

IBM Worklight V6.0.0 Getting Started

Adapter-based authentication



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Agenda

- The Adapter-based authentication introduction
- Configuring the authenticationConfig.xml
- Creating the server-side authentication components
- Creating the client-side authentication components
- Examining the result
- Exercise

The Adapter-based authentication introduction

- The Adapter-based authentication is the most flexible type of authentication to implement and contains all the benefits of the Worklight® Server authentication framework.
- When you use the adapter-based authentication, the entire authentication logic, including the credentials validation, can be implemented in an adapter by using plain JavaScript™.
- Nevertheless, any login module can be used in the adapter-based authentication as an extra authentication layer.
- In this module, you implement an adapter-based authentication mechanism that relies on a user name and a password.

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Configuring the authenticationConfig.xml (1 of 5)

- Add an authentication realm to the <realms> section of the **authenticationConfig.xml** file and call it **AdapterAuthRealm**.

```
<realms>  
  <realm name="AdapterAuthRealm" loginModule="NonValidatingLoginModule" >  
    <className>com.worklight.integration.auth.AdapterAuthenticator</className>  
    <parameter name="login-function" value="AuthAdapter.onAuthRequired"/>  
    <parameter name="logout-function" value="AuthAdapter.onLogout"/>  
  </realm>  
</realms>
```

- This realm uses the **NonValidatingLoginModule** login module that you define later.

Configuring the authenticationConfig.xml (2 of 5)

- Add an authentication realm to the <realms> section of the **authenticationConfig.xml** file and call it **AdapterAuthRealm**.

```
<realms>
  <realm name="AdapterAuthRealm" loginModule="NonValidatingLoginModule" >
    <className>com.worklight.integration.auth.AdapterAuthenticator</className>
    <parameter name="login-function" value="AuthAdapter.onAuthRequired"/>
    <parameter name="logout-function" value="AuthAdapter.onLogout"/>
  </realm>
</realms>
```

- Using the **com.worklight.integration.auth.AdapterAuthenticator** class means that the server-side part of the authenticator is defined in the adapter.

Configuring the authenticationConfig.xml (3 of 5)

- Add an authentication realm to the <realms> section of the **authenticationConfig.xml** file and call it **AdapterAuthRealm**.

```
<realms>
  <realm name="AdapterAuthRealm" loginModule="NonValidatingLoginModule" >
    <className>com.worklight.integration.auth.AdapterAuthenticator</className>
    <parameter name="login-function" value="AuthAdapter.onAuthRequired"/>
    <parameter name="logout-function" value="AuthAdapter.onLogout"/>
  </realm>
</realms>
```

- When the Worklight authentication framework detects an attempt to access a protected resource, an adapter function that is defined in a login-function parameter is invoked automatically.
- When logout is detected (explicit or session timeout), a logout-function is invoked automatically.
- In both cases, the parameter value syntax is **adapterName.functionName**.

Configuring the authenticationConfig.xml (4 of 5)

- Add a login module to the <loginModules> section of the **authenticationConfig.xml** file and call it **NonValidatingLoginModule**.

```
<loginModules>
  <loginModule name="NonValidatingLoginModule">
    <className>com.worklight.core.auth.ext.NonValidatingLoginModule</className>
  </loginModule>
</loginModules>
```

- Using a **NonValidatingLoginModule** class name means that no additional validation is performed by the Worklight Platform, and the developer takes responsibility for the credential validation within the adapter.
- Because all authentication-related actions are done in the adapter code, using **NonValidatingLoginModule** is mandatory for adapter-based authentication.

