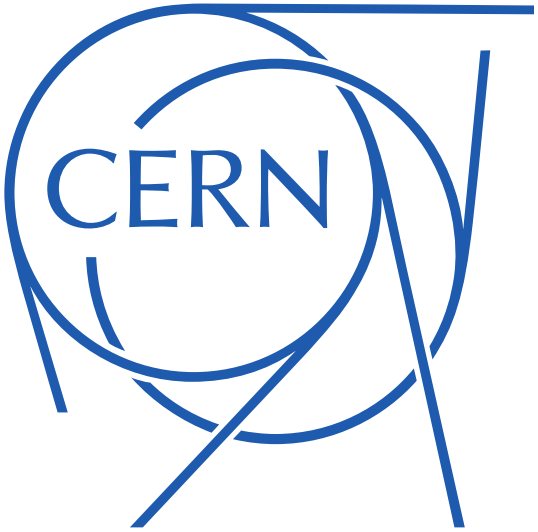

CERN

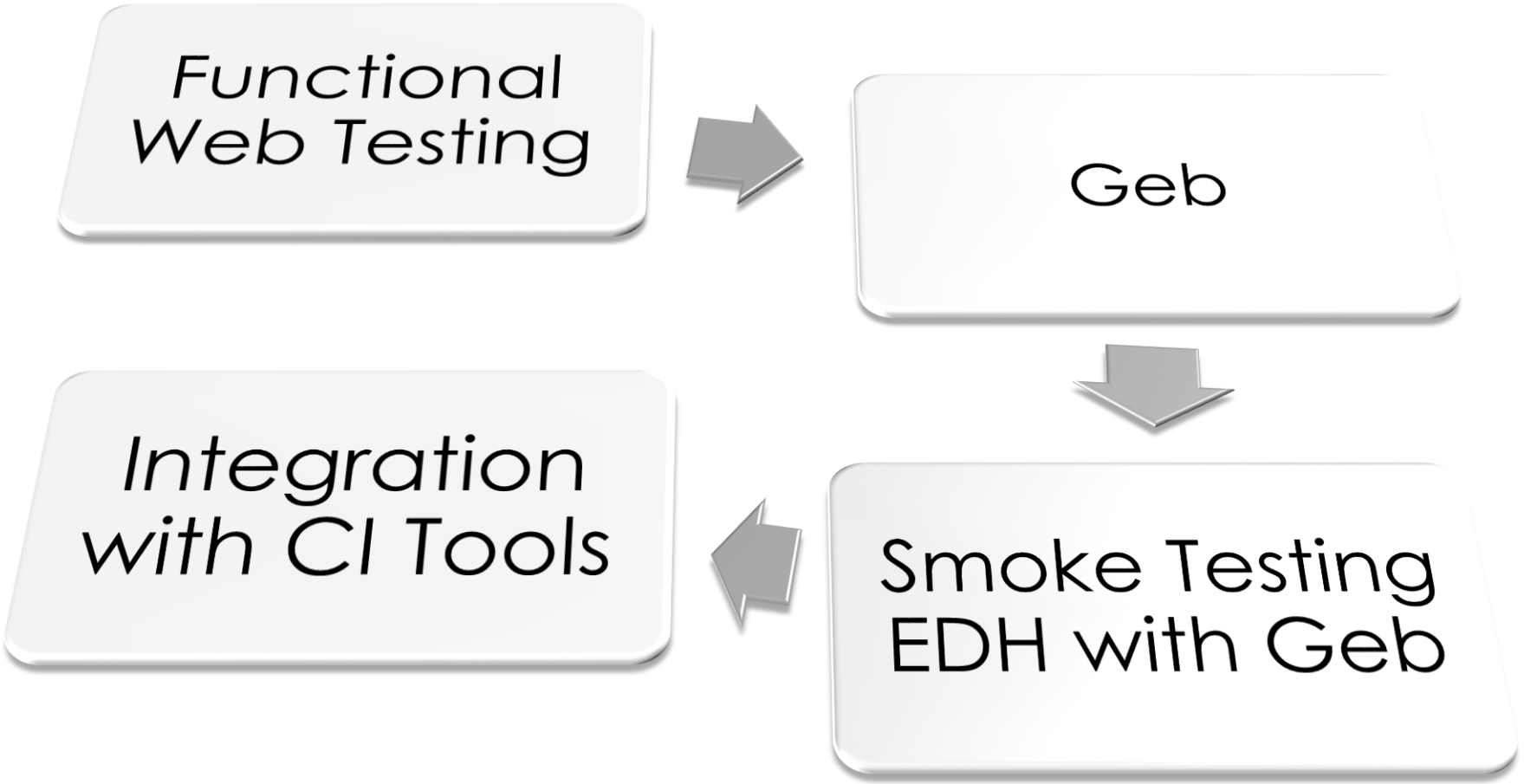
e-Business
Section

Automated Smoke Testing on the JVM with Geb

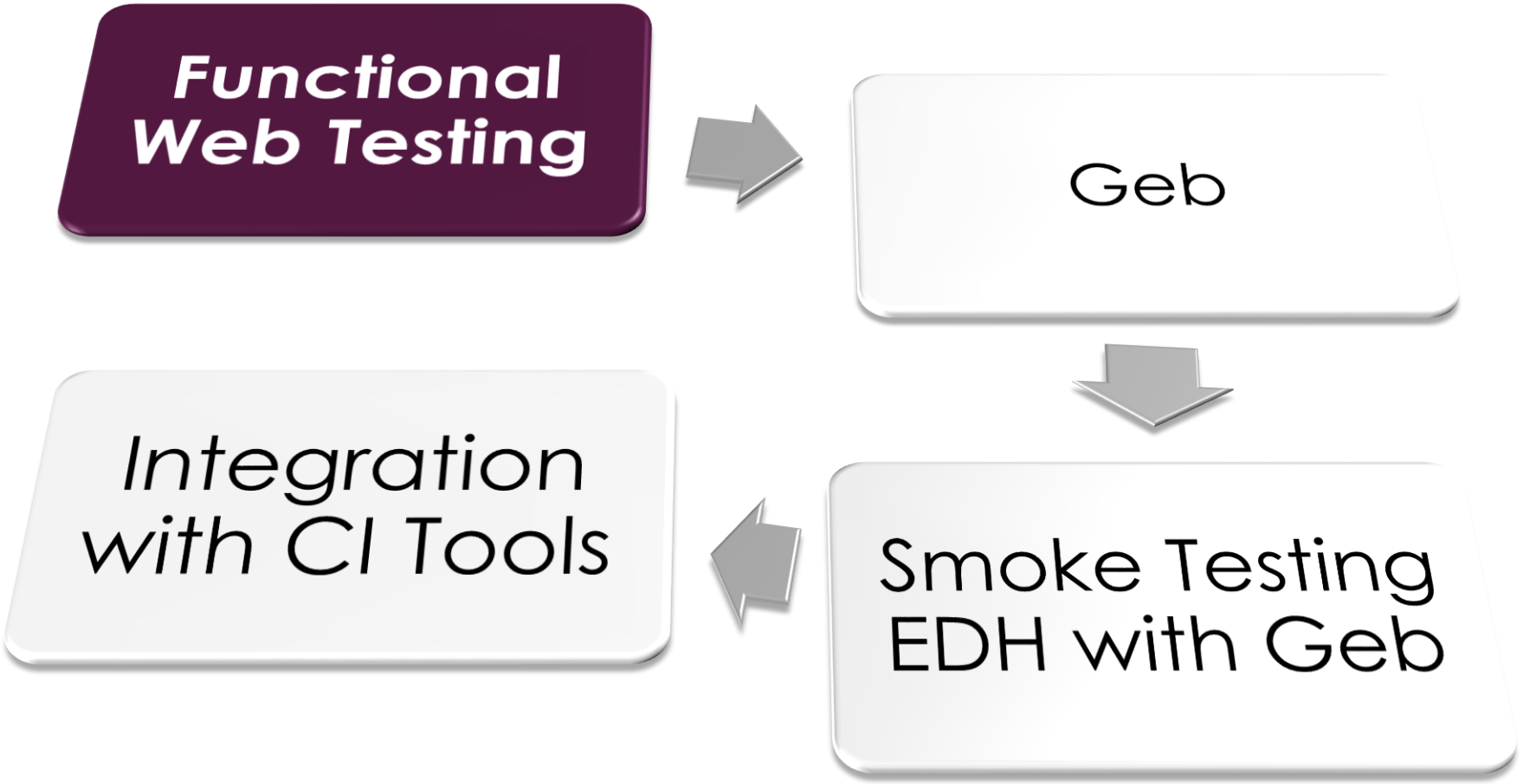
João SILVA (GS-AIS-EB)

1st Developers@CERN Forum

Agenda


Functional Web Testing
Geb
Smoke Testing EDH with Geb
Integration with CI Tools

Agenda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Functional Testing

- Type of **black-box** testing
  - Ignores the specifics of the underlying software component under test
- Asserts that providing certain inputs results in certain outputs
- Contrasts with white-box testing (e.g. unit testing)

