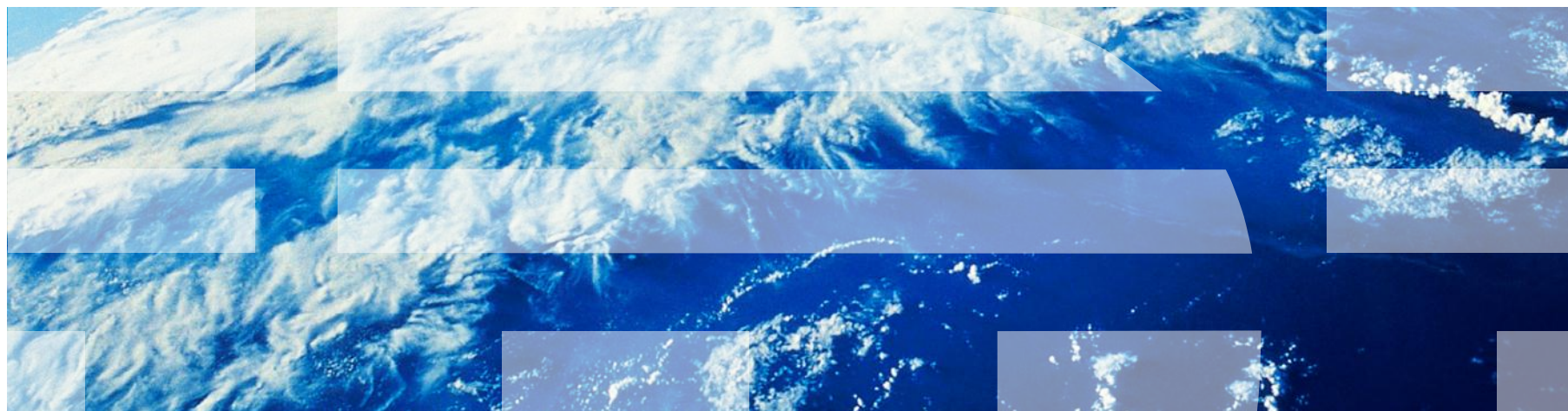


# ***IBM Worklight Foundation V6.2.0 Getting Started***

Container for advanced pages



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- See <http://www.ibm.com/ibm/us/en/>

## ***Using this module and its companion sample***

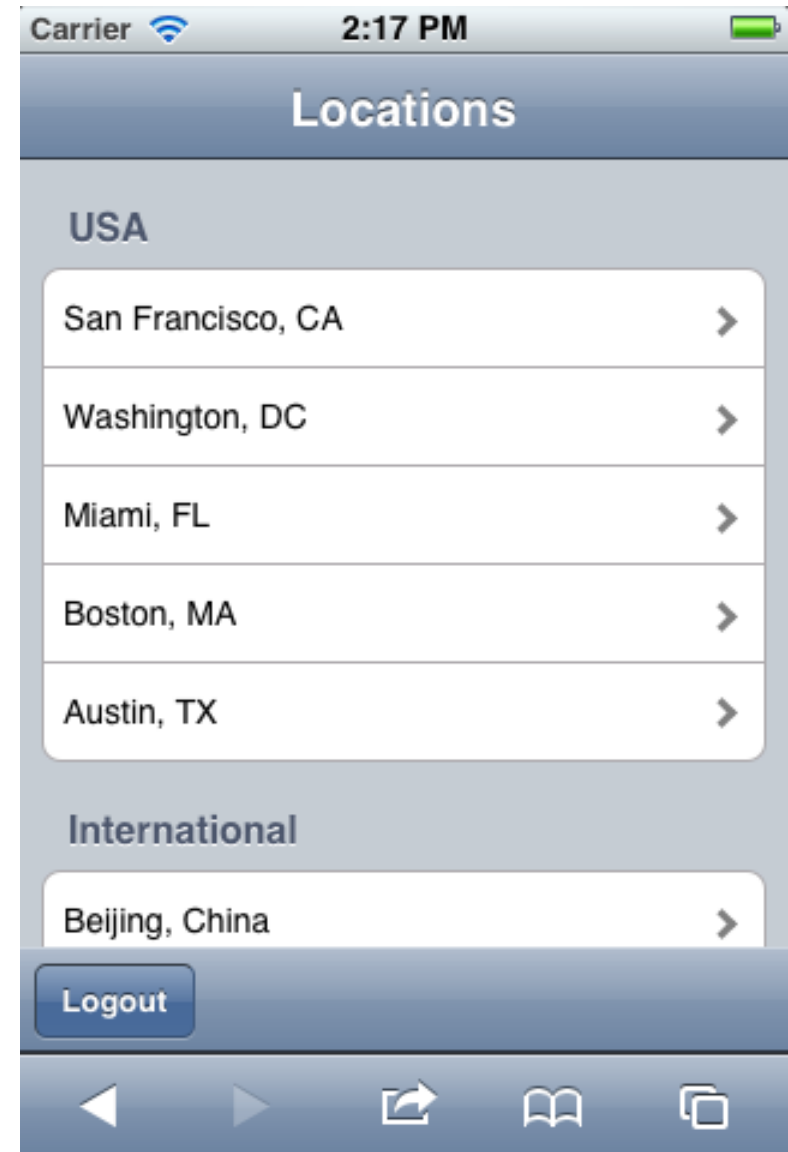
- This module and its companion sample are intended for use with either the IBM® Worklight® Consumer Edition or the IBM Worklight Enterprise Edition.
  - You cannot use as is the sample that is associated with this module with the free IBM Worklight Developer Edition. This sample provides a WAR file that demonstrates the remote load functionality in this module. This WAR file requires a servlet container, such as Apache Tomcat, WebSphere® Application Server Full Profile, or WebSphere Application Server Liberty Profile.