Configuring the authenticationConfig.xml (5 of 5)

- Add a security test to the <securityTests> section of the **authenticationConfig.xml** file.
- You must use this security test to protect the adapter procedure, so make it a **<customSecurityTest>**.

```
<securityTests>
  <customSecurityTest name="AdapterSecurityTest">
    <test isInternalUserID="true" realm="AdapterAuthRealm"/>
  </customSecurityTest>
</securityTests>
```

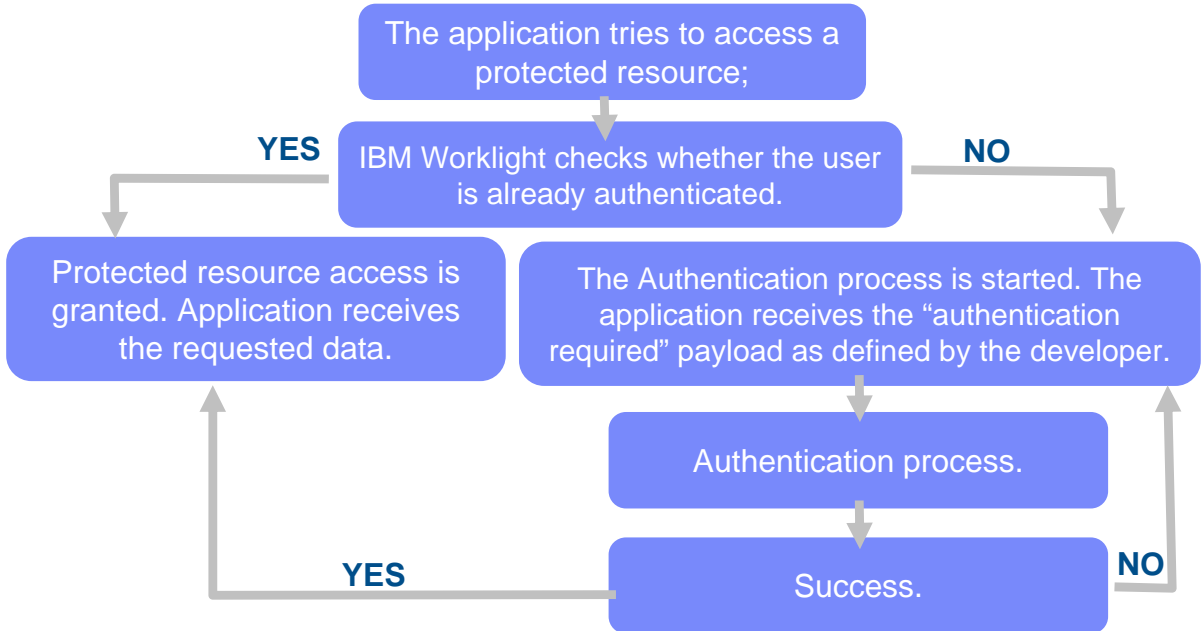
- Remember the security test name. You must use it in subsequent slides.

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Creating the server-side authentication components (1 of 10)

- The following diagram illustrates the adapter-based authentication process:



Creating the server-side authentication components (2 of 10)

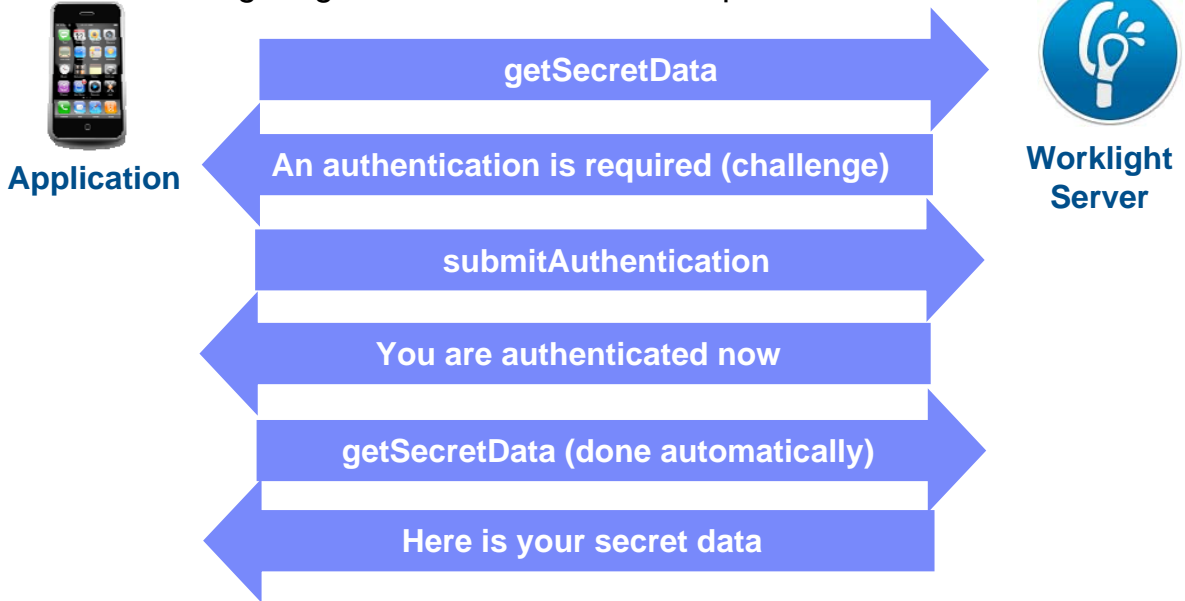
- Create an adapter that takes care of the authentication process. Name it **AuthAdapter**.
- The **AuthAdapter** has two following procedures:

```
<procedure name="submitAuthentication"/>  
<procedure name="getSecretData" securityTest="AdapterSecurityTest"/>
```

