

Spring Security UI Plugin - Reference Documentation

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Chapter 1. Introduction to the Spring Security UI Plugin

The Spring Security UI plugin provides CRUD screens and other user management workflows. Non-default functionality is available only if the feature is available; this includes the ACL controllers and views which are enabled if the [ACL plugin](#) is installed, Requestmaps support which is available if `grails.plugin.springsecurity.securityConfigType` is set to `"Requestmap"` or `SecurityConfigType.Requestmap` in `application.groovy`, and persistent cookies support which is enabled if it has been configured with the `s2-create-persistent-token` script.



The plugin works with Grails 3.0.x but not with 3.1.x yet. This will be resolved in the next release.

1.1. Release History

- December 21, 2015
 - 3.0.0.M1 release
- December 21, 2015
 - 1.0-RC3 release
- May 20, 2014
 - 1.0-RC2 release
- November 11, 2013
 - 1.0-RC1 release
 - [JIRA Issues](#)
- February 12, 2012
 - 0.2 release
 - [JIRA Issues](#)
- September 14, 2010
 - 0.1.2 release
 - [JIRA Issues](#)
- July 27, 2010
 - 0.1.1 release
- July 26, 2010
 - initial 0.1 release

Chapter 2. User Management

2.1. User search

The default action for the User controller is search. By default only the standard fields (`username`, `enabled`, `accountExpired`, `accountLocked`, and `passwordExpired`) are available but this is customizable with the `s2ui-override` script - see the [Customization](#) section for details.

You can search by any combination of fields, and the `username` field has an Ajax autocomplete to assist in finding instances. In this screenshot you can see that an `email` field has been added to the domain class and UI. Leave all fields empty and all checkboxes set at "Either" to return all instances.

[Users](#) [Roles](#) [Registration Code](#) [Security Info](#)

Spring Security Management Console Logged in as admin ([Logout](#))

User Search

Username:

Email:

	True	False	Either
Enabled:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Account Expired:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Account Locked:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Password Expired:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Search

This example shows a search for usernames containing 'adm' (the search is case-insensitive and the search string can appear anywhere in the username). Results are shown paginated in groups of 10. All of the column headers are clickable and will sort the results by that field.

User Search

Username:

Email:

True
False
Either

Enabled:

☐

☐

☒

Account Expired:

☐

☐

☒

Account Locked:

☐

☐

☒

Password Expired:

☐

☐

☒

Username	Email	Enabled	Account Expired	Account Locked	Password Expired
farzadmiraiei	farzadmiraiei@foo.com	True	False	False	False
cadmus	cadmus@foo.com	True	False	False	False
chenreadme	chenreadme@foo.com	True	False	False	False
admatha	admatha@foo.com	True	False	False	False
sajjadmohebi	sajjadmohebi@foo.com	True	False	False	False
cadmo	cadmo@foo.com	True	False	False	False
padmawar	padmawar@foo.com	True	False	False	False
padma	padma@foo.com	True	False	False	False
ysunadmin	ysunadmin@foo.com	True	False	False	False
farzadmokh	farzadmokh@foo.com	True	False	False	False

1 [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [Next](#)

Showing 1 through 10 out of 100.

2.2. User edit

After clicking through to the 'admin' User you get to the edit page (there are no view pages):

Edit User

User Details

Roles

Username

admin

Email

admin@foo.com

Password

.....

Enabled

☒

Account Expired

☐

Account Locked

☐

Password Expired

☐

Update

Delete

Login as user

You can update any of the attributes or delete the User. You can see that there's a "Login as user" button here - that is only shown if you're authenticated with a User who is granted `ROLE_SWITCH_USER` (this role name can be configured in `application.groovy`):

This allows you to temporarily assume the identity of another User (see [the Spring Security Core plugin documentation](#) for more information about switch-user). The "Logged in as ..." information in the top right of the screen will change to show that you're running as another User and provide a link to switch back. The role name `ROLE_SWITCH_USER` is the default but you can change the value with the `grails.plugin.springsecurity.ui.switchUserRoleName` setting in `application.groovy`.

If you click the Roles tab you can see the roles granted to this User and can click through to its edit page:

Edit User

User Details

Roles

☒ ROLE_ADMIN

☒ ROLE_SWITCH_USER

☐ ROLE_USER

Update

Delete

2.3. User creation

You can create new Users by going to </user/create> or by clicking the **Create** action in the **Users** menu.

Create User

User Details

Roles

Username

Email

Password

Enabled

Account Expired

Account Locked

Password Expired

☐

☐

☐

☐


Create

Chapter 3. Role Management

3.1. Role search

The default action for the Role controller is search. By default only the **authority** field is available but this is customizable with the [s2ui-override](#) script - see the [Customization](#) section for details.

The **authority** field has an Ajax autocomplete to assist in finding instances. Leave the field empty to return all instances.

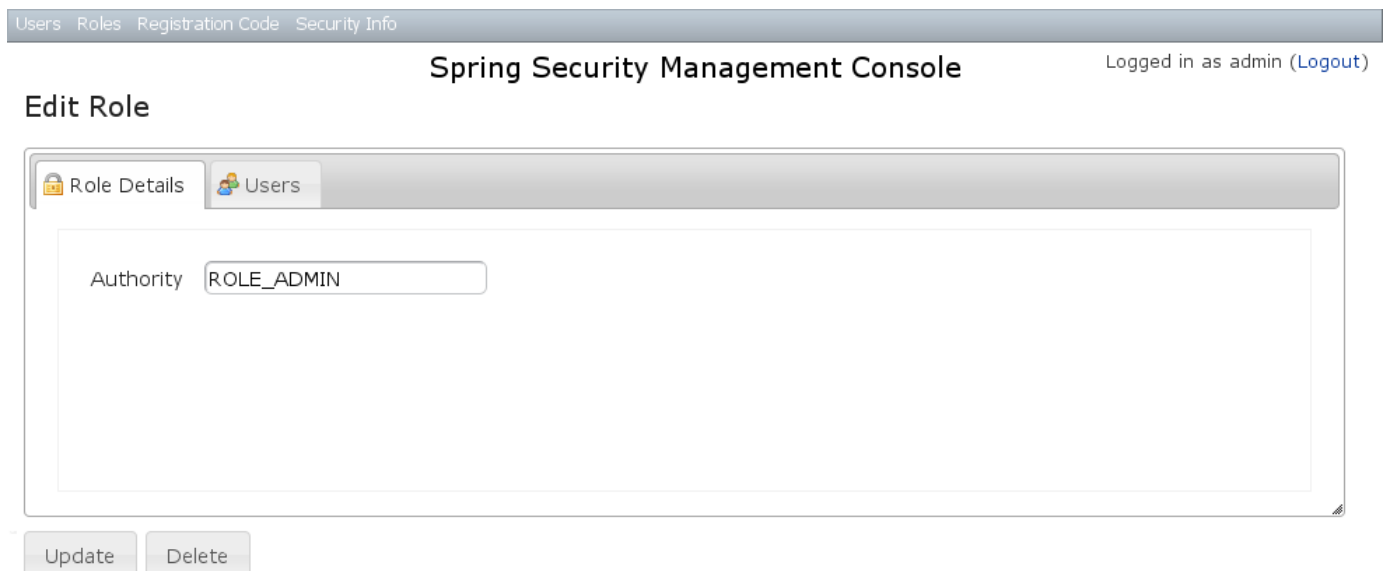


The screenshot shows the 'Spring Security Management Console' interface. At the top, there is a navigation bar with links: 'Users', 'Roles', 'Registration Code', and 'Security Info'. On the right, it says 'Logged in as admin (Logout)'. The main content area is titled 'Role Search'. It contains a form with a label 'Authority:' followed by a text input field. Below the input field is a 'Search' button.

Search is case-insensitive and the search string can appear anywhere in the name (and you can omit the **ROLE_** prefix). Results are shown paginated in groups of 10 but if there's only one result you'll be forwarded to the edit page for that Role. The **authority** column header is clickable and will sort the results by that field.

3.2. Role edit

After clicking through to a Role you get to the edit page (there are no view pages):



The screenshot shows the 'Spring Security Management Console' interface for editing a role. The navigation bar is the same as in the previous screenshot. The main content area is titled 'Edit Role'. It has two tabs: 'Role Details' (selected) and 'Users'. The 'Role Details' tab contains a form with a label 'Authority' followed by a text input field containing the value 'ROLE_ADMIN'. Below the form are two buttons: 'Update' and 'Delete'.

You can update any of the attributes or delete the Role. Any user that had been granted the Role will lose the grant but otherwise be unaffected.


If you click the Users tab you can see which users have a grant for this Role and can click through to their edit page:


[Users](#) [Roles](#) [Registration Code](#) [Security Info](#)

Spring Security Management Console

Logged in as admin ([Logout](#))

Edit Role

 Role Details

 Users

admin

Update

Delete

3.3. Role creation

You can create new Roles by going to [/role/create](#) or by clicking the **Create** action in the **Roles** menu.

[Users](#) [Roles](#) [Registration Code](#) [Security Info](#)

Spring Security Management Console

Logged in as admin ([Logout](#))

Create Role

Authority

Create

Chapter 4. Requestmap Management

The default approach to securing URLs is with annotations, so the Requestmaps menu is only shown if `grails.plugin.springsecurity.securityConfigType` has the value `"Requestmap"` or `SecurityConfigType.Requestmap` in `application.groovy`.

4.1. Requestmap search

The default action for the Requestmap controller is search. By default only the standard fields (`url` and `configAttribute`) are available but this is customizable with the `s2ui-override` script - see the [Customization](#) section for details.

You can search by any combination of fields, and the `url` and `configAttribute` fields have an Ajax autocomplete to assist in finding instances. Leave both fields empty to return all instances.