# Agenda

- Background of IBM Mobile Conference application
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  - IBM Worklight Client APIs
  - IBM Worklight integration
  - Encrypted cache
  - Camera support
- Proxy considerations

# Background

- IBM Mobile Conference application
  - Mobile web application
  - Server programming model
    - JavaServer™ Pages (JSP)
    - JavaServer Pages Standard Tag Library (JSTL)
    - JavaServer Pages Expression Language (EL)
  - Client programming model
    - Dojox Mobile
    - Dojo Mobile Device Theming
  - Security
    - Container managed
    - Java™ Enterprise Edition (Java EE) form-based login



## Mobile views

- Dojo provides mobile widgets that developers can use to quickly generate mobile views.

```
<div id="locations" dojoType="dojox.mobile.ScrollableView" selected="true">
  <h1 dojoType="dojox.mobile.Heading" label="Locations"></h1>
  <div class="list-category" dojoType="dojox.mobile.RoundRectCategory">USA</div>
  <ul dojoType="dojox.mobile.RoundRectList">
    <c:forEach var="location" items="${applicationScope.locationRegistryList['usa']}">
      <li dojoType="dojox.mobile.ListItem" class="mblVariableHeight"
        url="/confs.jsp?locationId=${location}"
        urlTarget="conferences" transition="slide">
        <div class="list-detail">
          <div>${locationMap[location].city}, ${locationMap[location].state}</div>
        </li>
      </c:forEach>
    </ul>
    .....
  </div>
```

- JSTL provides a simple API for iterating over lists to generate Dojox Mobile list items dynamically on the server.

## Form-based authentication client

- The IBM Mobile Conference application requires users to be registered and authenticated with the enterprise that is hosting the application.
- The application is protected by a form-based login, by using a mobile web form that is contained within a Dojox Mobile view.

```

<div dojoType="dojox.mobile.View">
  <c:set var="conferences" scope="session" value=""></c:set>
  <h1 style="text-align: center;" dojoType="dojox.mobile.Heading">
    IBM Mobile Conference App</h1>
  <form action="j_security_check" method="post" name="loginForm">
    <div class="logonClass">
      <div>
        <span>Username </span> <input id="username"
          dojoType="dojox.mobile.TextBox"
          name="j_username" />
      </div>
      <div>
        <span>Password </span> <input id="password"
          type="password" name="j_password"
          dojoType="dojox.mobile.TextBox"> </input>
      </div>
      <div style="text-align: center;">
        <input id="login" type="submit" class="mblButton" value="Login"/>
      </div>
    </div>
  </form>
</div>