- The **submitAuthentication** procedure is taking care of the authentication process and authentication is not required to invoke it.
- The second procedure, however, is available to authenticated users only.

Creating the server-side authentication components (3 of 10)

- The following diagram shows the flow to implement:



Creating the server-side authentication components (4 of 10)

- Whenever the IBM Worklight framework detects an unauthenticated attempt to access a protected resource, the `onAuthRequired` function is invoked (as defined in the **authenticationConfig.xml**).

```
function onAuthRequired(headers, errorMessage) {  
    errorMessage = errorMessage ? errorMessage : null;  
    return {  
        authRequired: true,  
        errorMessage: errorMessage  
    };  
}
```

This object is a custom challenge object that is sent to the application.

- This function receives the response headers and an optional **errorMessage** parameter. The object that is returned by this function is sent to the client application.
- Note the **authRequired: true** property. You use this property in challenge handler to detect that the server is requesting authentication.

Creating the server-side authentication components (5 of 10)

- The **submitAuthentication** function is invoked by a client application to validate user name and password.

```
function submitAuthentication(username, password){  
    if (username === "worklight" && password === "worklight"){  
  
        var userIdentity = {  
            userId: username,  
            displayName: username,  
            attributes: {  
                foo: "bar"  
            }  
        };  
  
        WL.Server.setActiveUser("AdapterAuthRealm", userIdentity);  
  
        return {  
            authRequired: false  
        };  
    }  
  
    return onAuthRequired(null, "Invalid login credentials");  
}
```

The user name and password are received from the application as parameters.

Creating the server-side authentication components (6 of 10)

- The **submitAuthentication** function is invoked by a client application to validate user name and password.

```
function submitAuthentication(username, password){  
    if (username === "worklight" && password === "worklight"){  
        var userIdentity = {  
            userId: username,  
            displayName: username,  
            attributes: {  
                foo: "bar"  
            }  
        };  
        WL.Server.setActiveUser("AdapterAuthRealm", userIdentity);  
        return {  
            authRequired: false  
        };  
    }  
    return onAuthRequired(null, "Invalid login credentials");  
}
```

In this sample, the credentials are validated against some hardcoded values, but any other validation can be performed, for example by using SQL or WebServices.

Creating the server-side authentication components (7 of 10)

- The **submitAuthentication** function is invoked by a client application to validate user name and password.

```
function submitAuthentication(username, password){  
    if (username === "worklight" && password === "worklight"){  
  
        var userIdentity = {  
            userId: username,  
            displayName: username,  
            attributes: {  
                foo: "bar"  
            }  
        };  
  
        WL.Server.setActiveUser("AdapterAuthRealm", userIdentity);  
  
        return {  
            authRequired: false  
        };  
    }  
  
    return onAuthRequired(null, "Invalid login credentials");  
}
```

If validation is successfully passed, a `WL.Server.setActiveUser` API is called to create an authenticated session for the `SingleStepAuthRealm` with a user data stored in a `userIdentity` object. Note, you can add your own custom properties to the user identity attributes.

