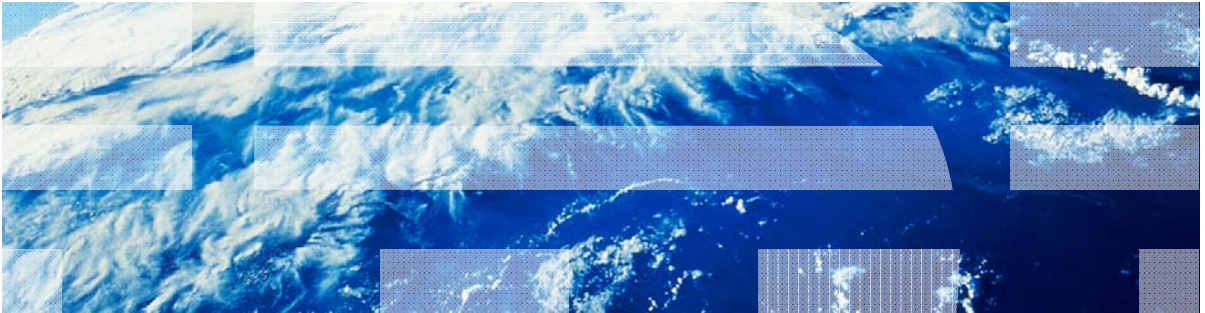


IBM Worklight V5.0.6 Getting Started

Authentication concepts



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Agenda

- Authentication concepts and entities
- Defining realms, authenticators, and login modules
- Defining security tests
- Protecting applications
- Protecting adapters
- Protecting static resources
- What's next

Authentication concepts and entities

- IBM Worklight® entities such as applications, adapter procedures, and static resources can be protected from unauthorized access.
- Entity protection rules are defined by a **security test** that contains one or more *authentication realms*.
- An **authentication realm** defines the process to be used to authenticate users.
- Each authentication realm consists of **Authenticator** and **Login Module** server side components.
- The same authentication realm can be used to protect several resources.
- Each authentication realm requires a **challenge handler** component to be present on a client side
- Detailed definitions of all authentication components are given on later slides.

Authentication concepts and entities

Authenticator

- An authenticator is a server-side entity responsible for collecting the credentials from the client application.
- An authenticator can collect any type of information accessible from an HTTP request object – cookies, headers, body, or any other properties.
- The Worklight server comes with a set of predefined authenticators, including:
 - A form-based authenticator that returns a challenge in the form of an HTML login form, making it useful for web environments as well as mobile applications.
 - An adapter-based authenticator that uses the Worklight adapter procedure to collect and validate the credentials from the client application.
 - A header-based authenticator that does not require interactive credentials collection, but will check the specific HTTP header instead.
- In addition to predefined authenticators, you can create your own custom authenticator by using the Java™ code.

Authentication concepts and entities

Login modules

- A login module is a server-side entity responsible for verifying the user credentials, and for creating a *user identity* object which holds the user properties for the remainder of the session.
- The credentials validation can be done, for example, in one of the following ways:
 - By using a web service.
 - By looking up the user in a users table in a database.
 - By using the WebSphere® LTPA token.
- It is possible to add custom user properties according to the enterprise needs.
- A login module destroys the user identity object when the authenticated session terminates (logout or timeout).
- A login module can be configured to automatically record login attempts for audit purposes.
- In addition to predefined login modules, you can create your own custom login module by using the Java code.

Authentication concepts and entities

Authentication realms

- An authentication realm is a combination of one authenticator and one login module.
- Each authentication realm defines its authentication flow:
 - What should happen after the authentication process is triggered?
 - What is the form of challenge that should be sent to the client application?
 - Which credentials should be collected?
 - How and when should credentials be collected?
 - How should credentials be sent to server?
 - How should credentials be validated by server?
 - What will be the result of the credentials validation?
 - What will be the properties of the user identity object?
- Worklight provides several predefined authentication realms for security features, such as a remote application disable, or an application authenticity.
- Each authentication realm that is defined in the server authentication configuration should have a corresponding challenge handler in the client application.

