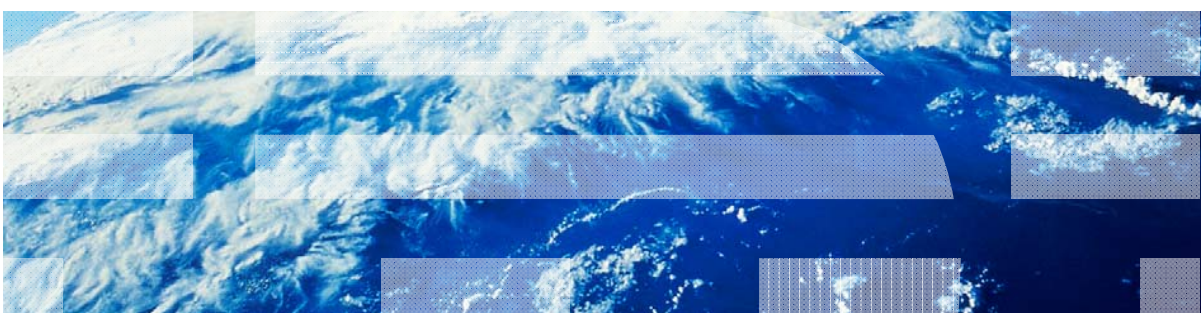
IBM Worklight V6.0.0
Getting Started

Container for advanced pages



12 July 2013

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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.

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Agenda

- Background of IBM Mobile Conference Application
  - Mobile Views
  - Form-based Authentication
- Migrating Applications to IBM Worklight
  - Creating IBM Worklight Projects and Environments
  - Remote Loading – Android
  - Remote Loading – iOS
- Enhancing the IBM Mobile Conference Application
  - IBM Worklight Client APIs
  - IBM Worklight Integration
  - Encrypted Cache
  - Camera Support
- Proxy Considerations

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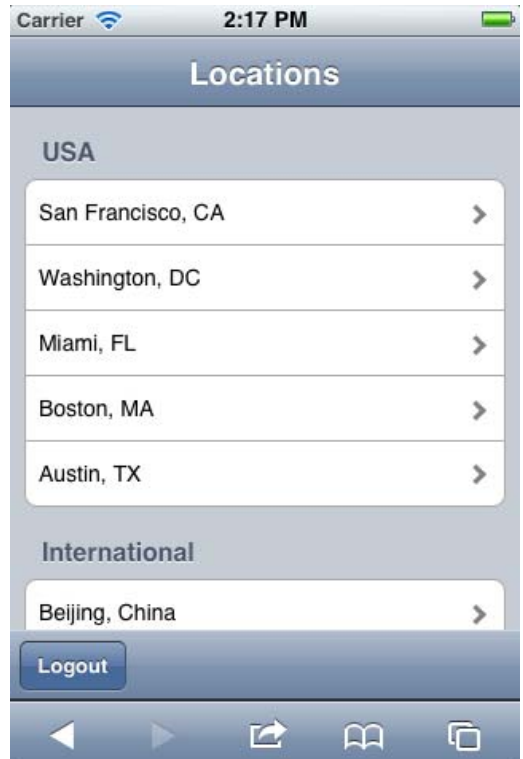
Background

- 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



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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.

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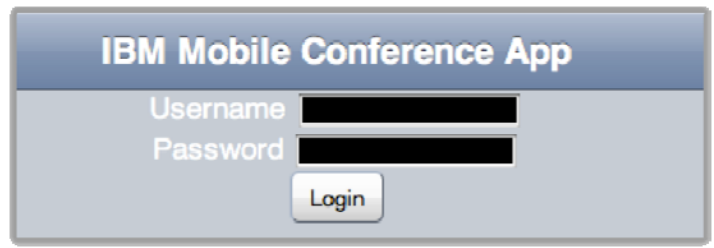
Form-based Authentication Client

- 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>
```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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>
```


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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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Migrating Applications to IBM Worklight®

- 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) added a dimension where the hosting and marketing of these applications made broader-reaching applications less relevant.
- IBM Worklight 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.