Creating the server-side authentication components (8 of 10)

- The **submitAuthentication** function is invoked by a client application to validate user name and password.

```
function submitAuthentication(username, password){  
    if (username === "worklight" && password === "worklight"){  
  
        var userIdentity = {  
            userId: username,  
            displayName: username,  
            attributes: {  
                foo: "bar"  
            }  
        };  
  
        WL.Server.setActiveUser("AdapterAuthRealm", userIdentity);  
  
        return {  
            authRequired: false  
        };  
    }  
  
    return onAuthRequired(null, "Invalid login credentials");  
}
```

An object is sent to the application, stating that the authentication screen is no longer required.

Creating the server-side authentication components (9 of 10)

- The **submitAuthentication** function is invoked by a client application to validate user name and password.

```
function submitAuthentication(username, password){  
    if (username === "worklight" && password === "worklight"){  
  
        var userIdentity = {  
            userId: username,  
            displayName: username,  
            attributes: {  
                foo: "bar"  
            }  
        };  
  
        WL.Server.setActiveUser("AdapterAuthRealm", userIdentity);  
  
        return {  
            authRequired: false  
        };  
    }  
    return onAuthRequired(null, "Invalid login credentials");  
}
```

If the credentials validation fails, an object that is built by the `onAuthRequired` function is returned to the application with a corresponding error message.

Creating the server-side authentication components (10 of 10)

- For training purposes, the **getSecretData** function returns a hardcoded value. Keep in mind that the **getSecretData** is protected by a security test, as defined in the adapter XML.
- The **onLogout** function is defined in the **authenticationConfig.xml** file to be invoked automatically on logout (for example to perform a cleanup).

```
5
6 function getSecretData(){
7     return {
8         secretData: "A very very very very secret data"
9     };
10 }
11
12 function onLogout(){
13     WL.Logger.debug("Logged out");
14 }
15
```

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- **Creating the client-side authentication components**
- Examining the result
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Creating the client-side authentication components (1 of 11)

- Create a Worklight application.
- The application consists of two main `<div>` elements:
 - The **`<div id="AppDiv">`** element is used to display the application content.
 - The **`<div id="AuthDiv">`** element is used for authentication form purposes.
- When the authentication is required, the application hides the AppDiv and shows the AuthDiv. When the authentication is complete, it does the opposite.

Creating the client-side authentication components (2 of 11)

- Start by creating an AppDiv.
- It has a basic structure and functions:

```
<div id="AppDiv">
  <div class="header">
    <h1>AdapterAuthApp</h1>
  </div>
  <input type="button" value="Get secret data" onclick="getSecretData()" />
  <input type="button" value="Logout"
    onclick="WL.Client.logout('AdapterAuthRealm', {onSuccess:WL.Client.reloadApp})" />
  <div id="ResponseDiv"></div>
</div>
```

- The buttons are used to invoke the **getSecretData** procedure and to log out.
- The **<div id="ResponseDiv">** is used to display the **getSecretData** response.

Creating the client-side authentication components (3 of 11)

- The AuthDiv contains the following elements:

```
<div id="AuthDiv" style="display:none">  
  <p id="AuthInfo"></p>  
  <hr />  
  <input type="text" placeholder="Enter username" id="AuthUsername"/><br />  
  <input type="password" placeholder="Enter password" id="AuthPassword"/><br />  
  <input type="button" value="Submit" id="AuthSubmitButton" />  
  <input type="button" value="Cancel" id="AuthCancelButton" />  
</div>
```

- The AuthInfo to display error messages.
 - The AuthUsername and the AuthPassword to input elements.
 - The AuthSubmitButton and the AuthCancelButton.
- The AuthDiv is styled as **display:none** because it must not be displayed before the authentication is requested by server.

Creating the client-side authentication components (4 of 11)

- Finally, create a challenge handler.
- Use the following API to create this handler and implement its functionality.

```
var myChallengeHandler = WL.Client.createChallengeHandler("realm-name");  
  
myChallengeHandler.isCustomResponse = function (response){  
    return false;  
};  
  
myChallengeHandler.handleChallenge = function (response){  
};
```

Use the **WL.Client.createChallengeHandler()** to create a challenge handler object. A realm name must be supplied as a parameter.

