CS544 EA

Applications

Spring Security

Spring Security

- Security: establishing who a user is (authentication) and allowing or disallowing actions (authorization)
  - Vital to any serious application.
- In this Spring Security Module we will look at:
  - Authentication in a web environment
  - Requiring Authorization for certain web pages
  - Requiring Authorization for method calls

Basic Example

- We'll create a basic example to show the essentials of Spring Security
  - Configured with Java Config
  - Configured with XML

- Then we'll go into the details of the different parts

WebAppInitializer

```
public class MyWebAppInitializer implements WebApplicationInitializer {

    @Override
    public void onStartup(ServletContext container) throws ServletException {
        // Create the 'root' Spring application context
        AnnotationConfigWebApplicationContext rootContext
            = new AnnotationConfigWebApplicationContext();
        rootContext.register(WebConfig.class, SecurityConfig.class);
        container.addListener(new ContextLoaderListener(rootContext));

        // Create the dispatcher servlet
        ServletRegistration.Dynamic appServlet = container.addServlet("mvc",
                new DispatcherServlet(new GenericWebApplicationContext()));
        appServlet.setLoadOnStartup(1);
        appServlet.addMapping("/");

        container.addFilter("springSecurityFilterChain",
            new DelegatingFilterProxy("springSecurityFilterChain"))
            .addMappingForUrlPatterns(null, false, "/*");
    }
}
```

Load both WebConfig and SecurityConfig

Apply Security Filter to all incoming requests

WebConfig

Normal SpringMVC WebConfig

```
@Configuration
@EnableWebMvc
@ComponentScan("cs544")
public class WebConfig implements WebMvcConfigurer{
	@Bean
	public ViewResolver viewResolver() {
		InternalResourceViewResolver bean = new InternalResourceViewResolver();

		bean.setViewClass(JstlView.class);
		bean.setPrefix("/WEB-INF/view/");
		bean.setSuffix(".jsp");

		return bean;
	}
}
```

Basic SecurityConfig

```
@Configuration
@EnableWebSecurity
public class WebSecurityConfig {
    @Bean
    public UserDetailsService userDetailsService() {
        UserDetails user = User.withDefaultPasswordEncoder()
                .username("user").password("pass").roles("USER").build();
        UserDetails admin = User.withDefaultPasswordEncoder()
                .username("admin").password("admin").roles("ADMIN", "USER").build();
        return new InMemoryUserDetailsManager(user, admin);
    }

    @Bean
    public SecurityFilterChain securityFilterChain(HttpSecurity http) throws Exception {
        http.authorizeHttpRequests(auth -> auth.requestMatchers("/important/**").hasRole("USER"))
                .formLogin(Customizer.withDefaults())
                .logout(Customizer.withDefaults());
        return http.build();
    }
}
```

@EnableWebSecurity

Creates an inMemory use details without encoded passwords (just for demo, not good for production!)

Showing 2 of 3 Web Security Config @Bean Objects

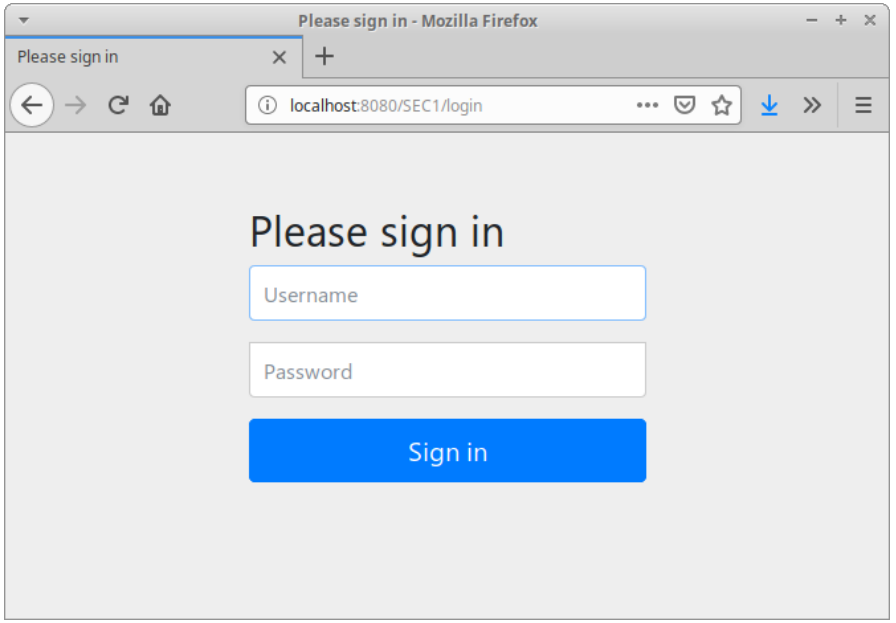
Make sure anyone wanting to access anything under important has the USER role