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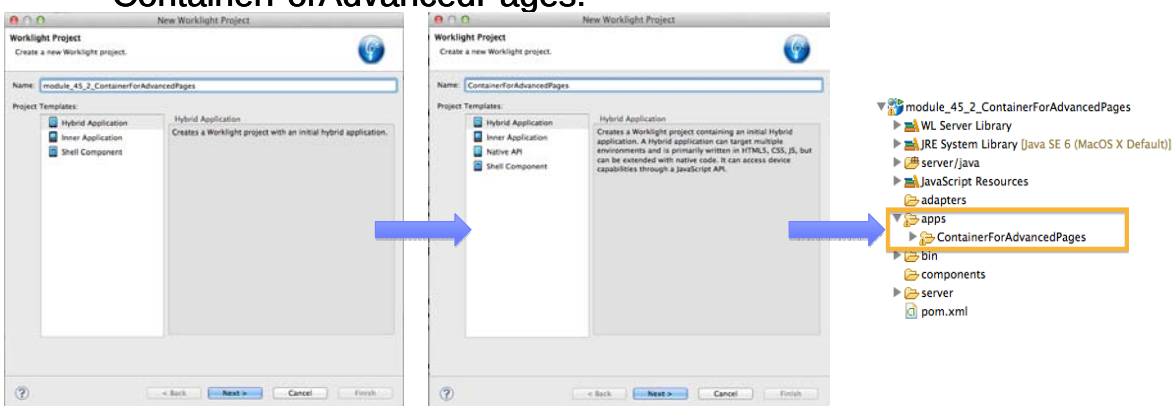
Creating IBM Worklight Applications

- 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.



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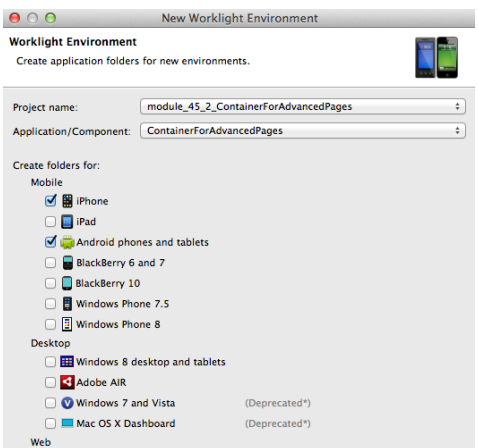
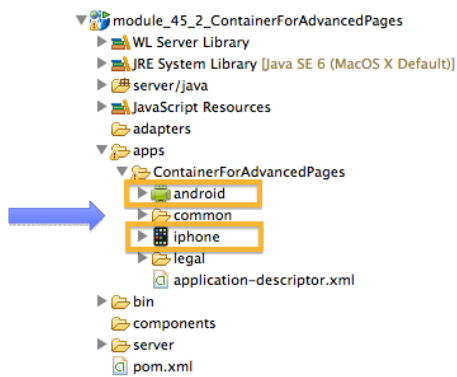
Worklight Environments

- IBM Worklight 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.





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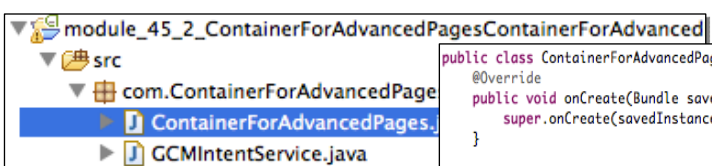
Worklight Android Environment

- 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.




