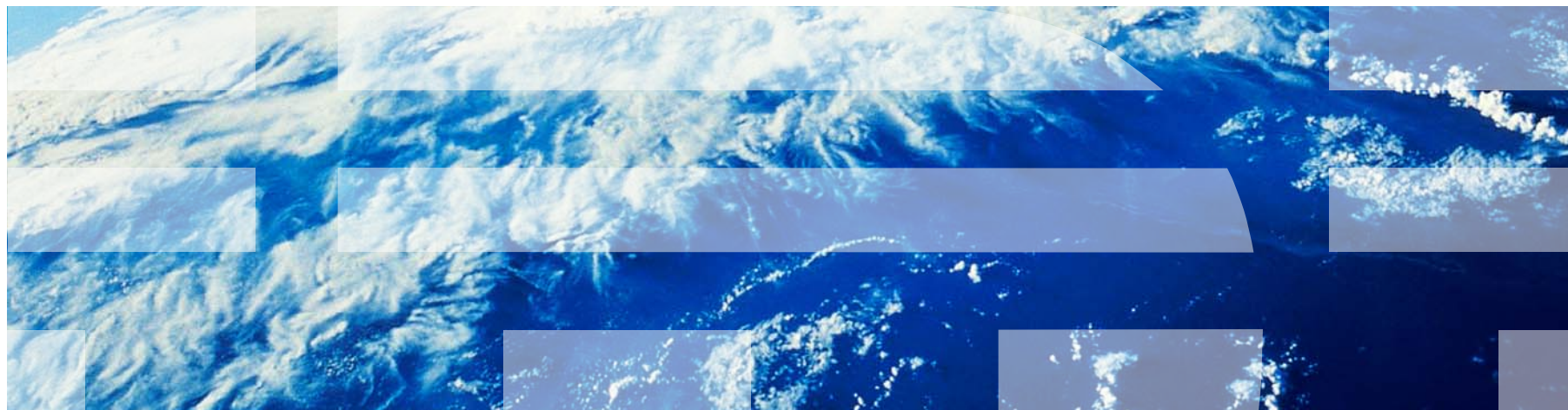


# ***IBM Worklight V6.1.0 Getting Started***

## **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 is next
- Check yourself questions

## ***Authentication concepts and entities (1 of 10)***

- 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 an **Authenticator** and a **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 the client-side
- Detailed definitions of all authentication components are given on later slides.

## ***Authentication concepts and entities (2 of 10)***

### ***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.
- 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 and 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 checks 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 (3 of 10)***

## ***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 (4 of 10)***

## ***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 the server?
  - How should credentials be validated by the 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 (5 of 10)***