[Users](#) [Roles](#) [Requestmaps](#) [Registration Code](#) [Security Info](#)

Spring Security Management Console Logged in as admin ([Logout](#))

Requestmap Search

URL:

Config Attribute:

Search

Searching is case-insensitive and the search string can appear anywhere in the field. Results are shown paginated in groups of 10 and you can click on either header to sort by that field:

[Users](#) [Roles](#) [Requestmaps](#) [Registration Code](#) [Security Info](#)

Spring Security Management Console Logged in as admin ([Logout](#))

Requestmap Search

URL:

Config Attribute:

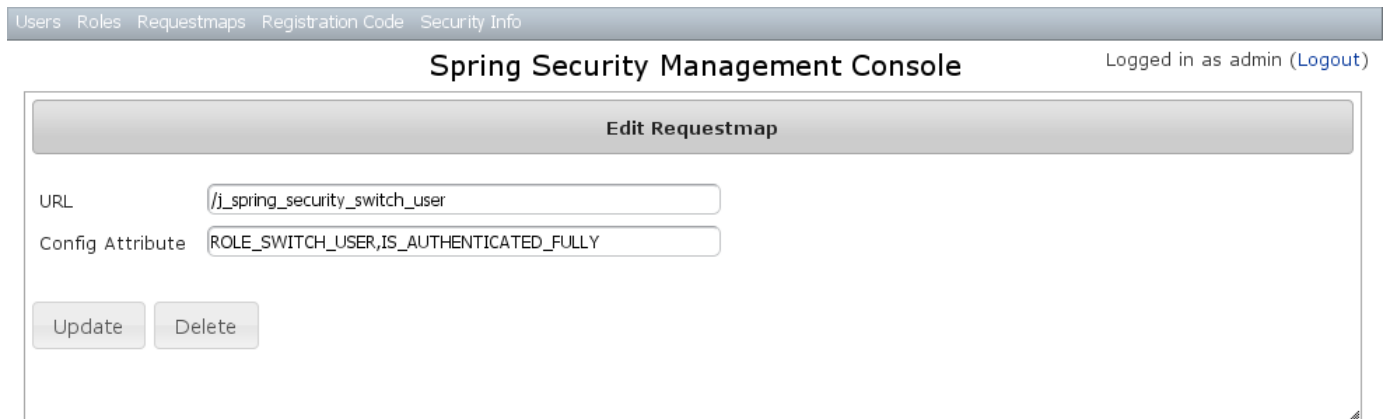
Search

URL	Config Attribute
/j_spring_security_switch_user	ROLE_SWITCH_USER,IS_AUTHENTICATED_FULLY
/secure/**	ROLE_ADMIN

Showing 1 through 2 out of 2.

4.2. Requestmap edit

After clicking through to a Requestmap you get to the edit page (there are no view pages):

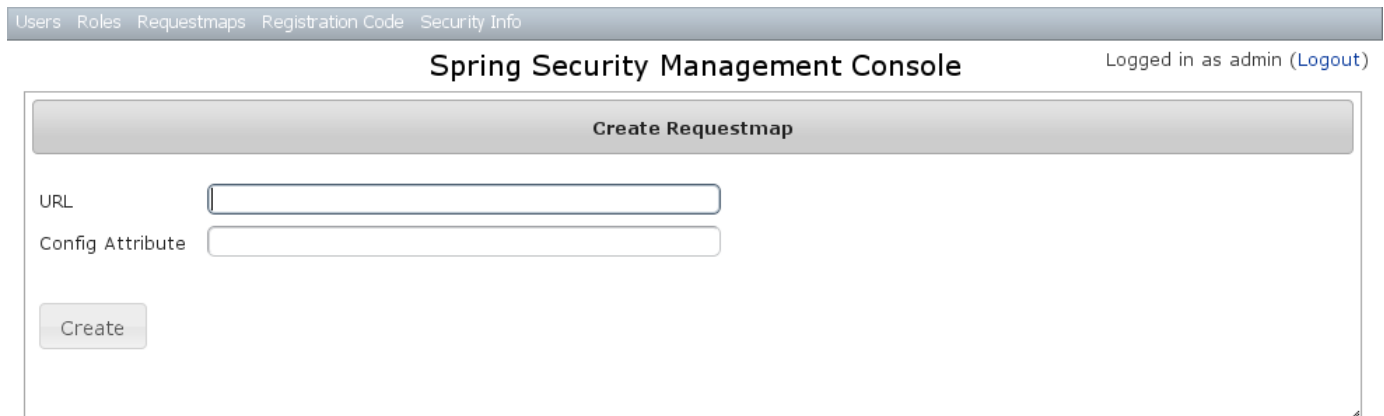


The screenshot shows the 'Spring Security Management Console' interface. At the top, there is a navigation bar with links: Users, Roles, Requestmaps, Registration Code, and Security Info. The user is logged in as 'admin' with a 'Logout' link. The main heading is 'Spring Security Management Console'. Below this is a sub-heading 'Edit Requestmap'. The form contains two input fields: 'URL' with the value '/j_spring_security_switch_user' and 'Config Attribute' with the value 'ROLE_SWITCH_USER,IS_AUTHENTICATED_FULLY'. At the bottom of the form are two buttons: 'Update' and 'Delete'.

You can update any of the attributes or delete the Requestmap. Editing or deleting a Requestmap resets the cache of loaded instances, so your changes will take effect immediately.

4.3. Requestmap creation

You can create new Requestmaps by going to </requestmap/create> or by clicking the **Create** action in the **Requestmaps** menu.



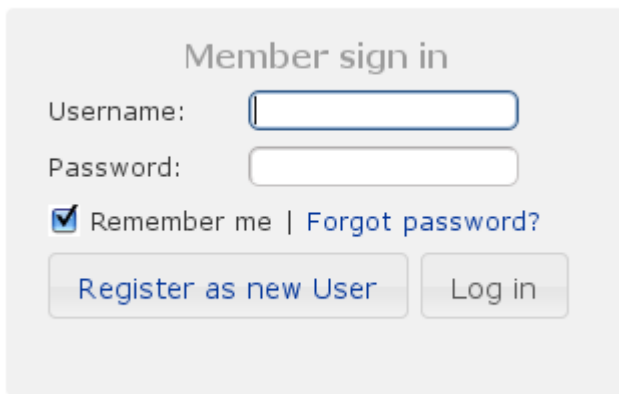
The screenshot shows the 'Spring Security Management Console' interface. At the top, there is a navigation bar with links: Users, Roles, Requestmaps, Registration Code, and Security Info. The user is logged in as 'admin' with a 'Logout' link. The main heading is 'Spring Security Management Console'. Below this is a sub-heading 'Create Requestmap'. The form contains two input fields: 'URL' and 'Config Attribute'. At the bottom of the form is a single button: 'Create'.

Creating a Requestmap resets the cache of loaded instances, so your changes will take effect immediately.

Chapter 5. User Registration

Most of the plugin's controllers are intended to be part of a backend admin application, but the Registration and Forgot Password workflows are expected to be user-facing. So they're not available in the admin menu like the User, Role, and other backend functionality - you'll need to expose them to your users.

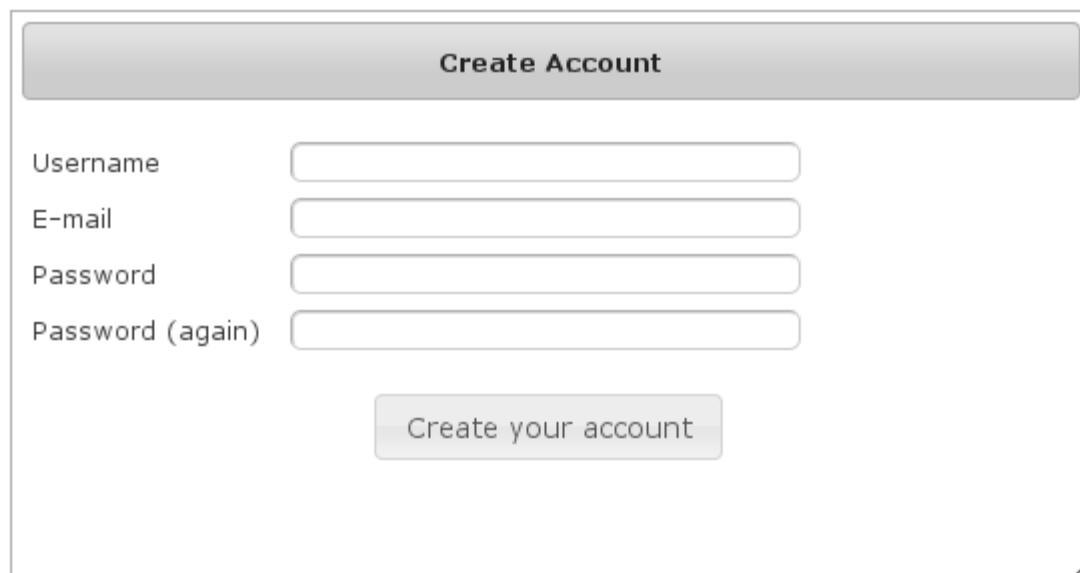
One way to do this is to replace the default `login.gsp` that's provided by the Spring Security Core plugin with this plugin's version. You can do this by running `grails s2ui-override auth -s2ui-override` script - see the [Customization](#) section for details. If you do this your users will have links to both workflows from the login screen:



The image shows a login form titled "Member sign in". It contains two input fields: "Username:" and "Password:". Below the password field is a checkbox labeled "Remember me" which is checked, followed by a link "Forgot password?". At the bottom, there are two buttons: "Register as new User" and "Log in".