```

# Form-based authentication server

- The IBM Mobile Conference application is configured to use Java Enterprise Edition Role Support
  - White list or pattern-based URIs of secured resources
  - Support for logout in addition to Java Enterprise Edition standard logout functionality

```

<security-role>
  <role-name>tomcat</role-name>
</security-role>
<security-constraint>
  <display-name>SecurityConstraint</display-name>
  <web-resource-collection>
    <web-resource-name>Conference</web-resource-name>
    <url-pattern>/common/location.jsp</url-pattern>
    <url-pattern>/common/confs.jsp</url-pattern>
    <url-pattern>/common/presenter.jsp</url-pattern>
    <url-pattern>/common/sessions.jsp</url-pattern>
  </web-resource-collection>
  <auth-constraint>
    <role-name>tomcat</role-name>
  </auth-constraint>
</security-constraint>
<login-config>
  <auth-method>FORM</auth-method>
  <form-login-config>
    <form-login-page>/common/logon.jsp</form-login-page>
    <form-error-page>/common/logonError.jsp</form-error-page>
  </form-login-config>
</login-config>
</web-app>

```

```

<div style="position: relative; float: left;">
  <form method="post" action="ibm_security_logout" name="logout">
    <span data-dojo-type="dojox.mobile.ToolBarButton"
      data-dojo-props='onClick:function(){
        window.location="Logout";
        if(window.location.port == 9080){
          // For liberty logout...
          document.forms["logout"].submit();
        }
      }'>
      transition:"slide">Logout</span>
    <input type="hidden" name="logoutExitPage" value="/">
  </form>
</div>
1>

```



# Simplified user registry and role configuration

## Liberty server.xml

```

<server description="new server">
  <!-- Enable features -->
  <featureManager>
    <feature>jsp-2.2</feature>
    <feature>servlet-3.0</feature>
    <feature>localConnector-1.0</feature>
    <feature>appSecurity-1.0</feature>
  </featureManager>

  <httpEndpoint host="9.181.110.137" httpPort="9080"
    httpsPort="9443" id="defaultHttpEndpoint">
  </httpEndpoint>

  <applicationMonitor updateTrigger="mbean"/>

  <basicRegistry id="basic" realm="liberty">
    <user name="demo" password="demo"/>
    <group name="test">
      <member name="demo"/>
    </group>
  </basicRegistry>

  <application context-root="conference"
    id="module_45_2_ContainerForAdvancedPagesWar"
    location="module_45_2_ContainerForAdvancedPagesWar.war"
    name="module_45_2_ContainerForAdvancedPagesWar" type="war">
    <application-bnd>
      <security-role name="liberty">
        <group name="test" />
      </security-role>
    </application-bnd>
  </application>
</server>
  
```

## Tomcat server.xml

```

<GlobalNamingResources>
  <!-- Editable user database that can also be used by
  <UserDatabaseRealm to authenticate users
  -->
  <Resource auth="Container" description="User database that can be updated and saved"
    factory="org.apache.catalina.users.MemoryUserDatabaseFactory" name="UserDatabase"
    pathname="conf/tomcat-users.xml" type="org.apache.catalina.UserDatabase"/>
</GlobalNamingResources>
  
```

### Add role and user in tomcat-users.xml

```

<role rolename="tomcat"/>
<user password="tomcat" roles="tomcat" username="tomcat"/>
  
```

<http://tomcat.apache.org/tomcat-6.0-doc/realm-howto.html>

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- Proxy considerations

## ***Migrating applications to IBM Worklight Foundation***

- By using mobile web technology, you can deploy applications to the widest variety of devices.
- The presence of application stores (for example: Apple iTunes and Google Play) adds a dimension where the hosting and marketing of these applications makes broader-reaching applications less relevant.
- IBM Worklight Foundation provides the solution to building cross platform applications that can be distributed through the application stores by using the hybrid application programming model.
- In the hybrid model, developers typically package the application HTML, CSS, and JavaScript™ code as part of the application that is deployed to the application store.
- In this module, you see the remote loading of dynamic content capability, where the HTML, CSS, and JavaScript code is hosted externally from the natively packaged hybrid.

