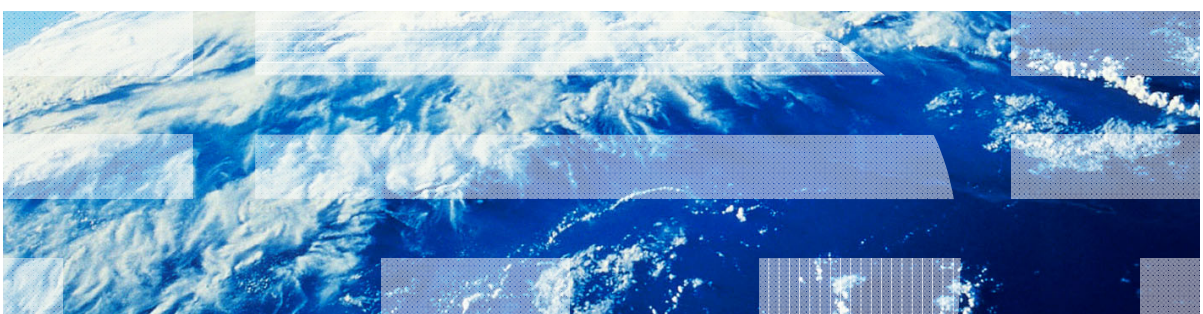
IBM Worklight V5.0.5 Getting Started

Module 20 – Authentication concepts



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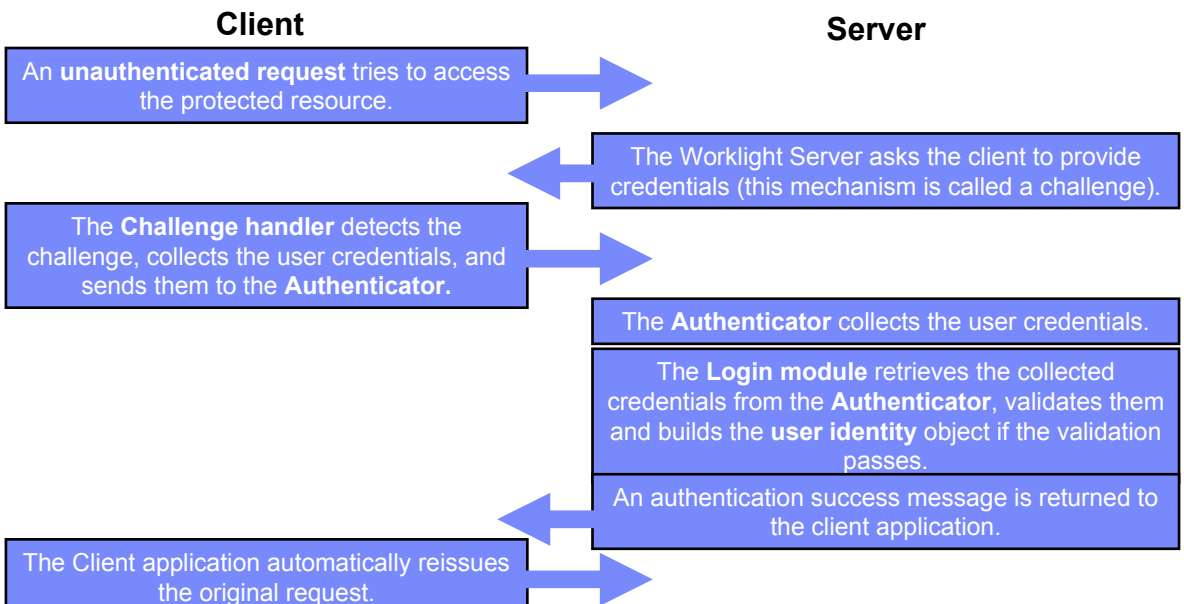
- Authentication concepts and entities
- Defining realms, authenticators, and login modules
- Defining security tests
- Protecting applications
- Protecting adapters
- Protecting static resources
- What's next

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 a *Challenge Handler* component on a client side, and an *Authenticator* component and a *Login Module* component on a server side.
- The same authentication realm can be used to protect several resources.
- Detailed definitions of all authentication components are given on later slides.