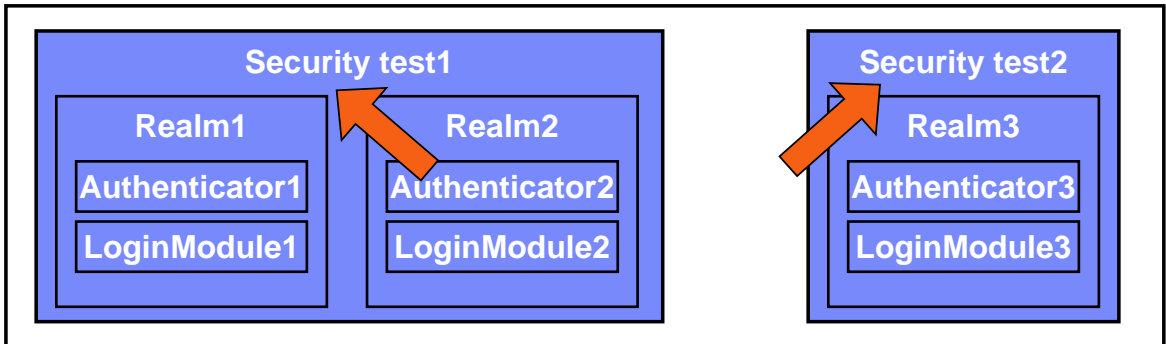
Authentication concepts and entities

Security tests

- A security test is an ordered set of authentication realms that is used to protect a resource such as an adapter procedure, an application, or a static URL.
- A security test defines the realms that the user must authenticate against in order to get access to the protected resource.
- A developer can define the order in which the authentication should be performed (for example: the request authentication in realm2 only after the realm1 authentication succeeds).
- The IBM Worklight framework provides default security tests definitions for mobile and web environments as well as the ability to create custom security tests.
 - More in the following slides

Authentication concepts and entities

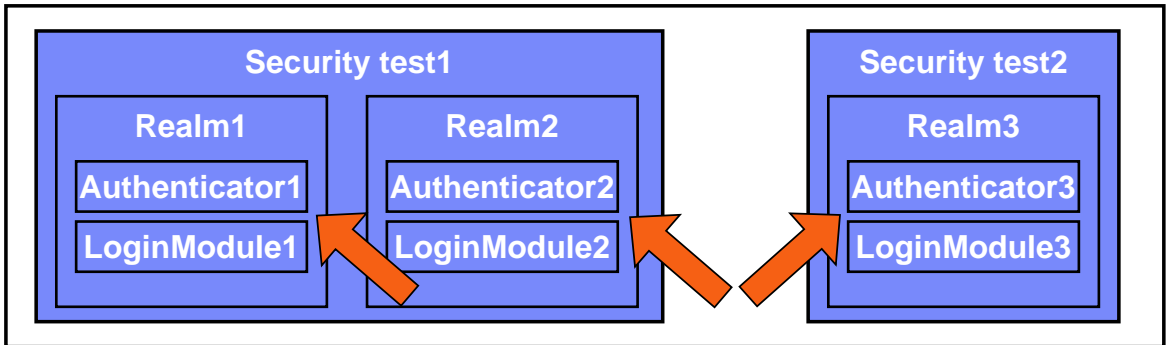
- Sample security configuration



- A resource, e.g. application or adapter procedure, can be protected by either of two security tests
- Using Security test 1 means user will have to authenticate in both Realm1 and Realm2, each one with its own set of rules
- Using Security test 2 means user need to authenticate in Realm3 only

Authentication concepts and entities

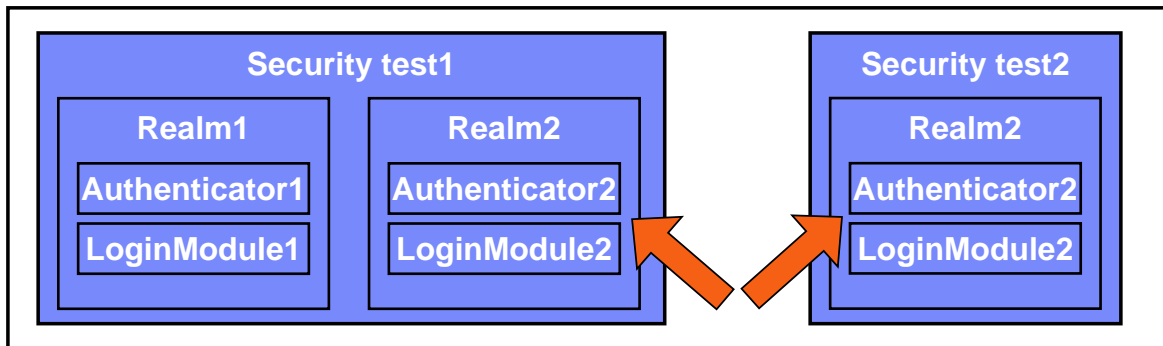
- Sample security configuration



- Each realm defines its own set of Authenticator and Login Module
- This means that each realm has its own rules for collecting credentials and validating them