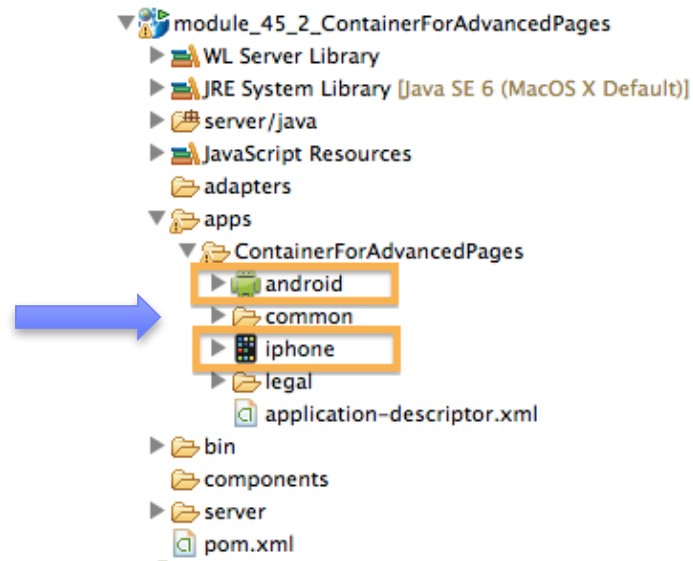
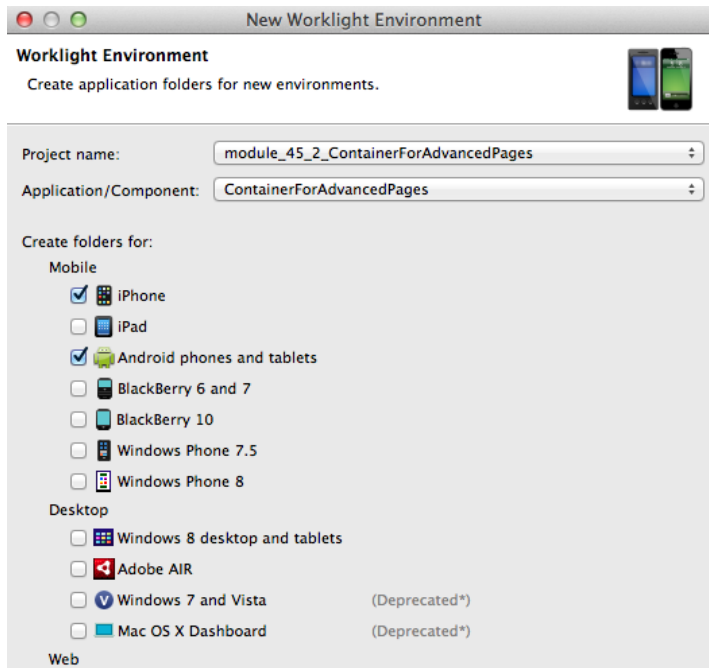
# Creating IBM Worklight applications

- A project and applications are created by using the IBM Worklight Project wizard.
- A project might host multiple applications.
  - However, in this module, you use only one app: ContainerForAdvancedPages.

The image shows two screenshots of the IBM Worklight Project wizard and a project directory tree. The first screenshot, titled "New Worklight Project", shows the "Project Templates" section with "Hybrid Application" selected. The "Name" field contains "ContainerForAdvancedPages". A blue arrow points from this screenshot to the second screenshot, titled "New Worklight Project - Hybrid Application", which shows the "Hybrid Application" configuration screen. The "Application name" field also contains "ContainerForAdvancedPages". A second blue arrow points from this screenshot to a project directory tree on the right. The tree shows a folder structure for "module\_45\_2\_ContainerForAdvancedPages", with the "apps" folder expanded to show a sub-folder named "ContainerForAdvancedPages", which is highlighted with an orange box.