People can login with a form and logout

Generated login.jsp

You can also write your own

- Spring Security generates a form-login
  - When not logged in and try to access /important/**



Web.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
     xmlns:web="http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
     xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
     id="WebApp_ID" version="3.0">
    <display-name>security</display-name>
    <servlet>
        <servlet-name>SpringMVC</servlet-name>
        <servlet-class>org.springframework.web.servlet.DispatcherServlet</servlet-class>
        <load-on-startup>1</load-on-startup>
    </servlet>
    <servlet-mapping>
        <servlet-name>SpringMVC</servlet-name>
        <url-pattern>/</url-pattern>
    </servlet-mapping>

    <!-- Needed when using Spring with Filter -->
    <context-param>
        <param-name>contextConfigLocation</param-name>
        <param-value>/WEB-INF/springconfig.xml</param-value>
    </context-param>
    <listener>
        <listener-class>org.springframework.web.context.ContextLoaderListener</listener-class>
    </listener>
    <filter>
        <filter-name>springSecurityFilterChain</filter-name>
        <filter-class>org.springframework.web.filter.DelegatingFilterProxy</filter-class>
    </filter>
    <filter-mapping>
        <filter-name>springSecurityFilterChain</filter-name>
        <url-pattern>/*</url-pattern>
    </filter-mapping>
</web-app>
```

Or you can use a web.xml instead of the Initializer class

Automatically loads SpringMVC-servlet.xml

Loads springconfig.xml as root config

Filter applies security

SpringMVC-servlet.xml

Normal SpringMVC Config

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:context="http://www.springframework.org/schema/context"
xmlns:mvc="http://www.springframework.org/schema/mvc"
xsi:schemaLocation="http://www.springframework.org/schema/beans
       http://www.springframework.org/schema/beans/spring-beans.xsd
       http://www.springframework.org/schema/context
       http://www.springframework.org/schema/context/spring-context.xsd
       http://www.springframework.org/schema/mvc
       http://www.springframework.org/schema/mvc/spring-mvc.xsd">

  <!- scan for @RequestMapping annotations-->
  <mvc:annotation-driven />

  <!- scan for @Controller (and other component) annotations in the following package -->
  <context:component-scan base-package="springmvc.helloworld" />

  <!-- Resolves views to .jsp resources in the /WEB-INF/views directory -->
  <bean class="org.springframework.web.servlet.view.InternalResourceViewResolver">
    <property name="viewClass" value="org.springframework.web.servlet.view.JstlView" />
    <property name="prefix" value="/WEB-INF/views/" />
    <property name="suffix" value=".jsp" />
  </bean>
</beans>
```

Springconfig.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
xmlns:sec="http://www.springframework.org/schema/security"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.springframework.org/schema/beans
     http://www.springframework.org/schema/beans/spring-beans.xsd
     http://www.springframework.org/schema/security
     http://www.springframework.org/schema/security/spring-security.xsd">

    <sec:http>
        <sec:intercept-url pattern="/important/**" access="ROLE_USER"/>
        <sec:form-login />
        <sec:logout />
    </sec:http>

    <sec:authentication-manager>
        <sec:authentication-provider>
            <sec:user-service>
                <sec:user name="user" password="{noop}pass" authorities="ROLE_USER" />
                <sec:user name="admin" password="{noop}admin" authorities="ROLE_USER, ROLE_ADMIN" />
            </sec:user-service>
        </sec:authentication-provider>
    </sec:authentication-manager>
</beans>
```

Security namespace

http elements specify
url patterns for security

Authentication manager
/ provider configuration

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