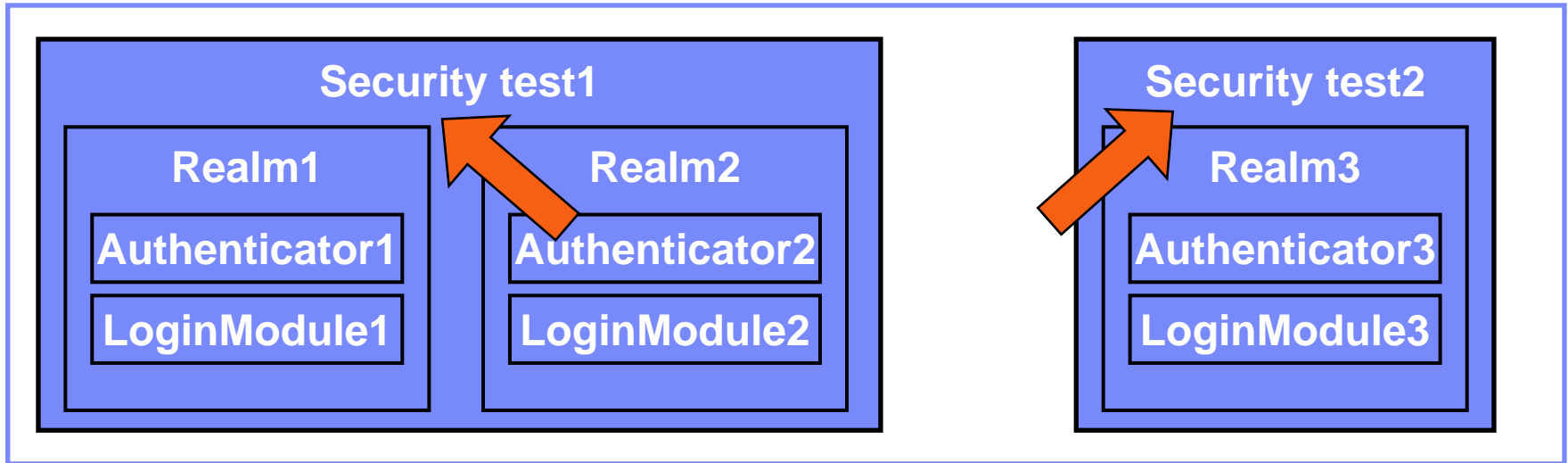
### ***Security tests***

- 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 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, and the ability to create custom security tests.
  - More in the following slides



## Authentication concepts and entities (6 of 10)

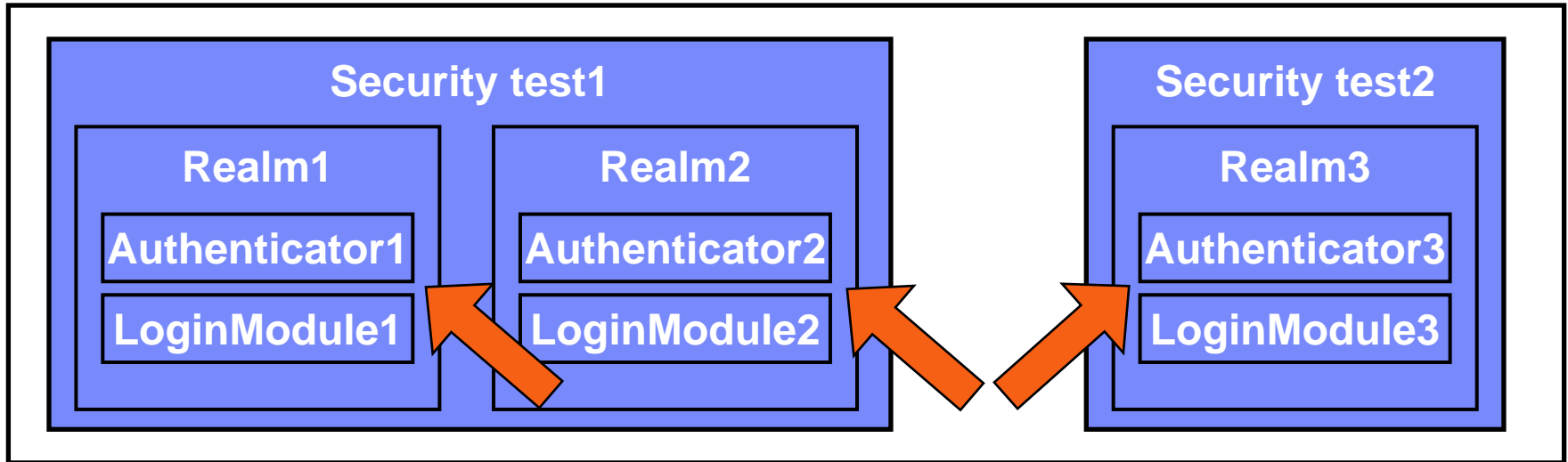
- Sample security configuration



- A resource, for example, an application or adapter procedure, can be protected by either of two security tests.
- Using Security test 1 means that the user must authenticate in both Realm1 and Realm2, each one with its own set of rules.
- Using Security test 2 means user must authenticate in Realm3 only.