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

    /**s
     * 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
    }
}
```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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 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.

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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

```
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
    }
}
```


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Remote Load Android Code Snippet

- Before running the Worklight application we need to deploy the WAR file of the conference project to the server.
  - For example in the development environment right click the **conference project > Run As > Run on server** (a dialog will be opened)
  - In the dialog choose **Worklight Development Server**.

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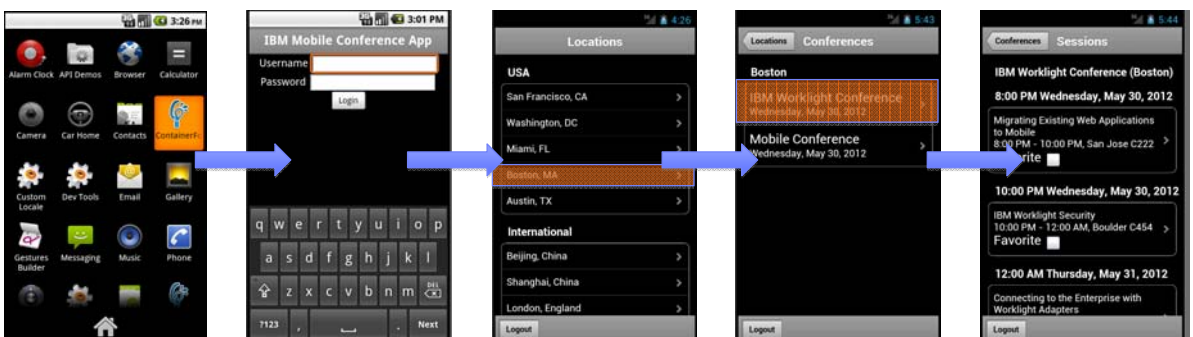
Remote Load Android in Action

- 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.



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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:@"%@://%@:%@%@", proto, host, port, @"/conference"];
return baseURL;
```


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Remote Load iOS in Action

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Extending IBM Mobile Conference App to IBM Worklight

- IBM Worklight provides client libraries for hybrid application development.
- Although the APIs are platform-neutral, there are often platform-specific implementations that are backing those APIs.
- 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>
```

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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\/api\/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,
```


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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');
    });
}
```


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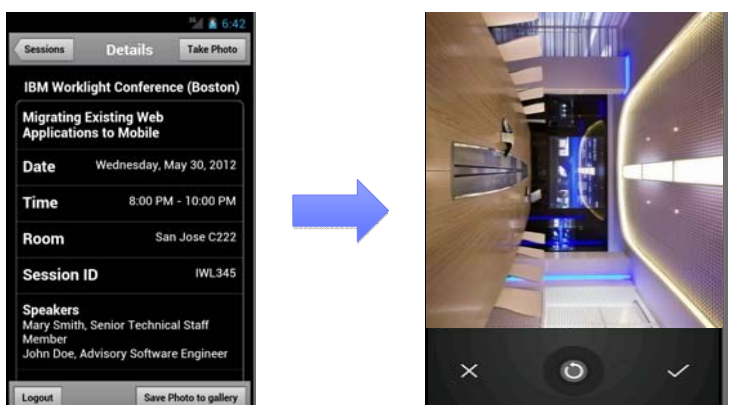
Camera Support

- 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 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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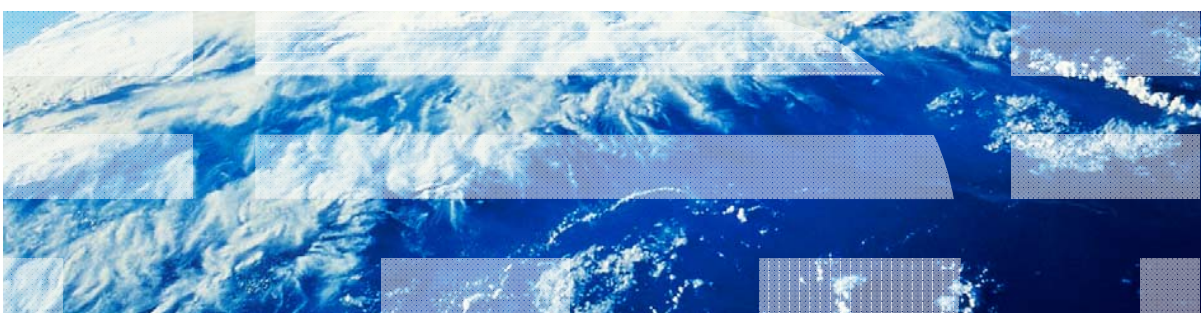

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