Create a challenge handler to define a customized authentication flow. In your challenge handler, do not add code that modifies the user interface when this modification is not related to the authentication flow.

Creating the client-side authentication components (5 of 11)

- Finally, create a challenge handler.
- Use the following API to create this handler and implement its functionality.

```
var myChallengeHandler = WL.Client.createChallengeHandler("realm-name");  
myChallengeHandler.isCustomResponse = function (response){  
    return false;  
};  
myChallengeHandler.handleChallenge = function (response){  
};
```

The **isCustomResponse** function of the challenge handler is called each time that a response is received from the server. It is used to detect whether the response contains data that is related to this challenge handler. It returns **true** or **false**.

Creating the client-side authentication components (6 of 11)

- Finally, create a challenge handler.
- Use the following API to create this handler and implement its functionality.

```
var myChallengeHandler = WL.Client.createChallengeHandler("realm-name");  
  
myChallengeHandler.isCustomResponse = function (response){  
    return false;  
};  
  
myChallengeHandler.handleChallenge = function (response){  
};
```

If the `isCustomResponse` returns true, the framework calls the `handleChallenge()` function. This function is used to perform required actions, such as hide the application screen and show the login screen.

Creating the client-side authentication components (7 of 11)

- In addition to the methods that the developer must implement, the challenge handler contains functionalities that the developer might want to use:
 - The **myChallengeHandler.submitAdapterAuthentication()** is used to send collected credentials to a specific adapter procedure. It has the same signature as the **WL.Client.invokeProcedure()** API.
 - The **myChallengeHandler.submitSuccess()** notifies the Worklight framework that the authentication successfully finished. The Worklight framework then automatically issue the original request that triggered the authentication.
 - The **myChallengeHandler.submitFailure()** notifies the Worklight framework that the authentication completed with failure. The Worklight framework then disposes the original request that triggered the authentication.
- You will use these functions during the implementation of the challenge handler in the next slides.

Creating the client-side authentication components (8 of 11)

- Implement the **isCustomResponse** function. It detects whether the server response contains the challenge object that you defined previously.
- You defined challenge object in the adapter. You now use its `authRequired` property.

```
return {  
  authRequired: true,  
  errorMessage: errorMessage  
};
```

```
adapterAuthRealmChallengeHandler.isCustomResponse = function(response) {  
  if (!response || !response.responseJSON || response.responseText === null) {  
    return false;  
  }  
  if (typeof(response.responseJSON.authRequired) !== 'undefined') {  
    return true;  
  } else {  
    return false;  
  }  
};
```

- Return true if the `authRequired` property is found, false otherwise.

Creating the client-side authentication components (9 of 11)

- Implement the **handleChallenge** function. It prepares the authentication UI.
- Use the optional `errorMessage` property of the challenge object.

```
return {  
  authRequired: true,  
  errorMessage: errorMessage  
};
```

```
adapterAuthRealmChallengeHandler.handleChallenge = function(response){  
  var authRequired = response.responseJSON.authRequired;  
  
  if (authRequired == true){  
    $("#AppDiv").hide();  
    $("#AuthDiv").show();  
    $("#AuthPassword").empty();  
    $("#AuthInfo").empty();  
  
    if (response.responseJSON.errorMessage)  
      $("#AuthInfo").html(new Date() + " :: " + response.responseJSON.errorMessage);  
  
  } else if (authRequired == false){  
    $("#AppDiv").show();  
    $("#AuthDiv").hide();  
    adapterAuthRealmChallengeHandler.submitSuccess();  
  }  
};
```

If the `authRequires` is true, it shows login screen, cleans up password field, and shows an `errorMessage` (if present).