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.

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

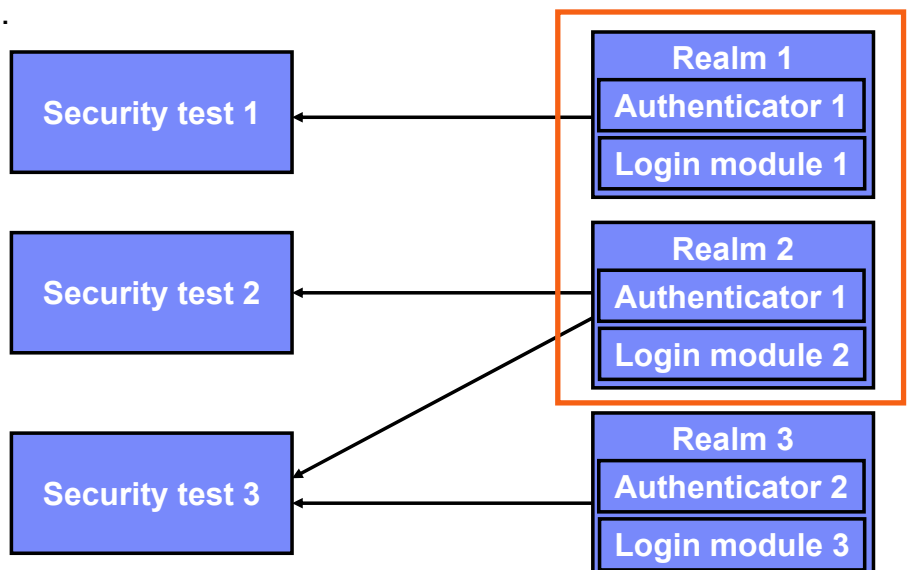
- An authentication realm is a combination of one authenticator and one login module.
- Each authentication realm defines its authentication flow:
  - What should happen after the authentication process is triggered?
  - What is the form of challenge that should be sent to the client application?
  - 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

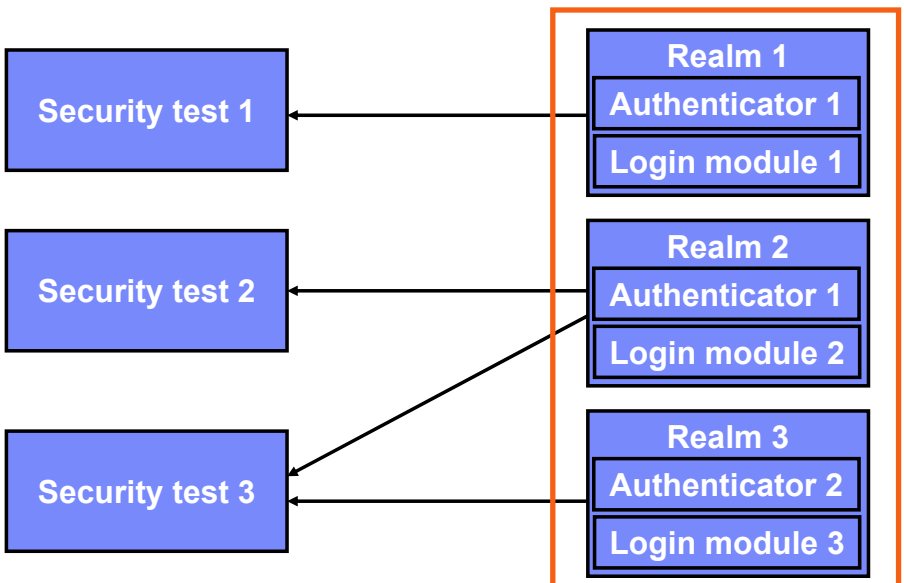
Authentication concepts and entities

- This figure shows a sample authentication configuration.
- Notice that the same Authenticator **type** can be used for several realms.