## Authentication concepts and entities (7 of 10)

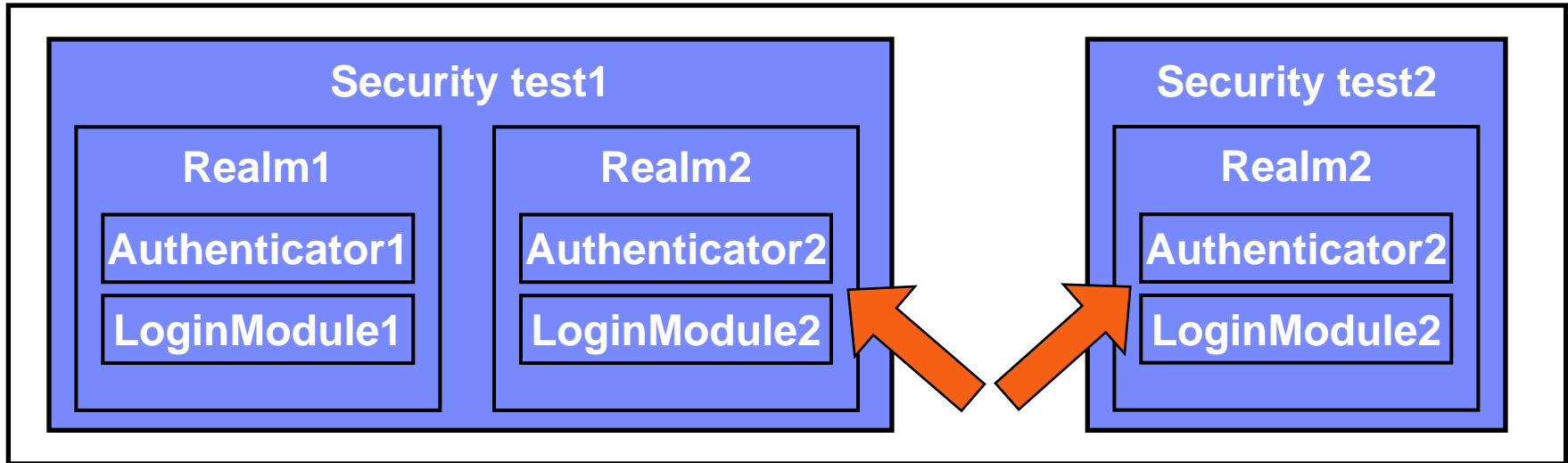
- Sample security configuration



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

## Authentication concepts and entities (8 of 10)

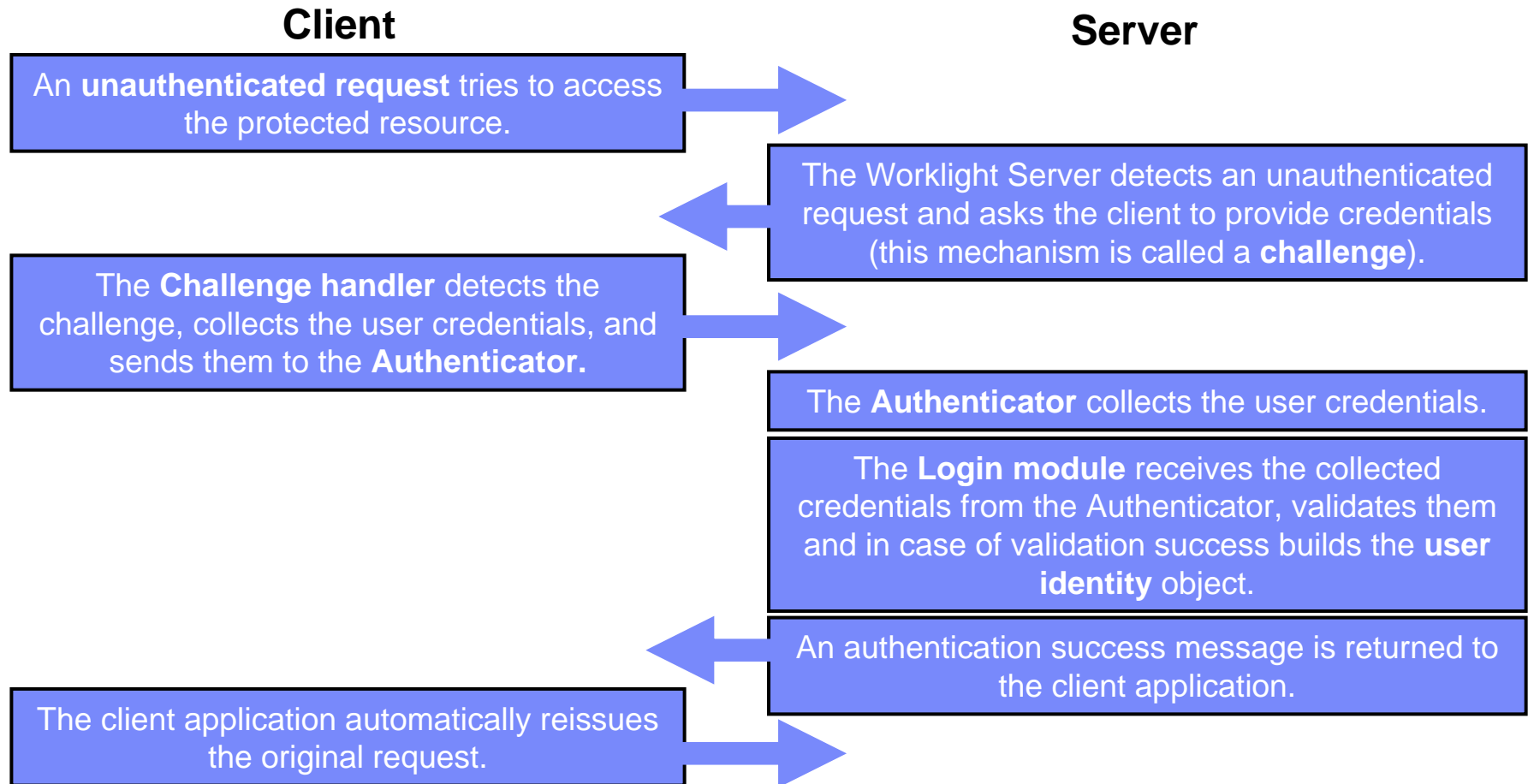
- Sample security configuration



- Realms, authenticators, and login modules can be reused.
- On an updated configuration above, Realm2 is reused.
- Protecting a resource with Security test1 means a must authenticate in both Realm1 and Realm2.
- Protecting a resource with Security test2 means a must authenticate in Realm2 only.