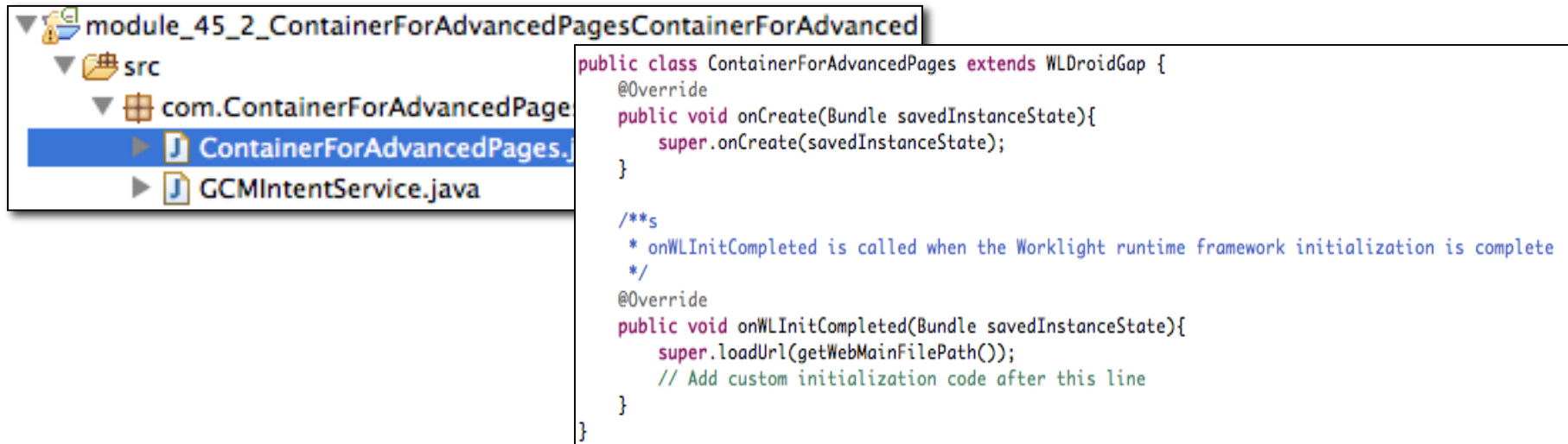
# Worklight environments

- IBM Worklight Foundation provides a model for organizing the application project structure for each targeted environment (for example, Android, iPhone, iPad).
- Because the target environments are known, both the iPhone and Android environments are selected as part of the Worklight Environment wizard.



## Worklight Android environment

- When the Worklight Environment wizard process completes, template files are generated and included in the project.
- Assumptions:
  - The main web resources are packaged with the application (getWebMainFilePath() assumes a local file).
  - The initial HTML page is configured to be loaded when the Android Application initially starts.



The screenshot shows an IDE interface. On the left, a project tree is visible with the following structure:

- module\_45\_2\_ContainerForAdvancedPagesContainerForAdvanced
  - src
    - com.ContainerForAdvancedPage
      - ContainerForAdvancedPages.java
      - GCMIntentService.java

The file `ContainerForAdvancedPages.java` is selected, and its content is displayed in the editor on the right:

```
public class ContainerForAdvancedPages extends WLDroidGap {
    @Override
    public void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
    }

    /**
     * onWLInitCompleted is called when the Worklight runtime framework initialization is complete
     */
    @Override
    public void onWLInitCompleted(Bundle savedInstanceState){
        super.loadUrl(getWebMainFilePath());
        // Add custom initialization code after this line
    }
}
```

## ***Remote loading in Android***

- In the previous section, the default instance of WLDroidGap is attempting to load a local resource.
- Enabling remote loading of resources requires a small modification to the application to load the appropriate resource.
- As part of configuring the IBM Worklight application, you can specify the Worklight root URL, which is where the Worklight Server is hosted.
- IBM Worklight Foundation provides an API for obtaining elements of this root URL such as scheme, host, and port, through the `wlclient.properties` resource that is packaged within the Android application.
- The Remote Load Application uses this API as part of the remote loading.
  - Note: Due to same domain restrictions of the browser (web view), the remotely loaded application and Worklight Server must either be co-located on same host and port, or have a common proxy host and port.

## Remote load Android code snippet

```
*wlclient.properties ✕
wlServerProtocol = http
wlServerHost = 9.181.110.43
wlServerPort = 9080
wlServerContext = /
wlAppId = module_45_2_ContainerForAdvancedPages
wlAppVersion = 1.0
GcmSenderId =
enableSettings = true
testWebResourcesChecksum = false
ignoredFileExtensions =
```

- Developers can use the resource `wlclient.properties` to update the app properties when the application transitions from development to test to production.