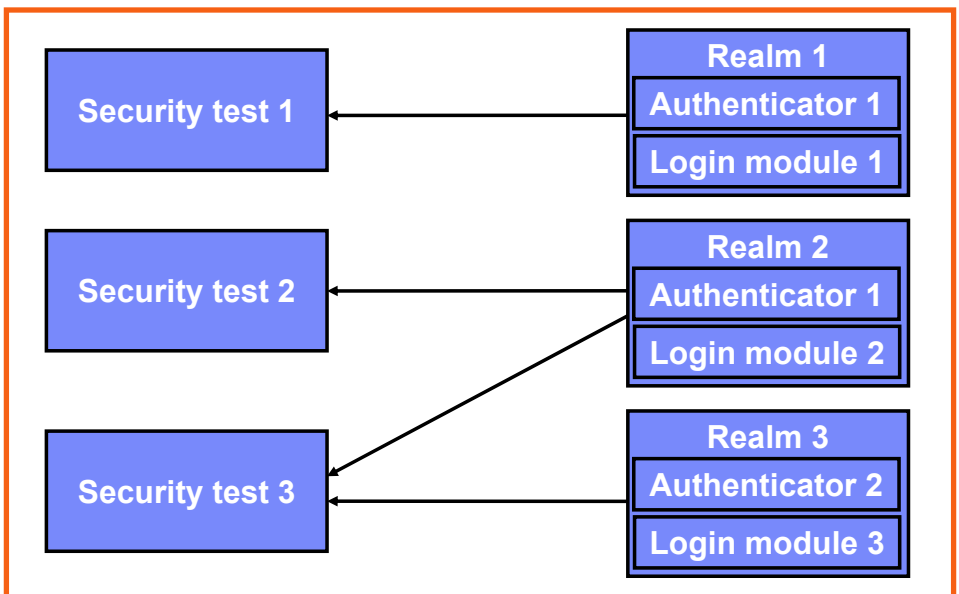
Authentication concepts and entities

- Each authentication realm has one authenticator and one login module only.



Authentication concepts and entities

- Each security test can use one or more realms.
- Each realm can be used by one or more security tests.



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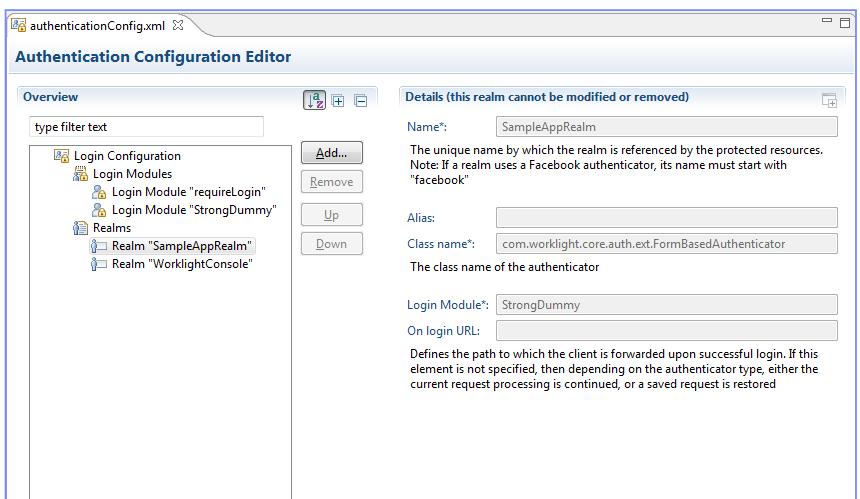
Defining realms, authenticators, and login modules

- 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="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.

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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 Info Center).
- 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 Info Center).
  - An application authenticity test (see the IBM Worklight Info Center).
  - An ability to remotely disable mobile application from the Worklight console.
- Each **mobileSecurityTest** must contain one **<testUser>** element with realm definition.
- This realm will be considered a user 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>
```

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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.

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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>
```

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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>
```

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What's next

- In the following modules, you will implement several authentication types:
  - Module 21: how to implement an adapter-based authentication
  - Module 22: how to implement a form-based authentication
  - Module 23: how to implement a custom Java authenticator and a login module
  - Module 24: how to use an LPTA token in the WebSphere Application Server
- See the IBM Worklight Information Center 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.
  - 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.
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  - 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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  - Each authenticator element must specify its realm and its loginModule.

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