## Authentication concepts and entities (9 of 10)

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



# ***Authentication concepts and entities (10 of 10)***

## ***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 that the application must 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.

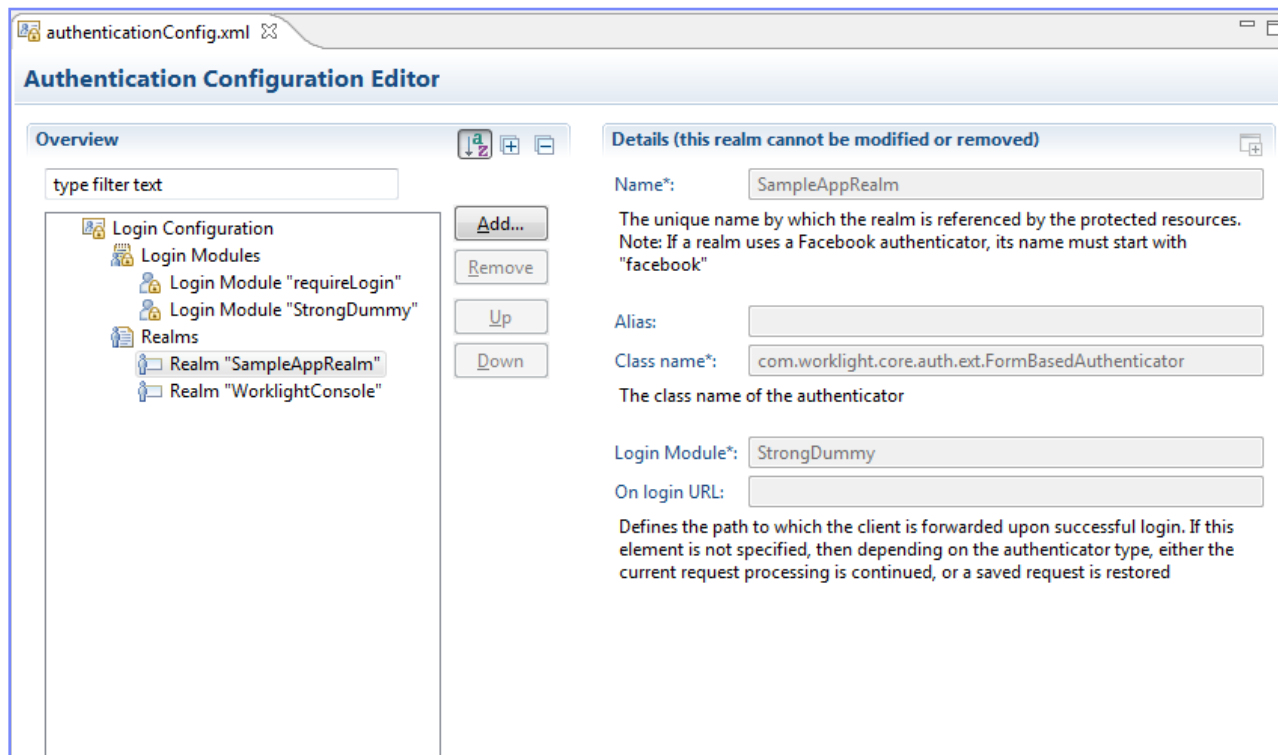
***Create a challenge handler to define a customized authentication flow. In your challenge handler, do not add code that modifies the user interface when this modification is not related to the authentication flow.***