- Remote loading uses the `wlclient.properties` file to denote where to remotely load web resources from.

```
*ContainerForAdvancedPages.java ✕
Licensed Materials - Property of IBM
package com.ContainerForAdvancedPages;

import android.os.Bundle;

public class ContainerForAdvancedPages extends WLDroidGap {
    @Override
    public void onWLInitCompleted(Bundle savedInstanceState) {
        // Additional initialization code from onCreate() was moved here
        CookieSyncManager.createInstance(appView.getContext());
        CookieManager.getInstance().removeSessionCookie();
        String resourceHome = getWLConfig().getProtocol() + "://" + getWLConfig().getHost();
        String port = getWLConfig().getPort();
        //If port is 80, do not need use this port, otherwise need add port.
        if(Integer.parseInt(port)!=80){
            resourceHome+=":"+port;
        }
        loadUrl( resourceHome + "/conference", false); // do not clear cache
        appView.setBackgroundColor(Color.WHITE); // set background to white to ensure errors display
    }

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        // Additional initialization code was moved to onWLInitCompleted()
    }

    public void loadUrl(String url) {
        loadUrl(url, false); // default is false
    }
}
```

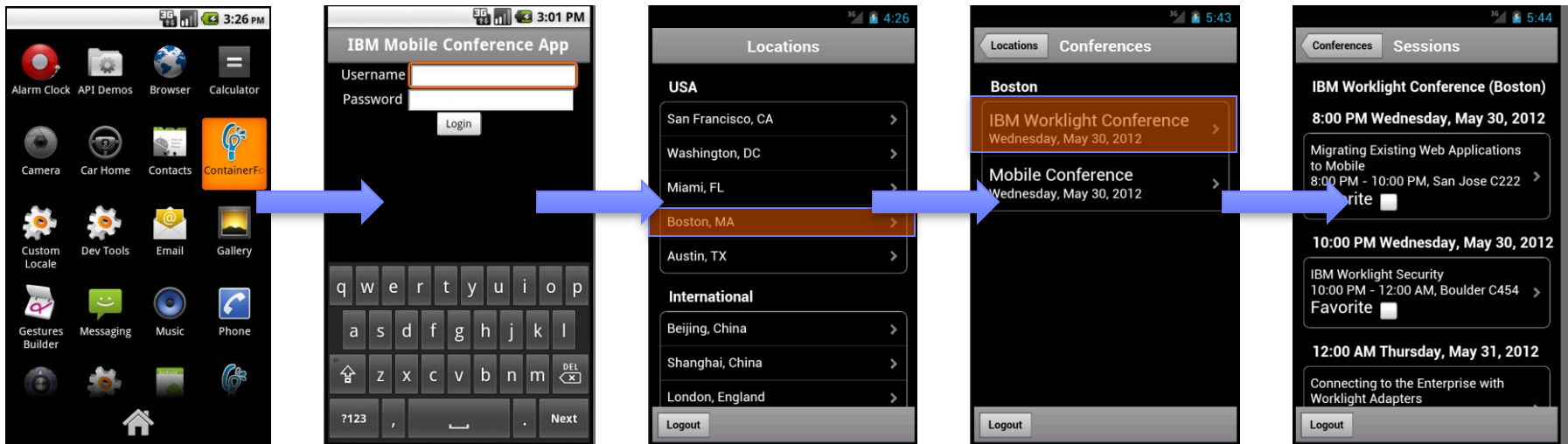


## *Remote load Android code snippet*

- Before you run the Worklight application, the WAR file of the conference project must be deployed to the server.
  - For example, in the development environment, right-click the **conference project > Run As > Run on server** (a dialog opens)
  - In the dialog, choose **Worklight Development Server**.

## Remote load Android in action

- After the application is installed, click the icon to start the application and authenticate.
- Each view for the IBM Mobile Conference app is loaded through Ajax XHR where each view is generated by the JSP responsible for each distinct view.
- Click the right arrow to transition between the various views.



## Worklight iOS environment

- Ensure that the `OpenAllWhitelistURLsInWebView` setting is set to **true** in the `config.xml` file
  - If this setting is not set to **true**, non-local HTML files are loaded in Safari instead of in the WebView of the application.
- Cordova does not allow the specification of a remote URL on startup: you must tell the WebView to load your remote URL.
- Override this method in your application delegate class (**module452ContainerForAdvancedPages.m**):

```

-(BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
{
    BOOL ret = [super application:application didFinishLaunchingWithOptions:launchOptions];
    [[NSNotificationCenter defaultCenter] addObserver:self selector:@selector(didFinishWLNativeInit:)
        name:@"didFinishWLNativeInit" object:nil];
    return ret;
}

// Use this function to refer to webview
-(void) didFinishWLNativeInit:(NSNotification *)notification
{
    NSURL* remoteURL = [NSURL URLWithString:[self getRemoteURL]];
    NSURLRequest* request = [NSURLRequest requestWithURL:remoteURL];
    [self.viewController.webView loadRequest:request];
}