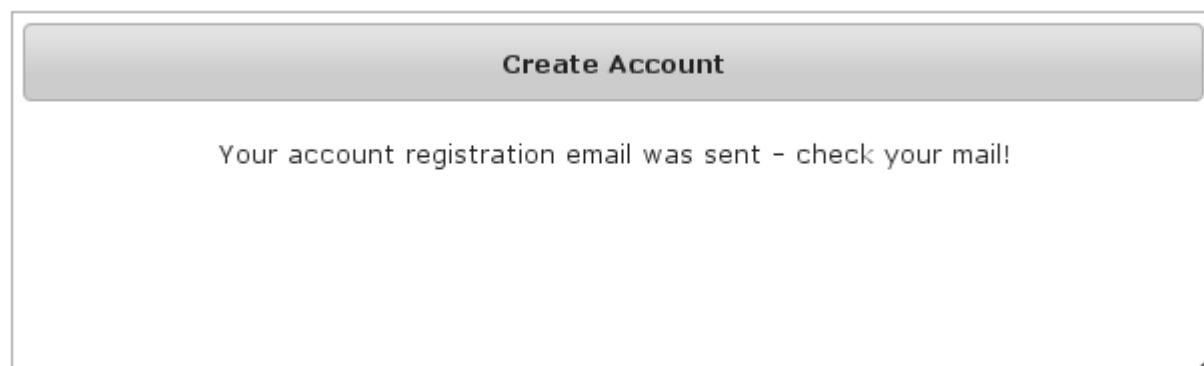
5.1. Registration

Navigate to `/register/`:



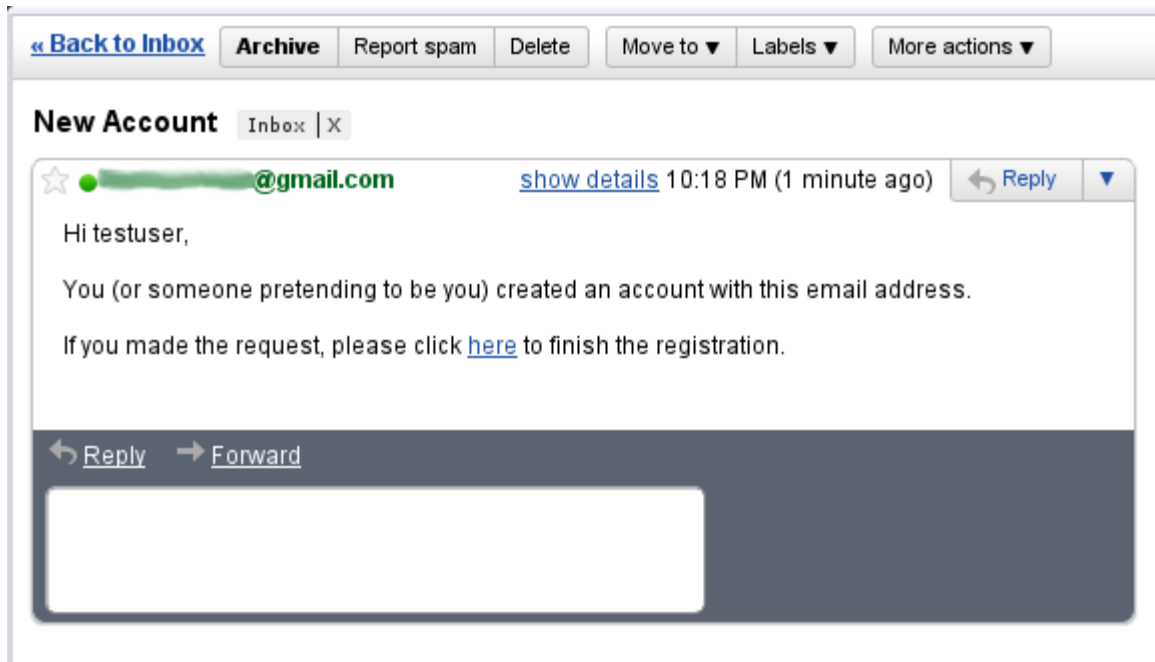
A screenshot of a web form titled "Create Account". The form is enclosed in a light gray border. At the top, there is a dark gray header bar with the text "Create Account" in white. Below the header, there are four input fields, each with a label to its left: "Username", "E-mail", "Password", and "Password (again)". Each input field is a simple white rectangle with a thin gray border. Below the input fields, there is a single button with the text "Create your account" in a light gray font. The button has a subtle gradient and a slight shadow. The bottom right corner of the form has a small, dark gray triangle icon.

After filling out valid values an email will be sent and you'll see a success screen:




A screenshot of a web form titled "Create Account". The form is enclosed in a light gray border. At the top, there is a dark gray header bar with the text "Create Account" in white. Below the header, the text "Your account registration email was sent - check your mail!" is displayed in a dark gray font. The bottom right corner of the form has a small, dark gray triangle icon.

Click on the link in the email:



and you'll finalize the process, which involves enabling the locked user and pre-authenticating, then redirecting to the configured destination:



 Your registration is complete

Logged in as testuser (Logout)

5.2. Configuration

The post-registration destination url is configurable in `grails-app/conf/application.groovy` using the `postRegisterUrl` attribute:

```
grails.plugin.springsecurity.ui.register.postRegisterUrl = '/welcome'
```

If you don't specify a value then the `grails.plugin.springsecurity.successHandler.defaultTargetUrl` value will be used, which is `'/'` by default.

You can customize the subject, body, and from address of the registration email by overriding the default values in `grails-app/conf/application.groovy`, for example:

```
grails.plugin.springsecurity.ui.register.emailBody = '...'
grails.plugin.springsecurity.ui.register.emailFrom = '...'
grails.plugin.springsecurity.ui.register.emailSubject = '...'
```

The `emailBody` property should be a GString and will have the User domain class instance in scope in the `user` variable, and the generated url to click to finalize the signup in the `url` variable.

In addition, each new user will be granted `ROLE_USER` after finalizing the registration. If you want to change the default role, add more, or grant no roles at all (for example if you want an admin to approve new users and explicitly enable new users) then you can customize that with the `defaultRoleNames` attribute (which is a List of Strings):

```
grails.plugin.springsecurity.ui.register.defaultRoleNames = [] // no roles
```

or

```
grails.plugin.springsecurity.ui.register.defaultRoleNames = ['ROLE_CUSTOMER']
```

5.3. Mail configuration

By default the plugin uses the `Mail` plugin to send emails, but only if it installed. This is configurable by registering your own `MailStrategy` implementation - see [the section on configuration|guide:customization] for more information. The plugin assumes that the Mail plugin and an SMTP server are already configured.

5.4. Notes

You should consider the registration code as starter code - every signup workflow will be different, and this should help you get going but is unlikely to be sufficient. You may wish to collect more information than just username and email - first and last name for example. Run `grails s2ui-override register` to copy the registration controller and GSPs into your application to be customized.

If there are unexpected validation errors during registration (which can happen when there is a disconnect between the domain classes and the code in `RegisterController` they will be logged at the `warn` or `error` level, so enable logging to ensure that you see the messages, e.g.

```
...
logger 'grails.plugin.springsecurity.ui.SpringSecurityUiService', WARN
...
```




`RegisterController` and its GSPs assume that your User domain class has an `email` field. Be sure to either rework the workflow (using the `s2ui-override` script) if you don't need an email confirmation step or add an email field.

5.5. RegistrationCode search

The plugin uses its `grails.plugin.springsecurity.ui.RegistrationCode` domain class to store a token associated with the new users' username for use when finishing the registration process after the user clicks the link in the generated email (and also as part of the forgot-password workflow). The plugin includes a controller and GSPs to manage these instances.

The default action for the `RegistrationCode` controller is `search`. By default only the standard fields (`username` and `token`) are available but this is customizable with the `s2ui-override` script - see the [Customization](#) section for details.

You can search by any combination of fields, and both fields have an Ajax autocomplete to assist in finding instances. Leave both fields empty to return all instances.

The screenshot shows the Spring Security Management Console interface. At the top, there is a navigation bar with links: Users, Roles, Requestmaps, Registration Code, ACL, and Security Info. The current page is titled "Spring Security Management Console" and shows the user is logged in as admin with a Logout link. The main content area is titled "Registration Code Search" and contains a form with two input fields: "Username:" and "Token:". Below these fields is a "Search" button. The form is designed for searching through registration codes by username or token.

Searching is case-insensitive and the search string can appear anywhere in the field. Results are shown paginated in groups of 10 and you can click on any header to sort by that field:

Registration Code Search

Username: Token:

Token	Username	Date Created
e81b1e53648a47e6aef31a937154c7cb	registration_test_1	2015-12-19
4a7f88afec3746f7aab2f5d0d8df6d8e	registration_test_1	2015-12-19
c7ac5f23be70495f93e4450a78a27cb4	registration_test_1	2015-12-19
a50e061e0e2f424fb7fbc2ff3dae597d	registration_test_1	2015-12-19
d6938ad63c414a69a0da30a8c0619a60	registration_test_2	2015-12-19
4a589c642ea143abb2eca57fa0a0cc	registration_test_2	2015-12-19
0a154624f36d42e4aa68991a9477bd04	registration_test_2	2015-12-19
3842a6ae102a431c8e48177c16720713	registration_test_3	2015-12-19
84cefa66465a460c82f46120d9098686	registration_test_3	2015-12-19
fd1e40a7b31f4e8282a2a789135ed21d	registration_test_3	2015-12-19

1

Showing 1 through 10 out of 14.