Authentication concepts and entities

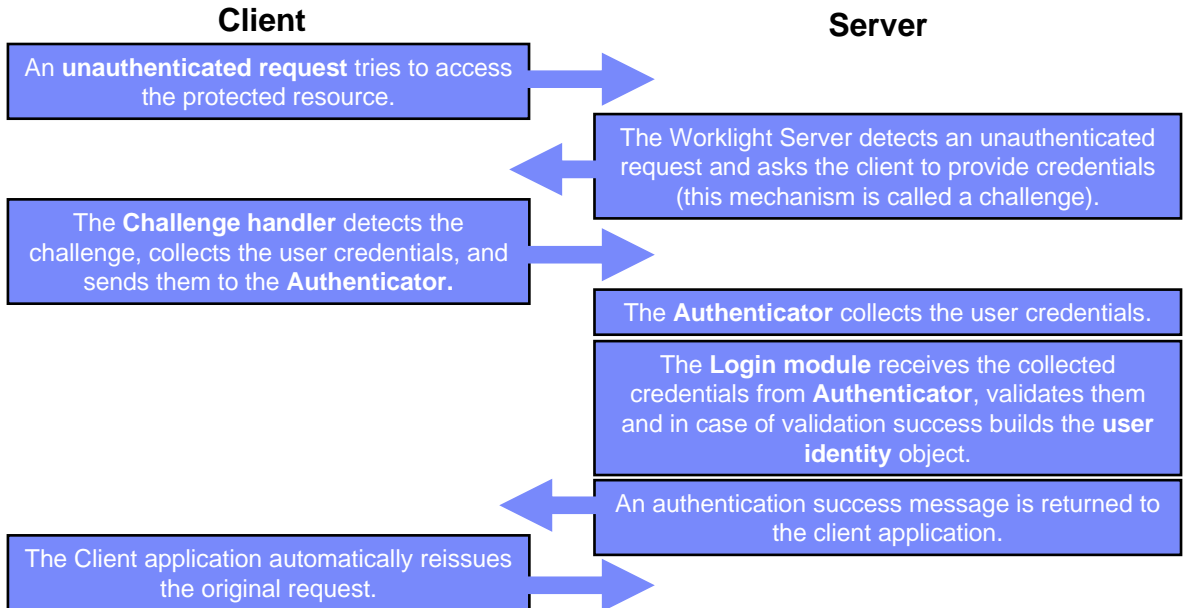
- Sample security configuration



- Realms, authenticators and login modules can be reused
- Note that on an updated configuration above Realm2 is reused
- Protecting a resource with Security test1 means a need to authenticate in both Realm1 and Realm2
- Protecting a resource with Security test2 means a need to authenticate in Realm2 only

Authentication concepts and entities

- When a request is made to the protected entity, Worklight checks whether the session is already authenticated. If not, Worklight automatically triggers a process to verify the user's identity.



Authentication concepts and entities

Challenge handler

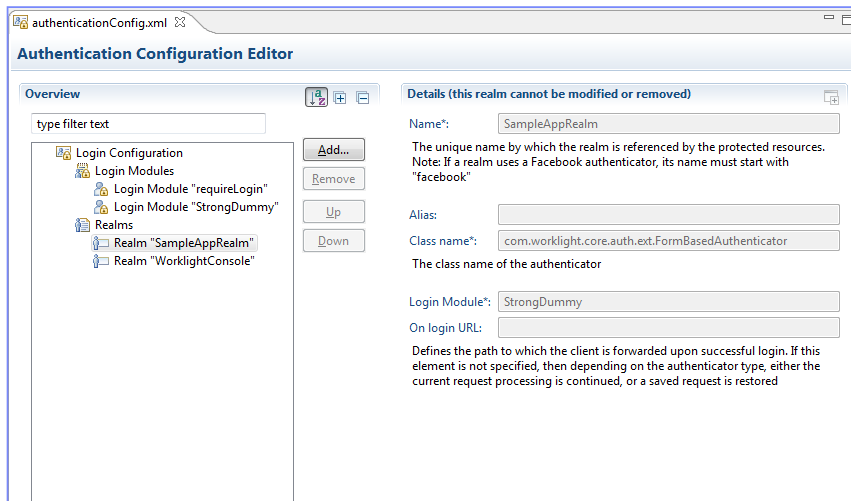
- A challenge handler is a client side entity that controls the authentication process. It is used to detect the authentication challenges in the server responses and handle them.
- A separate challenge handler instance should be created for each realm application that needs to authenticate in.
- A challenge handler can be used to detect and handle both the Worklight-related and the external authentication challenges, like the authentication proxies and the gateways.
- After a challenge handler detects an authentication challenge that is returned from the server, it is responsible for collecting the required credentials and for sending them back to the server.
- After the authentication flow completes, the challenge handler can send a notification back to the Worklight framework about the authentication success or failure.
- Though customizable, a challenge handler is created with a preset of methods that you can use to submit the credentials to the built-in user authentication types of the Worklight Server.