# Agenda

- Authentication concepts and entities
- Defining realms, authenticators and login modules
- Defining security tests
- Protecting applications
- Protecting adapters
- Protecting static resources
- What is next
- Check yourself questions

# Defining realms, authenticators and login modules (1 of 3)

- Authentication settings are configured in the Worklight project in the `server\conf\authenticationConfig.xml` file.
- You can modify them by using the Authentication Configuration Editor.



## Defining realms, authenticators and login modules (2 of 3)

- Authentication settings are configured in the Worklight project in the `server\conf\authenticationConfig.xml` file.
- 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 (3 of 3)

- Authentication settings are configured in the Worklight project in the `server\conf\authenticationConfig.xml` file.
- You can modify them by using the Authentication Configuration Editor.

```
<realms>
  <realm loginModule="StrongDummy" name="SampleAppRea
    <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.

# *Agenda*

- Authentication concepts and entities
- Defining realms, authenticators and login modules
- **Defining security tests**
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## *Defining security tests (1 of 5)*

- With IBM Worklight, you can set up multiple realms for a security test.
- As a part of the security test setup, you must tell IBM Worklight about which 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** is used by IBM Worklight as a **user identity** for features that require one, such as the push notifications or the application usage reports.
- An identity that is taken from a realm that is defined as a **device realm** is used by IBM Worklight as a **device identity** for features that require one, such as the device provisioning, push notifications and SMS notifications.

## *Defining security tests (2 of 5)*

- 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.
- Three types of security tests can be defined in the **authenticationConfig.xml** file:
  - **webSecurityTest** – a test that has default web security-related realms enabled.
  - **mobileSecurityTest** – a test that has default mobile security-related realms enabled.
  - **customSecurityTest** – a custom security test. Does not contain any default realm.

## Defining security tests (3 of 5)

### *webSecurityTest*

- Use the **webSecurityTest** to protect web applications.
- By default the **webSecurityTest** includes a protection against XSRF attacks (for more on this topic, see the IBM Worklight user documentation).
- Each **webSecurityTest** must contain one **<testUser>** element with a realm definition.
- This realm is considered a **user realm**.

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

## Defining security tests (4 of 5)

### *mobileSecurityTest*

- Use the **mobileSecurityTest** to protect mobile applications.
- By default the **mobileSecurityTest** includes:
  - A protection against XSRF attacks
  - An application authenticity test (for more on this topic, 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 is considered a **user realm**.

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

## Defining security tests (5 of 5)

### *customSecurityTest*

- Use the **customSecurityTest** 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 the developer.
- Any number of tests can be defined within the **customSecurityTest**.
- You can define which realm to be used as a user realm by adding the **isInternalUserId="true"** property.
- You can 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 is next
- Check yourself questions



## Protecting applications

- Protecting an application means that authentication is required immediately when 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 are carried out.

# Agenda

- Authentication concepts and entities
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- Defining security tests
- Protecting applications
- **Protecting adapters**
- Protecting static resources
- What is next
- Check yourself questions

## Protecting adapters

- Protecting an adapter procedure means that authentication is 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***

- Authentication concepts and entities
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- Protecting adapters
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- What is next
- Check yourself questions

## Protecting static resources

- A static resource is a URL loaded from the Worklight Server:
  - For example: the Worklight Console or Mobile Web application.
- Protecting a static resource means that the Worklight server requires 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 is next**
- Check yourself questions

## *What is 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 authentication in Worklight.

# ***Agenda***

- Authentication concepts and entities
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## Check yourself questions (1 of 2)

- 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.
  - An Authenticator is a server-side entity that is used to collect credentials and create a user identity. A Login module is a server-side entity that is used to validate credentials.
  - 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 that 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 that is 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.

## Check yourself questions (2 of 2)

- 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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  - 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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