```

```

//Ensure all required keys are in the plist
if(proto == nil || host == nil || port == nil){
    [NSException raise:@"[Remote Load Initialization Error]" format:@"host, port and protocol are
        all required keys in worklight.plist"];
}
NSString* baseURL = [NSString stringWithFormat:@"%s://%s:%s@", proto, host, port, @"/conference"];
return baseURL;

```

# Remote load iOS in action



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  - IBM Worklight Client APIs
  - IBM Worklight integration
  - Encrypted cache
  - Camera support
- Proxy considerations

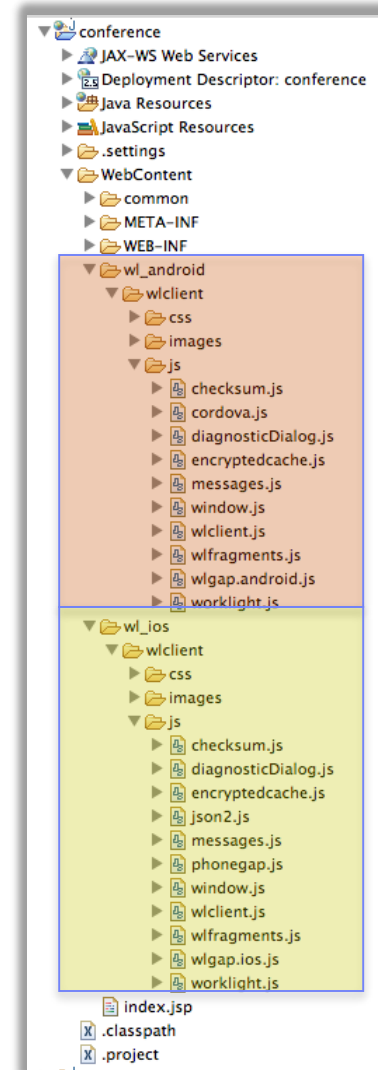
# Extending IBM Mobile Conference app to IBM Worklight Foundation

- IBM Worklight Foundation provides client libraries for hybrid application development.
- Although the APIs are platform-neutral, they are often backed by platform-specific implementations.
- Because the conference app is served remotely, these client-side libraries must be packaged with the conference app.
- Each platform-specific implementation is in its own folder structure in the web application.

```

<c:choose>
  <c:when test="${fn:contains(iOSClient, 'Android')}">
    <link rel="stylesheet" type="text/css"
          href="dojox/mobile/themes/android/android.css"></link>
  </c:when>
  <c:otherwise>
    <link rel="stylesheet" type="text/css"
          href="dojox/mobile/themes/iphone/iphone.css"></link>
  </c:otherwise>
</c:choose>
</head>

```



# IBM Worklight integration

- When the IBM Mobile Conference application completes the authentication process, the mobile device client initializes the device with the server by using `WL.Client.init()`.
- `WL.Client.init` provides a flexible model for application integrity validation, application updates, and other features.

```

WL.StaticAppProps = {
  "APP_DISPLAY_NAME": "ContainerForAdvancedPages",
  "APP_SERVICES_URL": "\apps\services\",
  "APP_VERSION": "1.0",
  "ENVIRONMENT": "android",
  "LOGIN_DISPLAY_TYPE": "embedded",
  "WORKLIGHT_ROOT_URL": "\apps\services\vapi\ContainerForAdvancedPages\android\
};
  