5.6. RegistrationCode edit

After clicking through to a RegistrationCode you get to the edit page (there are no view pages):

Edit RegistrationCode

Username Token

Date Created 2015-12-19

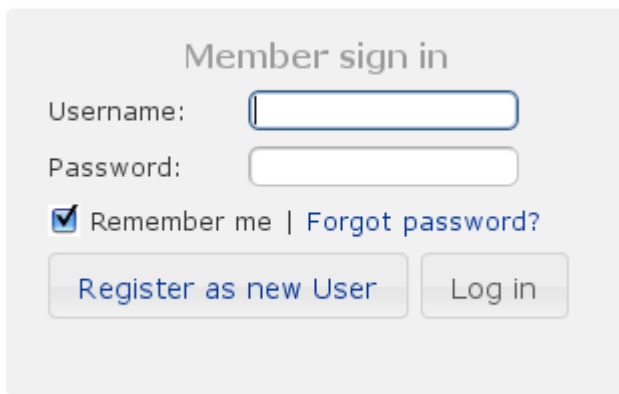
You can update the **username** or **token** attribute or delete the RegistrationCode.

Since instances are created during the "User Registration" and "Forgot Password" workflows, there is no functionality in this plugin to create new instances.

Chapter 6. Forgot Password

Like the Registration workflow, the Forgot Password workflow is expected to be user-facing. So it's not available in the admin menu like the User, Role, and other backend functionality - you'll need to expose them to your users.

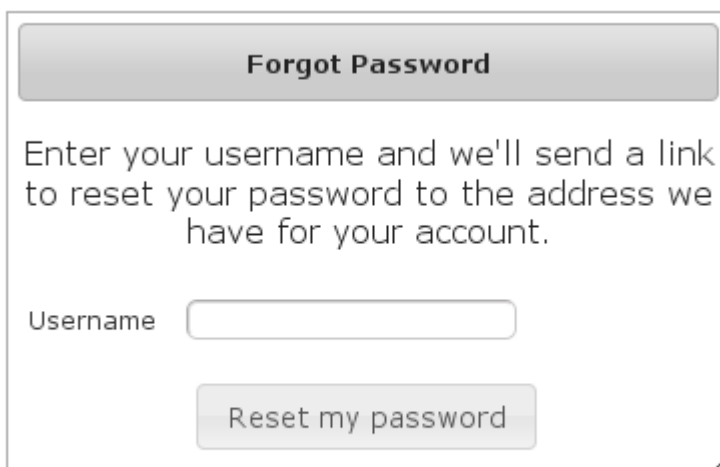
One way to do this is to replace the default `login.gsp` that's provided by the Spring Security Core plugin with this plugin's version. You can do this by running `grails s2ui-override auth` - see the section on [Customization](#) for more details. If you do this your users will have links to both workflows from the login screen:



A screenshot of a 'Member sign in' form. It features a title 'Member sign in' at the top. Below the title are two input fields: 'Username:' and 'Password:'. Under the password field is a checkbox labeled 'Remember me' followed by a link 'Forgot password?'. At the bottom are two buttons: 'Register as new User' and 'Log in'.

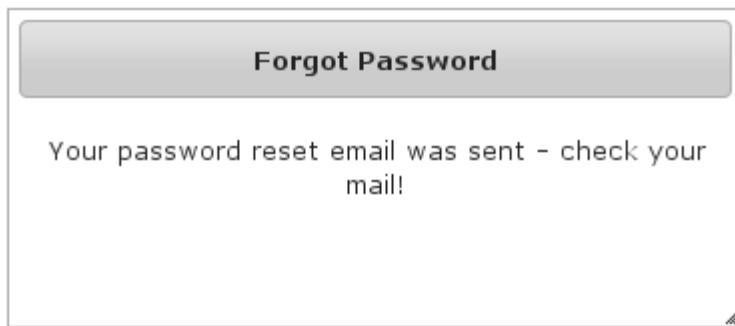
6.1. Forgot Password

Navigate to `/register/forgotPassword`:

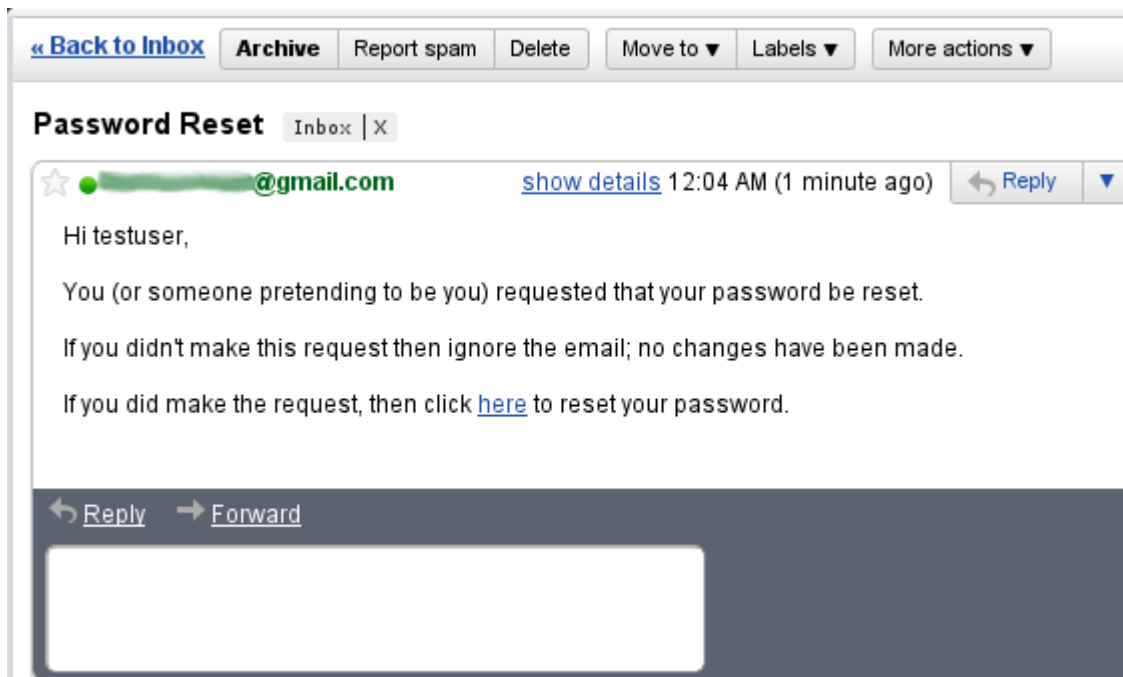


A screenshot of a 'Forgot Password' form. It has a title bar 'Forgot Password'. Below the title bar is a text instruction: 'Enter your username and we'll send a link to reset your password to the address we have for your account.' Below this is a 'Username' input field and a 'Reset my password' button.

After entering a valid username an email will be sent and you'll see a success screen:



Click on the link in the email:



and you'll open the reset password form:

Reset Password

Enter your new password


Password

Password (again)

Update my password

After entering a valid password you'll finalize the process, which involves storing the new password hashed in the user table and pre-authenticating, then redirecting to the configured destination:



 Your password was successfully changed

Logged in as testuser ([Logout](#))

6.2. Configuration

The post-reset destination url is configurable in `grails-app/conf/application.groovy` using the `postResetUrl` attribute:

```
grails.plugin.springsecurity.ui.forgotPassword.postResetUrl = '/reset'
```

If you don't specify a value then the `defaultTargetUrl` value will be used, which is `'/'` by default.

You can customize the subject, body, and from address of the reset email by overriding the default values in `grails-app/conf/application.groovy`, for example:

```
grails.plugin.springsecurity.ui.forgotPassword.emailBody = '...'
grails.plugin.springsecurity.ui.forgotPassword.emailFrom = '...'
grails.plugin.springsecurity.ui.forgotPassword.emailSubject = '...'
```

The `emailBody` property should be a `GString` and will have the `User` domain class instance in scope in the `user` variable, and the generated url to click to reset the password in the `url` variable.

6.3. Mail configuration

By default the plugin uses the `Mail` plugin to send emails, but only if it installed. This is configurable by registering your own `MailStrategy` implementation - see [the section on configuration|guide:customization] for more information. The plugin assumes that the `Mail` plugin and an SMTP server are already configured.

6.4. Notes

Like the registration code, consider this workflow as starter code. Run `grails s2ui-override register` to copy the registration controller and GSPs into your application to be customized.



`RegisterController` and its GSPs assume that your `User` domain class has an `email` field.

Chapter 7. ACL Management

ACL management should be done using the API exposed by `AclService` and `AclUtilService`. Both services have a much more intuitive and convenient high-level approach to managing ACLs, ACEs, etc. The functionality in this plugin is to provide a CRUD interface for fine-grained ACL management.

The ACL menu is only available if the [ACL plugin](#) is installed.

7.1. AclClass Management

The default action for the `AclClass` controller is search. By default only the standard fields are available but this is customizable with the `s2ui-override` script - see the [Customization](#) section for details.

The `className` field has an Ajax autocomplete to assist in finding instances. Leave the field empty to return all instances.

[Users](#) [Roles](#) [Registration Code](#) [Security Info](#)

Spring Security Management Console Logged in as admin ([Logout](#))

AclClass Search

Class Name:

Search

Searching is case-insensitive and the search string can appear anywhere in the field. Results are shown paginated in groups of 10 and you can click on the `className` column header to sort the results by that field:

[Users](#) [Roles](#) [Registration Code](#) [ACL](#) [Security Info](#)

Spring Security Management Console Logged in as admin ([Logout](#))

AclClass Search

Class Name:

Search

Class Name
com.burtbeckwith.testapp.domain.Report

Showing 1 through 1 out of 1.