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Defining realms, authenticators, and login modules

- Authentication settings are configured in the **server/conf/authenticationConfig.xml** file of the project.
- You can modify them by using the Authentication Configuration Editor.



Defining realms, authenticators, and login modules

- Authentication settings are configured in the **server/conf/authenticationConfig.xml** file of the project.
- You can modify them by using the Authentication Configuration Editor.

```
<realms>
  <realm loginModule="StrongDummy" name="SampleAppRealm">
    <className>com.worklight.core.auth.ext.FormBasedAuthenticator</className>
  </realm>
  <realm loginModule="requireLogin" name="WorklightConsole">
    <className>com.worklight.core.auth.ext.FormBasedAuthenticator</className>
    <onLoginUrl>/console</onLoginUrl>
  </realm>
</realms>

<loginModules>
  <loginModule name="StrongDummy">
    <className>com.worklight.core.auth.ext.NonValid
  </loginModule>

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

Each realm has a name, a loginModule specification, a className of an authenticator implementation and optional parameters.

Defining realms, authenticators, and login modules

- Authentication settings are configured in the **server/conf/authenticationConfig.xml** file of the project.
- You can modify them by using the Authentication Configuration Editor.

```
<realms>
  <realm loginModule="StrongDummy" name="SampleAppReal"
    <className>com.worklight.core.auth.ext.FormBase
  </realm>
  <realm loginModule="requireLogin" name="WorklightCo
    <className>com.worklight.core.auth.ext.FormBase
    <onLoginUrl>/console</onLoginUrl>
  </realm>
</realms>

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

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

Each login module has a name, a className of the implementation and optional parameters.

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Defining security tests

- The IBM Worklight platform allows setting up multiple realms for a security test.
- As a part of the security test setup, you must tell IBM Worklight which of the realms are considered a “user realm” and a “device realm”.
- An identity that is taken from a realm that is defined as a “user realm” will be used by IBM Worklight as a user identity for features that require one, such as the push notification or the application usage reports.
- An identity that is taken from a realm that is defined as a “device realm” will be used by IBM Worklight as a device identity for features that require one, such as the device provisioning, the push notification, and the SMS notification.

Defining security tests

- After you set up your authentication realms, you must define the security tests to be used to protect your applications, adapter procedures, and static resources.
- There are three types of security tests that can be defined in the **authenticationConfig.xml** file:
 - The **webSecurityTest** – a test that has default web security-related realms enabled.
 - The **mobileSecurityTest** – a test that has default mobile security-related realms enabled.
 - The **customSecurityTest** – a custom security test. Does not contain any default realm.

Defining security tests - `webSecurityTest`

- The **`webSecurityTest`** should be used to protect web applications.
- By default the **`webSecurityTest`** includes a protection against XSRF attacks (see the IBM Worklight user documentation).
- Each **`webSecurityTest`** must contain one **`<testUser>`** element with a realm definition.
- This realm will be considered a user realm.

```
<webSecurityTest name="SampleWebSecurityTest">  
  <testUser realm="SampleRealm"/>  
</webSecurityTest>
```

Defining security tests - mobileSecurityTest

- The **mobileSecurityTest** should be used to protect mobile applications.
- By default the **mobileSecurityTest** includes:
 - A protection against XSRF attacks (see the IBM Worklight user documentation).
 - An application authenticity test (see the IBM Worklight user documentation).
 - An ability to remotely disable mobile application from the Worklight console.
- Each **mobileSecurityTest** must contain one **<testUser>** element with realm definition.