```

```

function(ready, mobile, parser, database, registry, query, photo) {
  function success(){
    console.info('WL init success...');
  }

  function failure(){
    console.info('WL init failure...');
  }

  ready(function(){
    parser.parse();
    WL.Client.init({onSuccess:success, connectOnStartup:false, showLogger:true});
  });

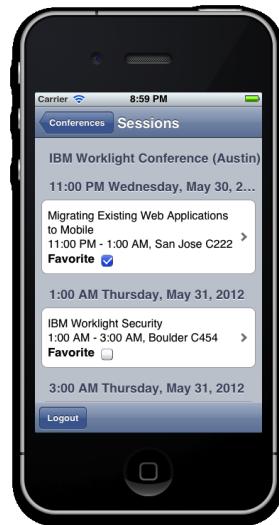
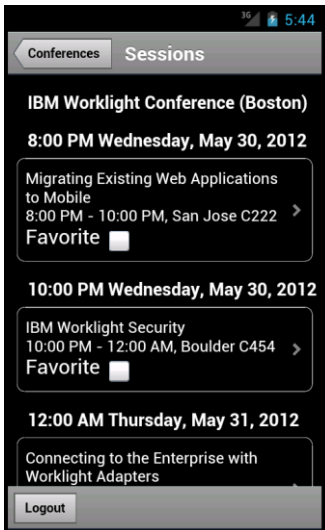
  photo.init();

  var presentersView = registry.byId("presenters");
  dojo.connect(presentersView, "onBeforeTransitionIn", null,
  
```

# Encrypted cache

- The Encrypted Offline Cache (EOC) API is used for securely storing data by using HTML5 local cache.
- The Conference app uses EOC to save a list of favorite sessions in a secure way.

```
function saveToCache(key, value) {
    if (isEOCOpen == false) {
        __openEOC(function() {
            __writeEOC(key, value, function() {
            });
        });
    } else {
        __writeEOC(key, value, function() {
        }, function() {
            alert('Unable to write to Encrypted Offline Cache');
        });
    }
}
```

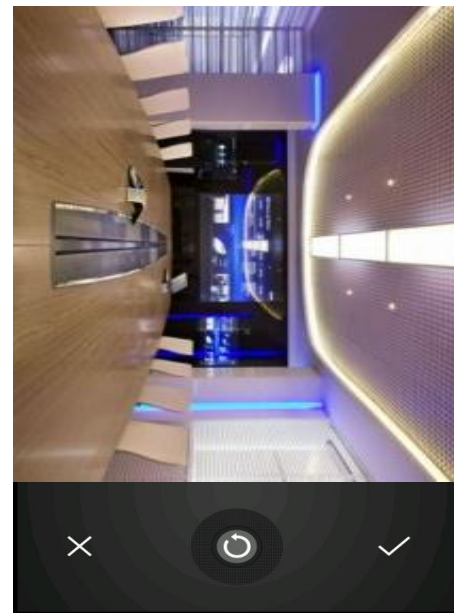
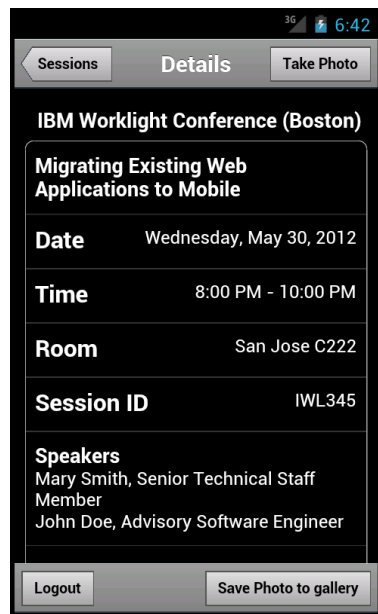


```
function __writeEOC(mykey, mydata, callback) {
    WL.EncryptedCache.write(mykey, mydata, function() {
        callback();
    }, function() {
        alert('an error occurred writing to the EOC');
    });
}
```



## Camera support

- Use the IBM Worklight Client API to extend the application to take photos of the conference.
- The application has a social aspect, where users can view photos from the other conference attendees.



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## Proxy considerations

- IBM Worklight Foundation is compatible with most known proxy solutions.
- WebSphere HTTP Plug-in support
  - Requires single shared `plugin-cfg.xml` for routing requests to both Worklight Server and the WebSphere Application Server that is hosting the IBM Mobile Conference App
- Apache Web Server support
  - Requires mod proxy module to be loaded by web server

```
<IfModule mod_proxy.c>
<Proxy *>
    Order deny,allow
    Allow from all
</Proxy>
## ibm mobile conference app
ProxyPass /conference http://${hostname1}:7080/conference
ProxyPassReverse /conference http://${hostname1}:7080/conference
## Worklight services
ProxyPass /apps http://${hostname2}:8080/apps
ProxyPassReverse /apps http://${hostname2}:8080/apps
</IfModule>
```

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