7.1.1. AclClass Edit

After clicking through an AclClass you get to the edit page (there are no view pages):



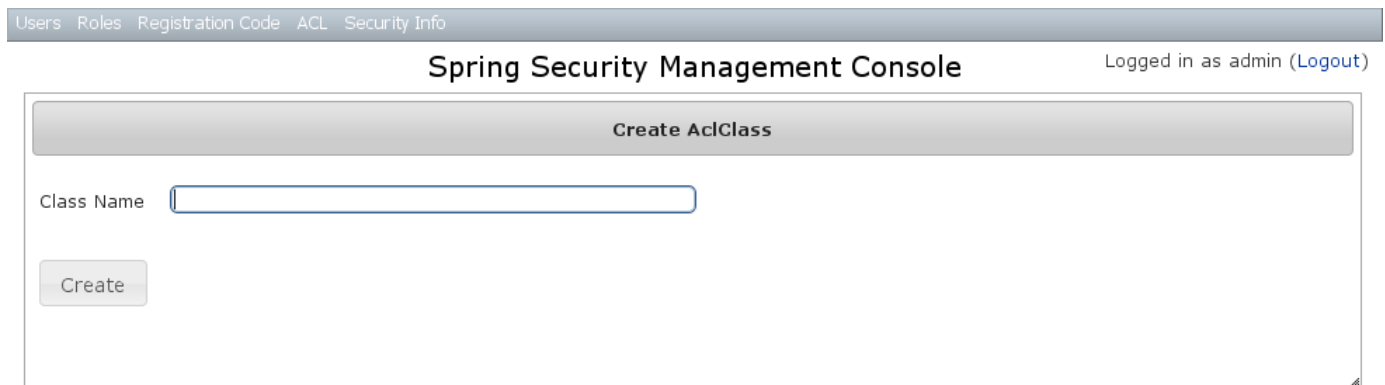
The screenshot shows the 'Edit AclClass' page in the Spring Security Management Console. The top navigation bar includes links for Users, Roles, Registration Code, ACL, and Security Info. The user is logged in as 'admin' with a 'Logout' link. The main heading is 'Spring Security Management Console'. Below this is a form titled 'Edit AclClass'. The form contains a 'Class Name' input field with the value 'com.burtbeckwith.testapp.domain.Report'. Below the input field are two links: 'View Associated OIDs' and 'View Associated ACL Entries'. At the bottom of the form are two buttons: 'Update' and 'Delete'.

You can update the name, and delete the instance if there aren't any associated **AclObjectIdentity** or **AclEntry** instances - by default there is no support for cascading.

You can also see the associated **AclObjectIdentity** instances (OIDs) or **AclEntry** instances.

7.1.2. AclClass Create

You can create new instances by going to **/aclClass/create** or by clicking the **Create** action in the **Class** menu under **ACL**.



The screenshot shows the 'Create AclClass' page in the Spring Security Management Console. The top navigation bar includes links for Users, Roles, Registration Code, ACL, and Security Info. The user is logged in as 'admin' with a 'Logout' link. The main heading is 'Spring Security Management Console'. Below this is a form titled 'Create AclClass'. The form contains a 'Class Name' input field. Below the input field is a 'Create' button.

7.2. AclSid Management

The default action for the AclSid controller is search. By default only the standard fields are available but this is customizable with the **s2ui-override** script - see the **Customization** section for details.

The **sid** field has an Ajax autocomplete to assist in finding instances. Leave the field empty and **principal** set to Either to return all instances.

AclSid Search

SID:

True False Either

Principal: ☐ ☐ ☒

Results are shown paginated in groups of 10. The column headers are clickable and will sort the results by that field:

AclSid Search

SID:

True False Either

Principal: ☐ ☐ ☒

SID	Principal
-----	-----------

user2	True
-------	------

admin	True
-------	------

user1	True
-------	------

Showing 1 through 3 out of 3.

7.2.1. AclSid Edit

After clicking through to a sid you get to the edit page (there are no view pages):

Edit AclSid

SID

Principal ☒

[View Associated OIDs](#)

[View Associated ACL Entries](#)

You can update the name and whether it's a Principal sid or a Role sid, and delete the instance if there aren't any associated [AclObjectIdentity](#) or [AclEntry](#) instances - by default there is no support for cascading.

You can also see the associated [AclObjectIdentity](#) instances (OIDs) or [AclEntry](#) instances.

7.2.2. AclSid Create

You can create new instances by going to [/aclSid/create](#) or by clicking the [Create](#) action in the [SID](#) menu under [ACL](#).

Create AclSid

SID

Principal ☐

7.3. AclObjectIdentity Management

The default action for the [AclObjectIdentity](#) controller is search. By default only the standard fields are available but this is customizable with the [s2ui-override](#) script - see the [Customization](#) section for details.

Leave all fields at their default values to return all instances.

AclObjectIdentity Search

AclClass: All

Object ID:

Owner: All

Parent:

True
False
Either

Entries Inheriting:

☐ True
☐ False
☒ Either

Search

Results are shown paginated in groups of 10 and you can click on any header to sort by that field:

AclObjectIdentity Search

AclClass: All

Object ID:

Owner: All

Parent:

True
False
Either

Entries Inheriting:

☐ True
☐ False
☒ Either

Search

ID	AclClass	Object ID	Entries Inheriting	Owner	Parent
3	com.burtbeckwith.testapp.domain.Report	3	True	admin	
6	com.burtbeckwith.testapp.domain.Report	6	True	admin	
1	com.burtbeckwith.testapp.domain.Report	1	True	user1	
4	com.burtbeckwith.testapp.domain.Report	4	True	admin	
10	com.burtbeckwith.testapp.domain.Report	10	True	admin	
8	com.burtbeckwith.testapp.domain.Report	8	True	admin	
7	com.burtbeckwith.testapp.domain.Report	7	True	admin	
5	com.burtbeckwith.testapp.domain.Report	5	True	admin	
9	com.burtbeckwith.testapp.domain.Report	9	True	admin	
2	com.burtbeckwith.testapp.domain.Report	2	True	user1	

1

2
3
4
5
6
7
8
9
10
Next

Showing 1 through 10 out of 100.

7.3.1. AclObjectIdentity Edit

After clicking through to an AclObjectIdentity you get to the edit page (there are no view pages):

Edit AclObjectIdentity

AclClass

com.burtbeckwith.testapp.domain.Report

Object ID

3

Owner

admin

Parent

Entries Inheriting

☒

View Associated ACL Entries

Update

Delete

You can update any of the attributes, and can delete the instance if there aren't any associated **AclEntry** instances - by default there is no support for cascading.

You can also see the associated **AclEntry** instances.

7.3.2. AclObjectIdentity Create

You can create new instances by going to `/aclObjectIdentity/create` or by clicking the **Create** action in the **OID** menu under **ACL**.

Create AclObjectIdentity

AclClass

Object ID

Owner

Parent

Entries Inheriting

☐

Create

7.4. AclEntry Management

The default action for the AclEntry controller is search. By default only the standard fields are available but this is customizable with the `s2ui-override` script - see the [Customization](#) section for details.

Leave all fields at their default values to return all instances.

AclEntry Search

AclObjectIdentity:

Ace Order:

SID:

All

Mask:

Granting:

True ☐

False ☐

Either ☒

Audit Success:

True ☐

False ☐

Either ☒

Audit Failure:

True ☐

False ☐

Either ☒

Results are shown paginated in groups of 10 and you can click on any header to sort by that field:

AclEntry Search

AclObjectIdentity:

Ace Order:

SID:

All

Mask:

Granting:

True ☐

False ☐

Either ☒

Audit Success:

True ☐

False ☐

Either ☒

Audit Failure:

True ☐

False ☐

Either ☒

ID	AclObjectIdentity	Ace Order	SID	Mask	Granting	Audit Success	Audit Failure
99	5	2	user2	BasePermission[.....W.=2]	True	False	False
94	4	0	user1	BasePermission[.....R=1]	True	False	False
95	4	1	user2	BasePermission[.....R=1]	True	False	False
100	5	3	admin	BasePermission[.....A....=16]	True	False	False
96	4	2	admin	BasePermission[.....A....=16]	True	False	False
93	3	2	admin	BasePermission[.....A....=16]	True	False	False
91	3	0	user1	BasePermission[.....R=1]	True	False	False
92	3	1	user2	BasePermission[.....R=1]	True	False	False
97	5	0	user1	BasePermission[.....R=1]	True	False	False
98	5	1	user2	BasePermission[.....R=1]	True	False	False

1
2
3
4
5
6
7
8
9
10
..
18
Next

Showing 1 through 10 out of 175.

7.4.1. AclEntry Edit

After clicking through to an AclEntry you get to the edit page (there are no view pages):

Edit AclEntry

AclObjectIdentity	<input type="text" value="5"/>
Ace Order	<input type="text" value="2"/>
SID	<input type="text" value="user2"/>
Mask	<input type="text" value="2"/>
Granting	<input checked="" type="checkbox"/>
Audit Success	<input type="checkbox"/>
Audit Failure	<input type="checkbox"/>

You can update any of the attributes or delete the AclEntry.

7.4.2. AclEntry Create

You can create new instances by going to </aclEntry/create> or by clicking the **Create** action in the **Entry** menu under **ACL**.