- This realm

```
<mobileSecurityTest name="SampleMobileSecurityTest">  
  <testUser realm="SampleRealm"/>  
</mobileSecurityTest>
```

Defining security tests - `customSecurityTest`

- The **`customSecurityTest`** can be used to dictate your own security preferences.
- Unlike the mobile and web security tests, the **`customSecurityTest`** does not include any predefined authentication realms, only the ones that are defined by a developer.
- Any number of tests can be defined within the **`customSecurityTest`**.
- It is possible to define which realm to be used as a user realm by adding the **`isInternalUserId="true"`** property.
- It is possible to define the order of realms that the user must authenticate in.

```
<customSecurityTest name="SampleCustomSecurityTest">  
  <test realm="SampleRealm1" step="1" />  
  <test realm="SampleRealm2" step="2"/>  
  <test realm="SampleRealm2" isInternalUserID="true" step="3"/>  
</customSecurityTest>
```

Agenda

- Authentication concepts and entities
- Defining realms, authenticators, and login modules
- Defining security tests
- **Protecting applications**
- Protecting adapters
- Protecting static resources
- What's next

Protecting applications

- Protecting an application means that an authentication will be required immediately once the application tries to connect to the Worklight server.
- A separate **securityTest** can be defined for each application environment in the **application-descriptor.xml** file.

```
<common securityTest="SampleWebSecurityTest"/>
<android version="1.0" securityTest="SampleMobileSecurityTest">
  <worklightSettings include="true"/>
  <pushSender key="a" senderId="b"/>
    <security>
      <encryptWebResources enabled="true"/>
      <testWebResourcesChecksum enabled="true"/>
    </security>
  </android>
```

- If no **securityTest** is defined for a specific environment, only a minimal set of default platform tests will be performed.

Agenda

- Authentication concepts and entities
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- Defining security tests
- Protecting applications
- **Protecting adapters**
- Protecting static resources
- What's next

Protecting adapters

- Protecting an adapter procedure means that an authentication will be required when this adapter procedure is invoked by a client application.
- A separate **securityTest** can be defined for each adapter procedure in the adapter XML file.

```
<wl:adapter xmlns:wl="http://www.worklight.com/integration" xmlns:http="http://w  
  
  <displayName>DummyAdapter</displayName>  
  <description>DummyAdapter</description>  
  <connectivity>  
    <connectionPolicy xsi:type="http:HTTPConnectionPolicyType">  
      <protocol>http</protocol>  
      <domain>rss.cnn.com</domain>  
      <port>80</port>  
    </connectionPolicy>  
    <loadConstraints maxConcurrentConnectionsPerNode="2"/>  
  </connectivity>  
  
  <procedure name="getSecretData" securityTest="DummyAdapter-securityTest"/>  
  
</wl:adapter>
```

Agenda

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- Protecting applications
- Protecting adapters
- **Protecting static resources**
- What's next

Protecting static resources

- A static resource is a URL loaded from a Worklight server:
 - For example: the Worklight console or mobile web application.
- Protecting a static resource means that the Worklight server will require authentication when an attempt to browse to the specified URL is made.
- The static resources and their protection can be defined in the **authenticationConfig.xml** file.

```
<staticResources>  
  <resource id="worklightConsole" securityTest="worklightConsoleSecurityTest">  
    <urlPatterns>/console*</urlPatterns>  
  </resource>  
</staticResources>
```

Agenda

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What's next

- In the following modules, you will implement several authentication types:
 - Form-based authentication
 - Adapter-based authentication
 - Custom Java authenticator and a login module
 - LDAP login module
 - LPTA token in the WebSphere Application Server
- See the IBM Worklight user documentation for more details about the authentication.

Check yourself questions

- The difference between an Authenticator and a Login module is:
 - An Authenticator is a server-side entity that is used to collect and validate credentials. A Login module is a server-side entity that is used to create a userIdentity.
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 - An Authenticator is a server-side entity that is used to collect credentials. A Login module is a server-side entity that is used to validate credentials and create a user identity.
 - An Authenticator is a client side entity that performs basic credentials validation. A Login module is a server-side entity which performs deep credentials validation.
- A developer created two adapter procedures. Each procedure is protected by its own security test with different realms. What would be the consequence of this approach?
 - When a user authenticates in one realm, that user will be automatically authenticated in a second one.
 - A user will not be able to use these procedures together in the same application.
 - A user will have to log in to each realm separately.
 - A user will have to log out from one realm before that user can use a procedure protected by another realm.
- What is the dependency between realm, authenticator and login module in the authenticationConfig.xml file?
 - Each authenticator element must specify its className, realm, and loginModule.
 - Each realm element must specify a className of its authenticator and a loginModule name.
 - Each loginModule element must specify a className of its realm and an authenticator name.
 - Each authenticator element must specify its realm and its loginModule.

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