Tests Spring

Dépendances pom.xml

```
    <dependencies>
        ...
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>

        <dependency>
            <groupId>org.springframework.security</groupId>
            <artifactId>spring-security-test</artifactId>
            <scope>test</scope>
        </dependency>
        <!--
https://mvnrepository.com/artifact/org.seleniumhq.selenium/selenium-java -->
        <dependency>
            <groupId>org.seleniumhq.selenium</groupId>
            <artifactId>selenium-java</artifactId>
            <scope>test</scope>
        </dependency>
        <!--
https://mvnrepository.com/artifact/io.github.bonigarcia/webdrivermanager -->
        <dependency>
            <groupId>io.github.bonigarcia</groupId>
            <artifactId>webdrivermanager</artifactId>
            <version>5.6.2</version>
            <scope>test</scope>
        </dependency>
    </dependencies>
```

@WebMvcTest

Tester un composant (Controller, service...)

Controller

```
@Controller
public class HelloController {
  @Autowired
  private HelloService helloService;

  @GetMapping("/hello")
```

```
  public @ResponseBody String helloAction() {
    return helloService.getMessage();
  }

  @ModelAttribute("message")
  public String getMessage() {
    return helloService.getMessage();
  }

  @GetMapping("/hello/view")
  public String helloViewAction() {
    return "hello";
  }

  @GetMapping("/auth/hello")
  public @ResponseBody String authHelloAction() {
    return helloService.getAuthMessage();
  }

  @GetMapping("/hello/js/{msg}")
  public String helloWithJSAction(@PathVariable String msg) {
    return "helloJs";
  }
}
```

Test

Mocking :

- Serveur : `@MockMvc`
- Service HelloService : `@MockBean`

```
@WebMvcTest(HelloController.class)
@ContextConfiguration(classes = {WebSecurityConfig.class,
SpringTestsApplication.class})
class HelloControllerTest {

  @MockBean
  private HelloService helloService;

  @Autowired
  private MockMvc mockMvc;

  @Test
  void helloShouldReturnBonjour() throws Exception {
    // Given
    when(helloService.getMessage()).thenReturn("Bonjour");
    // When
    ResultActions results =
this.mockMvc.perform(MockMvcRequestBuilders.get("/hello"));
    // Then
    results.andExpect(MockMvcResultMatchers.status().isOk())
        .andExpect(content().string(containsString("Bonjour")));
```

```
  }

  @Test
  void helloViewShouldReturnBonjour() throws Exception {
    // Given
    when(helloService.getMessage()).thenReturn("Bonjour");
    // When
    ResultActions results =
this.mockMvc.perform(MockMvcRequestBuilders.get("/hello/view"));
    // Then
    results.andExpect(view().name("hello")).andExpect(model().attribute("message",
"Bonjour"))
        .andExpect(MockMvcResultMatchers.status().isOk())
        .andExpect(content().string(containsString("Bonjour")));
  }
}
```

Tests d'intégration

Test d'intégration avec lancement du serveur sur Random port (pour éviter les conflits).

```
@SpringBootTest(webEnvironment = WebEnvironment.RANDOM_PORT)
class HttpRequestTest {

    @LocalServerPort
    private int port;

    @Autowired
    private TestRestTemplate restTemplate;

    @Test
    void greetingShouldReturnDefaultMessage() throws Exception {
        assertThat(this.restTemplate.getForObject("http://127.0.0.1:" + port + "/",
                String.class)).contains("Hello World!");
    }
}
```

@SpringBootTest & @AutoConfigureMockMvc

Mock du serveur web, remplacé par **MockMvc** :

```
@SpringBootTest
@AutoConfigureMockMvc
@AutoConfigureTestDatabase(replace = Replace.NONE)
class RestUserControllerTest {

  @Autowired
  private MockMvc mockMvc;

  @Autowired
```

```
  private UserService userService;

  private static User testUser;


  @BeforeEach
  public void setup() {
    testUser = userService.createUser("Bob", "Duke");
  }

  @AfterEach
  public void tearDown() {
    userService.deleteAll();
  }

  @Test
  void getAllShouldReturnAllUsers() throws Exception {
    this.mockMvc.perform(MockMvcRequestBuilders.get("/rest/users"))
        .andExpect(MockMvcResultMatchers.status().isOk())
        .andExpect(MockMvcResultMatchers.jsonPath("$.size()").value(1))
        .andExpect(MockMvcResultMatchers.jsonPath("$[0].firstname").value("Bob"))
        .andExpect(MockMvcResultMatchers.jsonPath("$[0].lastname").value("Duke"));
  }
}
```