Create AclEntry

AclObjectIdentity	<input type="text"/>
Ace Order	<input type="text" value="0"/>
SID	<input type="text"/>
Mask	<input type="text" value="0"/>
Granting	<input checked="" type="checkbox"/>
Audit Success	<input type="checkbox"/>
Audit Failure	<input type="checkbox"/>

Chapter 8. Persistent Cookie Management

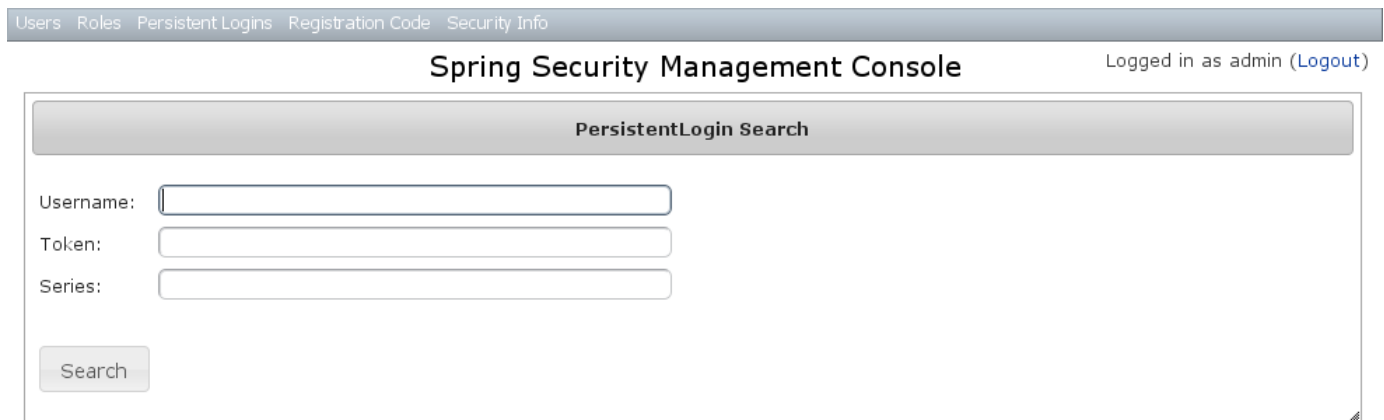
Persistent cookies aren't enabled by default - you must enable them by running the `s2-create-persistent-token` script. See [the Spring Security Core plugin documentation](#) for details about this feature.

The Persistent Logins menu is only shown if this feature is enabled.

8.1. Persistent logins search

The default action for the PersistentLogin controller is search. By default only the standard fields (`username`, `token`, and `series`) are available but this is customizable with the `s2ui-override` script - see the [Customization](#) section for details.

You can search by any combination of fields, and all fields have an Ajax autocomplete to assist in finding instances. Leave all fields empty to return all instances.



The screenshot shows the Spring Security Management Console interface. At the top, there is a navigation bar with links: Users, Roles, Persistent Logins, Registration Code, and Security Info. The main header displays "Spring Security Management Console" and "Logged in as admin (Logout)". Below this is a section titled "PersistentLogin Search". Inside this section, there are three input fields labeled "Username:", "Token:", and "Series:". Below these fields is a "Search" button. The entire form is enclosed in a light gray border.

Searching is case-insensitive and the search string can appear anywhere in the field. Results are shown paginated in groups of 10 and you can click on any header to sort by that field:

PersistentLogin Search

Username:

Token:

Series:

Series	Username	Token	Last Used
dWEAHu/0ueJGJBpoRMFIGQ==	admin	XQkCHT5wbuywP3RY/+zN6A==	07/25/2010

Showing 1 through 1 out of 1.

8.2. Persistent logins edit

After clicking through to an instance you get to the edit page (there are no view pages):

Edit PersistentLogin

Series dWEAHu/0ueJGJBpoRMFIGQ==

Username admin

Token

Last Used

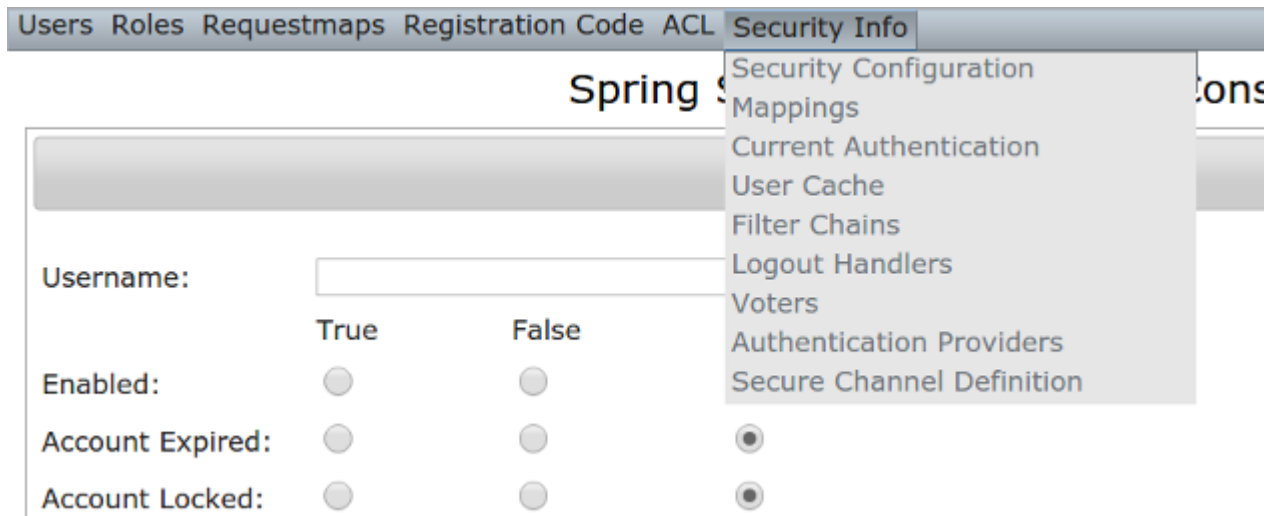
You can update the **token** or **lastUsed** attribute or delete the instance.

8.3. Persistent logins creation

Since instances are created during authentication by the spring-security-core plugin, there is no functionality in this plugin to create new instances.

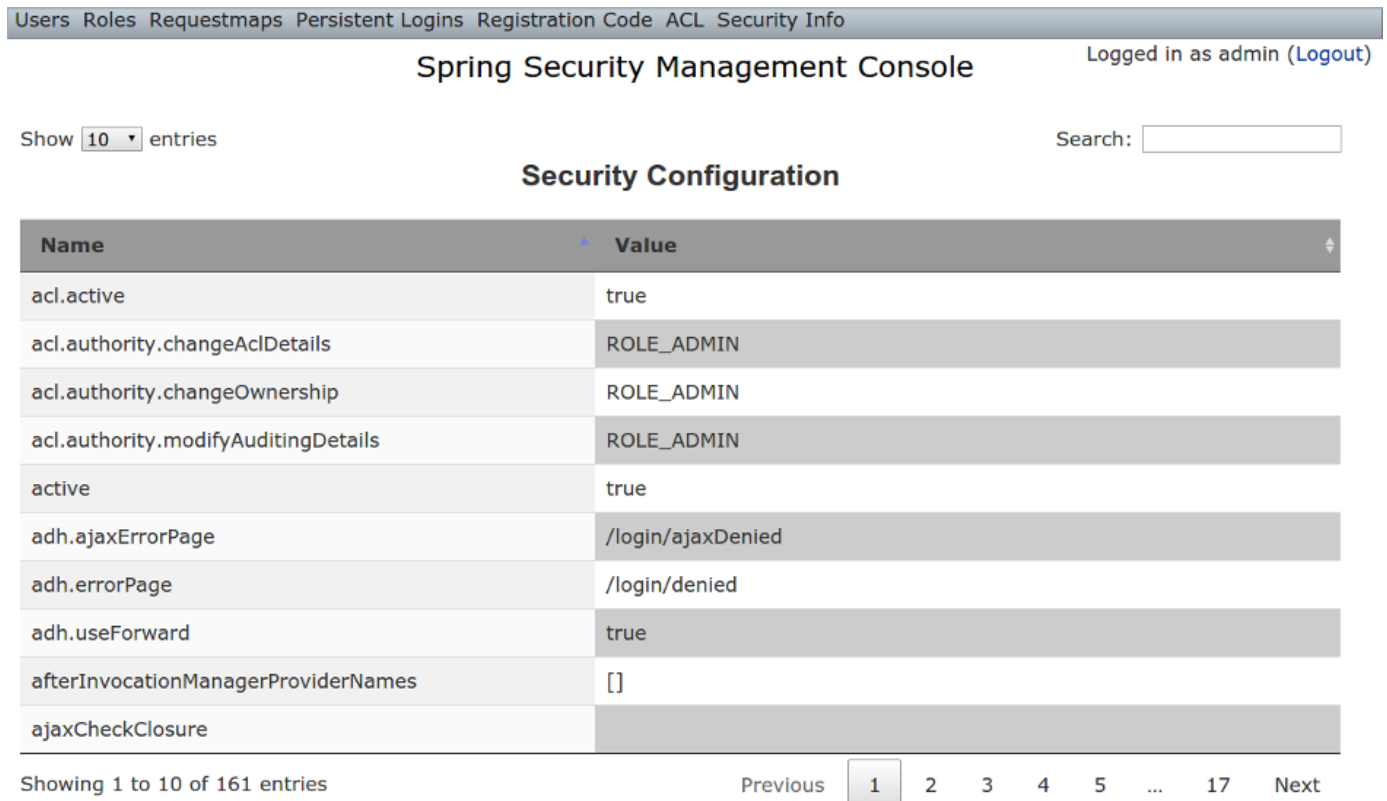
Chapter 9. Security Configuration UI

The Security Info menu has links for several pages that contain read-only views of much of the Spring Security configuration:



9.1. Security Configuration

The Security Configuration menu item displays all security-related attributes in `application.groovy`. The names omit the `grails.plugin.springsecurity` prefix:



9.2. Mappings

The Mappings menu item displays the current request mapping mode (Annotation, Requestmap, or Static) and all current mappings:

UsersRolesPersistent LoginsRegistration CodeACLSecurity Info

Spring Security Management Console

Logged in as admin (Logout)

