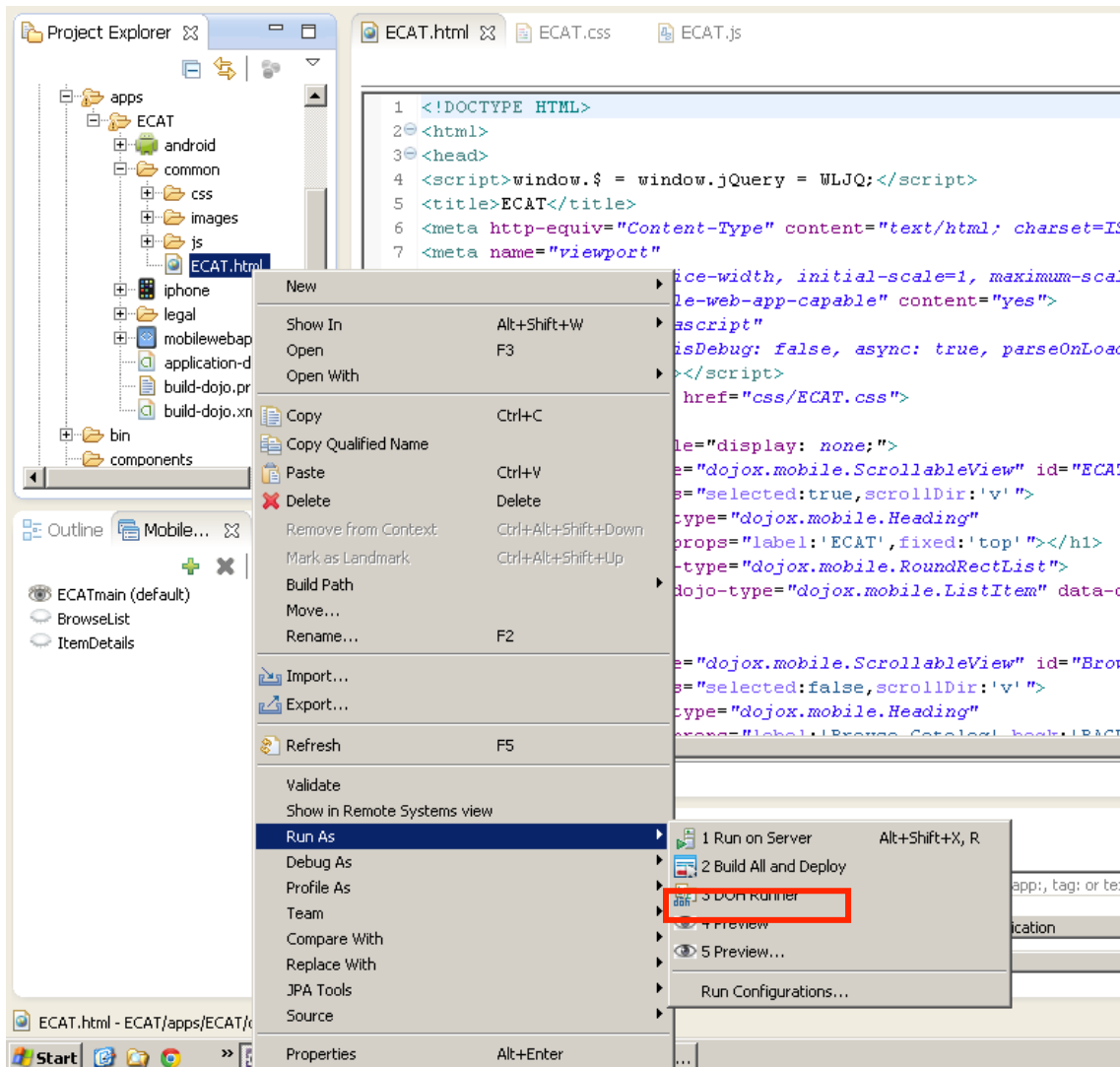


Congratulations you have successfully used the Worklight Studio to build a Worklight application with multiple mobile device environments, navigation between views, and are set to retrieve data from a back-end service with a Worklight adapter.