Creating the client-side authentication components (10 of 11)

- Implement the handleChallenge function. It prepares the authentication UI.
- Use the optional errorMessage property of the challenge object.

```
return {  
    authRequired: true,  
    errorMessage: errorMessage  
};
```

```
adapterAuthRealmChallengeHandler.handleChallenge = function(response){  
    var authRequired = response.responseJSON.authRequired;  
  
    if (authRequired == true){  
        $("#AppDiv").hide();  
        $("#AuthDiv").show();  
        $("#AuthPassword").empty();  
        $("#AuthInfo").empty();  
  
        if (response.responseJSON.errorMessage)  
            $("#AuthInfo").html(new Date() + " :: " + response.responseJSON.errorMessage);  
    } else if (authRequired == false){  
        $("#AppDiv").show();  
        $("#AuthDiv").hide();  
        adapterAuthRealmChallengeHandler.submitSuccess();  
    }  
};
```

If the authRequired is false, it shows AppDiv, it hides AuthDiv, and it notifies the Worklight framework that the authentication successfully completed.

Creating the client-side authentication components (11 of 11)

- Clicking a login button triggers the function that collects the user name and the password from the HTML input fields, and submits them to the adapter.
- Notice that the challenge handler the **submitAdapterAuthentication** method is used.

```
$("#AuthSubmitButton").bind('click', function () {  
    var username = $("#AuthUsername").val();  
    var password = $("#AuthPassword").val();  
  
    var invocationData = {  
        adapter : "AuthAdapter",  
        procedure : "submitAuthentication",  
        parameters : [ username, password ]  
    };  
  
    adapterAuthRealmChallengeHandler.submitAdapterAuthentication(invocationData, {});  
});
```

- There is no requirement to specify the callbacks because the response is checked by the Worklight framework.

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Examining the result

The image displays three overlapping screenshots of a web application titled "AdapterAuthApp".

The leftmost screenshot shows the application's main interface with two buttons: "Get secret data" and "Logout".

The middle screenshot, which is partially obscured by the others, shows a login form with the following elements:

- Input field: "Enter username"
- Input field: "Enter password"
- Button: "Submit"

The rightmost screenshot shows the application's response after a successful login, displaying a JSON object:

```
{ "responseID": "7", "isSuccessful": true, "secretData": "very very very very secret data" }
```

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Exercise

- Implement the adapter authentication as described in this training module
- The sample for this training module can be found in the **Getting Started** page of the IBM® Worklight documentation website at <http://www.ibm.com/mobile-docs>

Check yourself questions

- When you define a realm that is using an adapter-based authentication in the authenticationConfig.xml, which two parameters are mandatory?
 - The login-function, the logout-function.
 - The adapter-name, the realm-name.
 - The adapter-name, the login-function.
 - The login-function, the login-module.
- How can a developer specify which adapter procedures are protected by an authentication realm?
 - When the authentication realm is specified in the adapter XML file, all the adapter procedures are protected by it.
 - The developer does not have to specify it. Authentication credentials are added on the client side when you use WL.Client.invokeProcedure for the procedure to work.
 - By adding a securityTest property to the procedure definition in the adapter XML.
 - You cannot protect the adapter procedures by an authentication realm. The protection is for applications only.
- What client side mechanism is used to detect that the server requires an authentication for the client request?
 - The challengeHandler.isAuthenticationRequired
 - The challengeHandler.isUserAuthenticated
 - The challengeHandler.analyzeServerResponse
 - The challengeHandler.isCustomResponse

Check yourself questions

- When you define a realm that is using an adapter-based authentication in the authenticationConfig.xml, which two parameters are mandatory?
 - The login-function, the logout-function.
 - The adapter-name, the realm-name.
 - The adapter-name, the login-function.
 - The login-function, the login-module.
- How can a developer specify which adapter procedures are protected by an authentication realm?
 - When the authentication realm is specified in the adapter XML file, all the adapter procedures are protected by it.
 - The developer does not have to specify it. Authentication credentials are added on the client side when you use WL.Client.invokeProcedure for the procedure to work.
 - By adding a securityTest property to the procedure definition in the adapter XML.
 - You cannot protect the adapter procedures by an authentication realm. The protection is for applications only.
- What client side mechanism is used to detect that the server requires an authentication for the client request?
 - The challengeHandler.isAuthenticationRequired
 - The challengeHandler.isUserAuthenticated
 - The challengeHandler.analyzeServerResponse
 - The challengeHandler.isCustomResponse

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