Test sécurité

Authentification

Autorisations

Mocking :

- Serveur web `MockMvc`
- Roles/Users `@WithMockUser` `@WithAnonymousUser`

```


@SpringBootTest
@AutoConfigureMockMvc
class SecureApplicationTests {

  @Autowired
  private MockMvc mockMvc;

  @Test
  @WithMockUser("admin")
  void authHelloWithAdminShouldReturnAdmin() throws Exception {
this.mockMvc.perform(get("/auth/hello")).andDo(print()).andExpect(status().isOk())
        .andExpect(content().string(containsString("admin")));
  }


```

```
  @Test
  @WithAnonymousUser
  void authHelloWithAnonymousUserShouldReturn401() throws Exception {
this.mockMvc.perform(get("/auth/hello")).andDo(print()).andExpect(status().isUnauth
orized());
  }
}
```

Selenium tests

Tests du comportement côté client

```
@SpringBootTest(webEnvironment = WebEnvironment.RANDOM_PORT)
class SeleniumDemoTest {

  private WebDriver driver;

  @LocalServerPort
  int randomServerPort;

  String baseUrl;

  @SuppressWarnings("deprecation")
  @BeforeEach
  void setUp() throws Exception {
    WebDriverManager.chromedriver().setup();
    ChromeOptions options = new ChromeOptions();
    options.addArguments("--no-sandbox");
    options.addArguments("--disable-dev-shm-usage");
    options.addArguments("--headless");
    driver = new ChromeDriver(options);
    baseUrl = "http://127.0.0.1:" + randomServerPort;
    navigateTo("/hello");
    driver.manage().window().maximize();
    driver.manage().timeouts().implicitlyWait(120, TimeUnit.MILLISECONDS);
  }

  @AfterEach
  void tearDown() throws Exception {
    if (driver != null) {
      driver.quit();
    }
  }

  private void navigateTo(String relativeURL) {
    driver.navigate().to(baseUrl + relativeURL);
  }

  private void fillElement(String name, String content) {
    WebElement elm = driver.findElement(By.name(name));
    elm.sendKeys(content);
  }
```

```
  private void btnClick(String cssSelector) {
    driver.findElement(ByCssSelector.cssSelector(cssSelector)).click();
  }

  private void assertElementContainsText(String cssSelector, String text) {
assertTrue(driver.findElement(ByCssSelector.cssSelector(cssSelector)).getText().con
tains(text));
  }

  private void assertElementAttributeContainsText(String cssSelector, String
attribute,
      String text) {
assertTrue(driver.findElement(ByCssSelector.cssSelector(cssSelector)).getAttribute(
attribute)
        .contains(text));
  }

  public void waitForTextToAppear(String textToAppear, WebElement element, int
timeout) {
    WebDriverWait wait = new WebDriverWait(driver, Duration.ofMillis(timeout));
    wait.until(ExpectedConditions.textToBePresentInElement(element, textToAppear));
  }

  public void waitForTextToAppear(String textToAppear, WebElement element) {
    waitForTextToAppear(textToAppear, element, 3000);
  }

  @Test
  void helloRouteShouldReturnBonjour() {
    assertTrue(driver.getCurrentUrl().contains("hello"));
    assertElementContainsText("body", "Bonjour");
  }

  @Test
  void helloWithJsRouteShouldReturnLength() {
    String msg = "Bonjour";
    navigateTo("/hello/js/" + msg);
    assertTrue(driver.getCurrentUrl().contains("/hello/js/" + msg));
    assertElementAttributeContainsText("#msg", "value", msg);
    btnClick("#bt");
    assertElementContainsText("#length", msg.length() + "");
  }

}
```

Couverture

Intégration de **Jacoco** :

```
    <build>
        <plugins>
            ...
            <plugin>
```

```
                <groupId>org.jacoco</groupId>
                <artifactId>jacoco-maven-plugin</artifactId>
                <version>0.8.11</version>
                <executions>
                    <execution>
                        <goals>
                            <goal>prepare-agent</goal>
                        </goals>
                    </execution>
                    <execution>
                        <id>report</id>
                        <phase>prepare-package</phase>
                        <goals>
                            <goal>report</goal>
                        </goals>
                    </execution>
                </executions>
            </plugin>
        </plugins>
    </build>
```

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