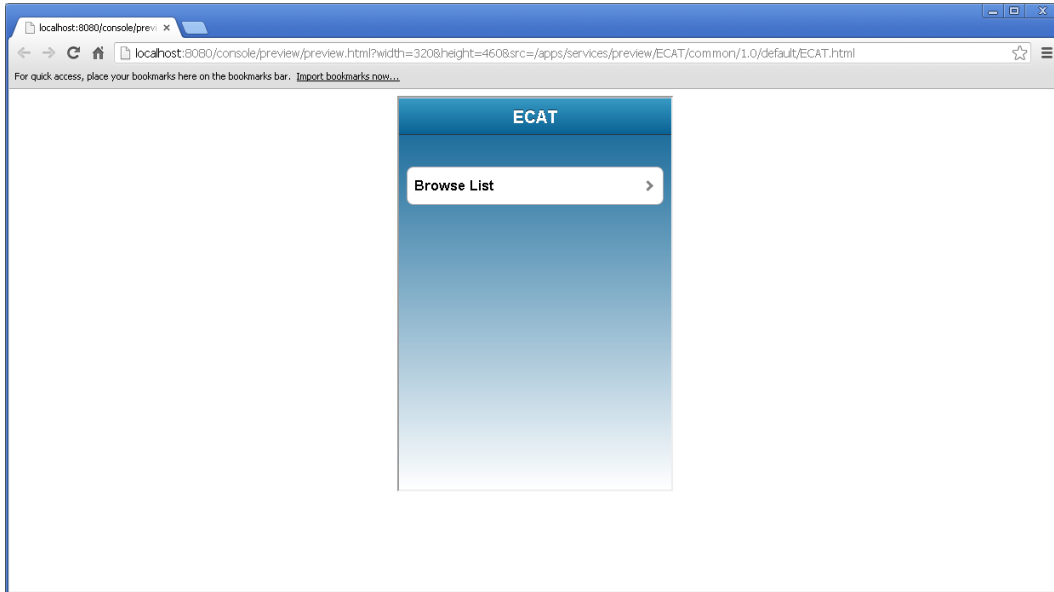
1.7 Test in Mobile Browser Simulator

The final step is to test the ECAT application using the **Mobile Browser Simulator**. A new external browser window will open with the simulator rendering our ECAT application.

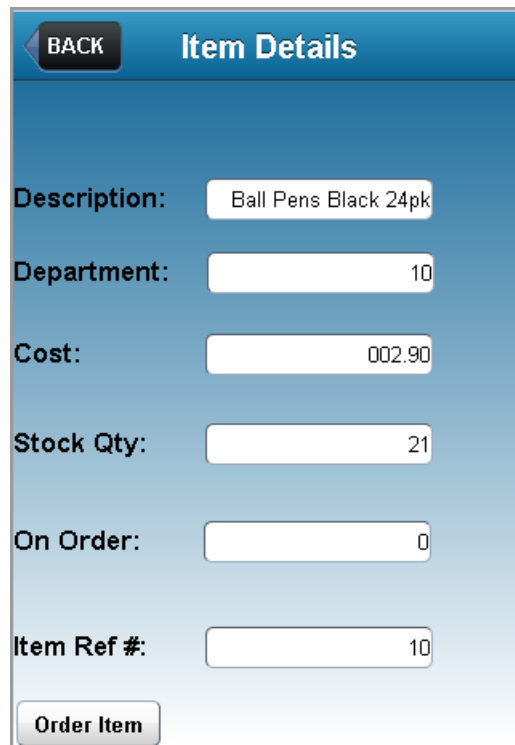
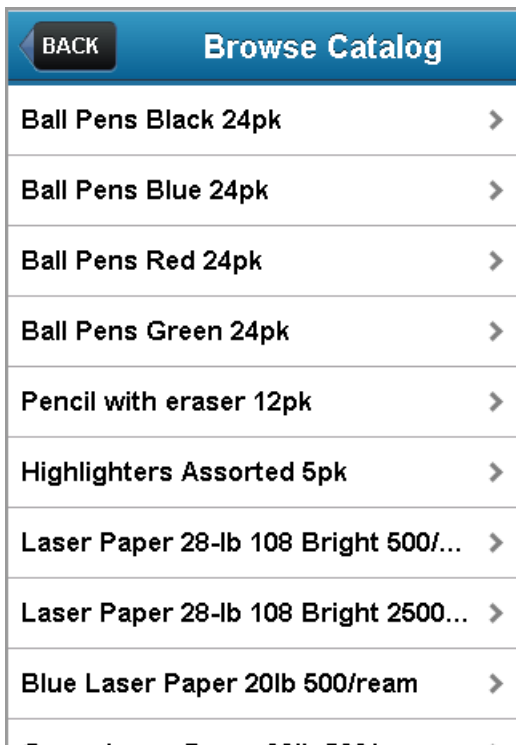
_1. Right click on either the **common** folder (to run the common resource web app) or the ECAT.html file within the common folder and select **Run as > Preview** (as shown below)



_2. A new external browser window will open with the **Mobile Browser Simulator** in which the ECAT Android application should be displayed. (This may take a few seconds to a few minutes while the application is built and deployed completely).



_3. Navigate the views and test the Adapter:



1.8 Summary

In this lab you have learned how to use Worklight Studio to create a cross platform mobile application using HTML5, CSS, JavaScript, the Dojo Mobile framework. You have learned how to target specific devices such as iPhone and Android phones and seen some very basic customizations that can be applied for making the application look consistent across platforms. You have also seen how to use the Mobile Browser Simulator within both the Worklight Studio and the Worklight Console to test the application in preview mode.

You should now be familiar now with the Worklight Studio environment and the common development tasks associated with building a mobile application extending the capabilities of existing enterprise applications running on System z.

Congratulations!