SecurityConfigType: Annotation

Mappings

Pattern	ConfigAttributes	HTTP Method
/	permitAll	all
/Index	permitAll	all
/index.gsp	permitAll	all
/assets/**	permitAll	all
/**/js/**	permitAll	all
/**/css/**	permitAll	all
/**/images/**	permitAll	all
/**/favicon.ico	permitAll	all
/register	permitAll	all
/register/**	permitAll	all
/registrationcode	permitAll	all
/registrationcode/**	permitAll	all
/securityinfo	permitAll	all
/securityinfo/**	permitAll	all
/login	permitAll	all
/login.*	permitAll	all
/login/**	permitAll	all
/logout	permitAll	all
/logout.*	permitAll	all
/logout/**	permitAll	all

9.3. Current Authentication

The Current Authentication menu item displays your **Authentication** information, mostly for reference to see what a typical one contains:

UsersRolesRequestmapsPersistent LoginsRegistration CodeACLSecurity Info

Spring Security Management Console

Logged in as admin (Logout)

Current Authentication

Name	Value
Authorities	[ROLE_RUN_AS, ROLE_USER, ROLE_ADMIN, ROLE_SWITCH_USER]
Details	org.springframework.security.web.authentication.WebAuthenticationDetails@ffed504: RemoteIpAddress: 127.0.0.1; SessionId: 659C5EEAED7F26774E7214E7F0D35D3D
Principal	grails.plugin.springsecurity.userdetails.GrailsUser@586034f: Username: admin; Password: [PROTECTED]; Enabled: true; AccountNonExpired: true; credentialsNonExpired: true; AccountNonLocked: true; Granted Authorities: ROLE_ADMIN,ROLE_RUN_AS,ROLE_SWITCH_USER,ROLE_USER
Name	admin

9.4. User Cache

The User Cache menu item displays information about cached users if the feature is enabled (it is disabled by default).

[Users](#) [Roles](#) [Requestmaps](#) [Persistent Logins](#) [Registration Code](#) [ACL](#) [Security Info](#)

Spring Security Management Console

Logged in as admin ([Logout](#))

UserCache class: net.sf.ehcache.Cache

User Cache

Attribute	Value
Size	1
Status	STATUS_ALIVE
Name	userCache
GUID	127.0.1.1-458656cf-0031-4216-8f6d-ee25a6438d98

Statistics

Attribute	Value
Cache Hits	1
In-memory Hits	2
On-disk Hits	0
Cache Misses	3
Object Count	1
Memory Store Object Count	1
Disk Store Object Count	0
Eviction Count	0

1 Cached User(s)

Username	User
admin	grails.plugin.springsecurity.userdetails.GrailsUser@586034f: Username: admin; Password: [PROTECTED]; Enabled: true; AccountNonExpired: true; credentialsNonExpired: true; AccountNonLocked: true; Granted Authorities: ROLE_ADMIN,ROLE_RUN_AS,ROLE_SWITCH_USER,ROLE_USER

9.5. Filter Chains

The Filter Chains menu item displays your configured Filter chains. It is possible to have multiple URL patterns each with its own filter chain, for example when using HTTP Basic Auth for a web service. By default since the 3.0.0 release the `spring-security-core s2-quickstart` script configures empty filter chains for static assets to avoid unnecessary security checks (although of course if you need to secure some or all of your static assets you should reconfigure these).

Filter Chains

URL Pattern	Filters
Ant [pattern='/assets/**']	none
Ant [pattern='/**/*.js/**']	none
Ant [pattern='/**/*.css/**']	none
Ant [pattern='/**/*.images/**']	none
Ant [pattern='/**/*.favicon.ico']	none
Ant [pattern='/**']	grails.plugin.springsecurity.web.SecurityRequestHolderFilter org.springframework.security.web.access.channel.ChannelProcessingFilter org.springframework.security.web.context.SecurityContextPersistenceFilter grails.plugin.springsecurity.web.authentication.logout.MutableLogoutFilter grails.plugin.springsecurity.web.authentication.GrailsUsernamePasswordAuthenticationFilter org.springframework.security.web.servletapi.SecurityContextHolderAwareRequestFilter grails.plugin.springsecurity.web.filter.GrailsRememberMeAuthenticationFilter grails.plugin.springsecurity.web.filter.GrailsAnonymousAuthenticationFilter org.springframework.security.web.access.ExceptionTranslationFilter org.springframework.security.web.access.intercept.FilterSecurityInterceptor org.springframework.security.web.authentication.switchuser.SwitchUserFilter

9.6. Logout Handlers

The Logout Handlers menu item displays your registered **LogoutHandlers**. Typically there will be just the ones shown here, but you can register your own custom implementations, or a plugin might contribute more:

Logout Handlers

Class Name
org.springframework.security.web.authentication.rememberme.PersistentTokenBasedRememberMeServices
org.springframework.security.web.authentication.logout.SecurityContextLogoutHandler

9.7. Voters

The Voters menu item displays your registered **AccessDecisionVoters**. Typically there will be just the ones shown here, but you can register your own custom implementations, or a plugin might contribute more:

Voters**Class Name**

org.springframework.security.access.vote.AuthenticatedVoter

org.springframework.security.access.vote.RoleHierarchyVoter

grails.plugin.springsecurity.web.access.expression.WebExpressionVoter

grails.plugin.springsecurity.access.vote.ClosureVoter

9.8. Authentication Providers

The Authentication Providers menu item displays your registered **AuthenticationProviders**. Typically there will be just the ones shown here, but you can register your own custom implementations, or a plugin (e.g. LDAP) might contribute more:

Authentication Providers**Class Name**

org.springframework.security.authentication.dao.DaoAuthenticationProvider

grails.plugin.springsecurity.authentication.GrailsAnonymousAuthenticationProvider

org.springframework.security.authentication.RememberMeAuthenticationProvider

9.9. Secure Channel Definition

The Secure Channel Definition menu item displays your registered channel security mappings.

Secure Channel Definition**Pattern****ConfigAttributes**

Ant [pattern='/secure/stuff/**']

[REQUIRES_SECURE_CHANNEL]

Ant [pattern='/insecure/stuff/**']

[REQUIRES_INSECURE_CHANNEL]

Ant [pattern='/**']

[ANY_CHANNEL]

Chapter 10. Customization

Most aspects of the plugin are configurable.

10.1. s2ui-override script

The plugin's controllers and GSPs are easily overridden using the `s2ui-override` script. The general syntax for running the script is

```
grails s2ui-override <type> <controller-package>
```

The script will copy an empty controller that extends the corresponding plugin controller into your application so you can override individual actions and methods as needed. It also copies the controller's GSPs. The exceptions are 'auth' and 'layout' which only copy GSPs.

The files copied for each type are summarized here:

- `aclclass`
 - `controller/AclClassController.groovy`
 - `views/aclClass/create.gsp`
 - `views/aclClass/edit.gsp`
 - `views/aclClass/search.gsp`
- `aclentry`
 - `controller/AclEntryController.groovy`
 - `views/aclEntry/create.gsp`
 - `views/aclEntry/edit.gsp`
 - `views/aclEntry/search.gsp`
- `aclobjectidentity`
 - `controller/AclObjectIdentityController.groovy`
 - `views/aclObjectIdentity/create.gsp`
 - `views/aclObjectIdentity/edit.gsp`
 - `views/aclObjectIdentity/search.gsp`
- `aclsid`
 - `controller/AclSidController.groovy`
 - `views/aclSid/create.gsp`
 - `views/aclSid/edit.gsp`
 - `views/aclSid/search.gsp`
- `auth`
 - `views/login/auth.gsp`

- layout
 - `views/layouts/springSecurityUI.gsp`
 - `views/includes/_ajaxLogin.gsp`
- persistentlogin
 - `controller/PersistentLoginController.groovy`
 - `views/persistentLogin/edit.gsp`
 - `views/persistentLogin/search.gsp`
- register
 - `controller/RegisterController.groovy`
 - `views/register/forgotPassword.gsp`
 - `views/register/register.gsp`
 - `views/register/resetPassword.gsp`
- registrationcode
 - `controller/RegistrationCodeController.groovy`
 - `views/registrationCode/edit.gsp`
 - `views/registrationCode/search.gsp`
- requestmap
 - `controller/RequestmapController.groovy`
 - `views/requestmap/create.gsp`
 - `views/requestmap/edit.gsp`
 - `views/requestmap/search.gsp`
- role
 - `controller/RoleController.groovy`
 - `views/role/create.gsp`
 - `views/role/edit.gsp`
 - `views/role/search.gsp`
- securityinfo
 - `controller/SecurityInfoController.groovy`
 - `views/securityInfo/config.gsp`
 - `views/securityInfo/currentAuth.gsp`
 - `views/securityInfo/filterChains.gsp`
 - `views/securityInfo/logoutHandlers.gsp`
 - `views/securityInfo/mappings.gsp`
 - `views/securityInfo/providers.gsp`
 - `views/securityInfo/secureChannel.gsp`
 - `views/securityInfo/usercache.gsp`
 - `views/securityInfo/voters.gsp`
- user

- `controller/UserController.groovy`
- `views/user/create.gsp`
- `views/user/edit.gsp`
- `views/user/search.gsp`

10.2. I18N

All of the plugin's displayed strings are localized and stored in the plugin's `grails-app/i18n/messages.spring-security-ui.properties` file. You can override any of these values by putting an override in your application's `grails-app/i18n/messages.properties` file.

10.3. application.groovy attributes

There are a few configuration options specified in `DefaultUiSecurityConfig.groovy` that can be overridden in your application's `grails-app/conf/application.groovy`

10.3.1. Registration attributes

These settings are used in the registration workflow; see the [User Registration](#) section for more details:

- `grails.plugin.springsecurity.ui.register.defaultRoleNames`
- `grails.plugin.springsecurity.ui.register.emailBody`
- `grails.plugin.springsecurity.ui.register.emailFrom`
- `grails.plugin.springsecurity.ui.register.emailSubject`
- `grails.plugin.springsecurity.ui.register.postRegisterUrl`

10.3.2. Forgot Password attributes

These settings are used in the forgot-password workflow; see the [Forgot Password](#) section for more details:

- `grails.plugin.springsecurity.ui.forgotPassword.emailBody`
- `grails.plugin.springsecurity.ui.forgotPassword.emailFrom`
- `grails.plugin.springsecurity.ui.forgotPassword.emailSubject`
- `grails.plugin.springsecurity.ui.forgotPassword.postResetUrl`

10.3.3. GSP layout attributes

The `layout` attribute in the GSPs is configurable. If this is the only change you want to make in some or all of the GSPs then you can avoid copying the GSPs into your application just to make this change.

The default value for the registration workflow GSPs (`forgotPassword.gsp`, `register.gsp`, and

`resetPassword.gsp`) is “register” and the default for the rest is “springSecurityUI”. These values can be overridden with the `grails.plugin.springsecurity.ui.gsp.layoutRegister` and `grails.plugin.springsecurity.ui.gsp.layoutUi` settings.

10.3.4. Miscellaneous attributes

The role name required to be able to run as another user defaults to `ROLE_SWITCH_USER` but you can override this name with the `grails.plugin.springsecurity.ui.switchUserRoleName` setting.

10.4. CSS and JavaScript

The plugin uses the [Asset Pipeline](#) plugin to manage its resources. This makes it very easy to provide your own version of some or all of the static resources since asset-pipeline will always use a file in the application’s `assets` directory instead of a plugin’s if it exists.

Instead of depending on either the jQuery or jQuery UI plugins, this plugin includes its own copy of `jquery.js`, `jquery-ui.js`, and `jquery-ui.css`. Note that the versions are not hard-coded, but instead they take advantage of the feature in asset-pipeline where you can embed Groovy code in a file to specify the name and path.

The layouts use `grails-app/assets/javascripts/jquery.js`, which contains this:

```
//=require jquery/jquery-{grails.plugin.springsecurity.ui.Constants.JQUERY_VERSION}.js
```

This resolves to `grails-app/assets/javascripts/jquery/jquery-2.1.4.js`, and to use your own version, either use the same approach in a file called `jquery.js` or rename your file to `jquery.js`.

Likewise for jQuery UI, the JavaScript file is `grails-app/assets/javascripts/jquery-ui.js`, which contains this

```
//=require jquery-ui/jquery-ui-  
{grails.plugin.springsecurity.ui.Constants.JQUERY_UI_VERSION}.js
```

and the CSS file `grails-app/assets/stylesheets/jquery-ui.css`, which contains

```
/*  
*= require smoothness/jquery-ui-  
{grails.plugin.springsecurity.ui.Constants.JQUERY_UI_VERSION}.css  
*/
```

The JavaScript file resolves to `grails-app/assets/javascripts/jquery-ui/jquery-ui-1.10.3.custom.js`, and to use your own version, either use the same approach in a file called `jquery-ui.js` or rename your file to `jquery-ui.js`.

The CSS file resolves to `grails-app/assets/stylesheets/smoothness/jquery-ui-1.10.3.custom.css`, and to use your own version, either use the same approach in a file called `jquery-ui.js` or rename your file to `jquery-ui.js`.

Use your own `jquery-ui.js` and/or `jquery-ui.css` to override the plugin's.

The `springSecurityUI.gsp` layout includes `grails-app/assets/stylesheets/spring-security-ui.css`, which has no style declarations and only includes other CSS files:

```
/*
*= require reset.css
*= require jquery-ui.css
*= require jquery.jdMenu.css
*= require jquery.jdMenu.slate.css
*= require jquery.jgrowl.css
*= require spring-security-ui-common.css
*/
[source,java]
```

and `grails-app/assets/javascripts/spring-security-ui.js` which has no JavaScript code and only includes other JavaScript files:

```
//= require jquery.js
//= require jquery-ui.js
//= require jquery/jquery.jgrowl.js
//= require jquery/jquery.positionBy.js
//= require jquery/jquery.bgiframe.js
//= require jquery/jquery.jdMenu.js
//= require jquery/jquery.form.js
//= require spring-security-ui-ajaxLogin.js
```

The `register.gsp` layout includes `grails-app/assets/stylesheets/spring-security-ui-register.css`, which has no style declarations and only includes other CSS files:

```
/*
*= require reset.css
*= require jquery-ui.css
*= require jquery.jgrowl.css
*= require spring-security-ui-common.css
*/
```

and `grails-app/assets/javascripts/spring-security-ui-register.js` which has no JavaScript code and only includes other JavaScript files:

```
//= require jquery.js
//= require jquery-ui.js
//= require jquery/jquery.jgrowl.js
```

The remaining JavaScript files are

- `grails-app/assets/javascripts/spring-security-ui-ajaxLogin.js`
- `grails-app/assets/javascripts/jquery/jquery.biframe.js`
- `grails-app/assets/javascripts/jquery/jquery.dataTables.js`
- `grails-app/assets/javascripts/jquery/jquery.form.js`
- `grails-app/assets/javascripts/jquery/jquery.jdMenu.js`
- `grails-app/assets/javascripts/jquery/jquery.jgrowl.js`
- `grails-app/assets/javascripts/jquery/jquery.positionBy.js`

and the remaining CSS files are

- `grails-app/assets/stylesheets/jquery.dataTables.css`
- `grails-app/assets/stylesheets/jquery.jdMenu.css`
- `grails-app/assets/stylesheets/jquery.jdMenu.slate.css`
- `grails-app/assets/stylesheets/jquery.jgrowl.css`
- `grails-app/assets/stylesheets/reset.css`
- `grails-app/assets/stylesheets/spring-security-ui-auth.css`
- `grails-app/assets/stylesheets/spring-security-ui-common.css`

10.5. Password Hashing

In recent versions of the Spring Security Core plugin, the “User” domain class is generated by the `s2-quickstart` script with code to automatically hash the password. This makes the code simpler (for example in controllers where you create users or update user passwords) but older generated classes don’t have this generated code. This presents a problem for plugins like this one since it’s not possible to reliably determine if the domain class hashes the password or if you use the older approach of explicitly calling `springSecurityService.encodePassword()`.

The unfortunate consequence of mixing a newer domain class that does password hashing with controllers that call `springSecurityService.encodePassword()` is the the passwords get double-hashed, and users aren’t able to login. So to get around this there’s a configuration option you can set to tell this plugin’s controllers whether to hash or not: `grails.plugin.springsecurity.ui.encodePassword`.

This option defaults to `false`, so if you have an older domain class that doesn’t handle hashing just enable this plugin’s hashing:

```
grails.plugin.springsecurity.ui.encodePassword = true
```

h4. Strategy classes

The plugin's `SpringSecurityUiService` implements several “strategy” interfaces to make it possible to override its functionality in a more fine-grained way.

These are defined by interfaces in the `grails.plugin.springsecurity.ui.strategy` package:

- `AclStrategy`
- `ErrorsStrategy`
- `MailStrategy`
- `PersistentLoginStrategy`
- `PropertiesStrategy`
- `QueryStrategy`
- `RegistrationCodeStrategy`
- `RequestmapStrategy`
- `RoleStrategy`
- `UserStrategy`

The controllers, taglib, and even the service never call strategy methods directly on the service, only via a strategy interface.

Each interface has a default implementation, e.g. `DefaultAclStrategy`, `DefaultErrorsStrategy`, etc., and these simply delegate to `SpringSecurityUiService` (except for `MailStrategy`, which has `MailPluginMailStrategy` as its default implementation which uses the Mail plugin to send emails). Each of the default implementations is registered as a Spring bean:

- `uiAclStrategy`
- `uiErrorsStrategy`
- `uiMailStrategy`
- `uiPersistentLoginStrategy`
- `uiPropertiesStrategy`
- `uiQueryStrategy`
- `uiRegistrationCodeStrategy`
- `uiRequestmapStrategy`
- `uiRoleStrategy`
- `uiUserStrategy`

To override the functionality defined in one of the strategy interfaces, register your own implementation of the interface in your application's `grails-app/conf/spring/resources.groovy`, e.g.

```
import com.myapp.MyRequestmapStrategy

beans = {
    uiRequestmapStrategy(MyRequestmapStrategy)
}
```

and yours will be used instead.

10.6. Password Verification

By default the registration controller has rather strict requirements for valid passwords; they must be between 8 and 64 characters and must include at least one uppercase letter, at least one number, and at least one symbol from “!@#\$\$%^&”. You can customize these rules with these application.groovy attributes:

Property	Default Value
grails.plugin.springsecurity.ui.password.minLength	8
grails.plugin.springsecurity.ui.password.maxLength	64
grails.plugin.springsecurity.ui.password.validationRegex	"^.*(?=.*\\d)(?=.*[a-zA-Z])(?=.*[!@#\$%^&]).*\$"

Chapter 11. Scripts

11.1. s2ui-override

Purpose

Generates controllers that extend the plugin's controllers and copies their GSPs to your application for overriding of functionality.

The general format is:

```
grails s2ui-override <type> [controllerPackage]
```

The script will copy an empty controller that extends the corresponding plugin controller into your application so you can override individual actions and methods as needed. It also copies the controller's GSPs. The exceptions are when type is 'auth' or 'layout' which only copy GSPs.

See the [Customization](#) section for more details.