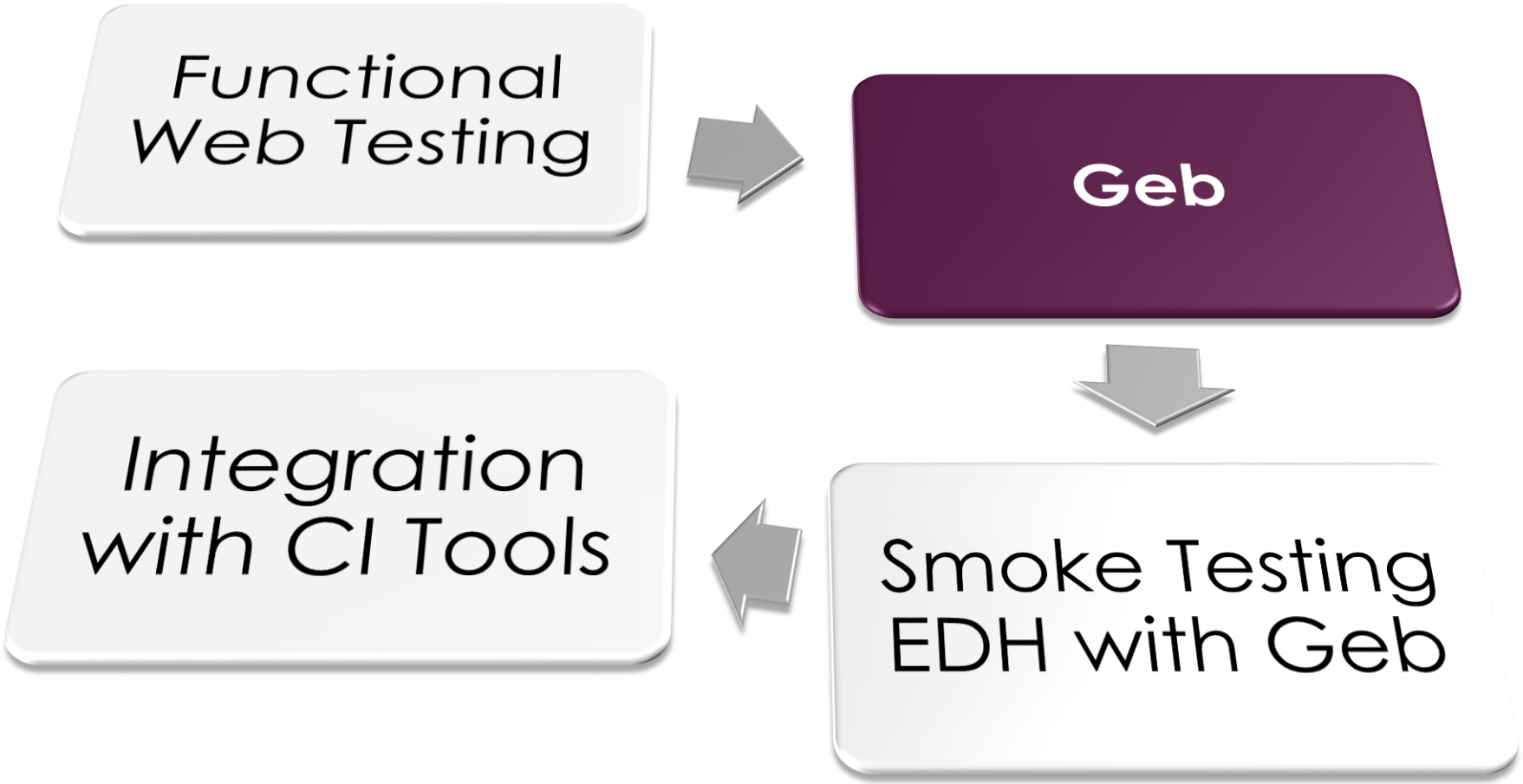
Functional Web Testing

- When developing for the web, **unit testing only goes so far**
  - Unable to test for JavaScript errors in a particular version of a particular browser
  - Unable to identify client-side regressions
  - Unable to test breaking changes in a REST API consumed on the client-side

Functional Web Testing

- Functional web test usually means **programmatically controlling** a web **browser** to simulate the **actions** of a user on a web page
- All application layers are tested at the same time
- Language agnostic

Agenda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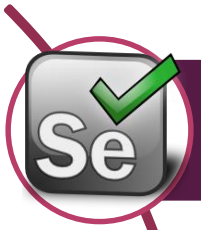
What is Geb?

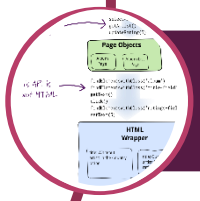
- **Browser automation solution**
- Written in Groovy
- Uses
  - Fuctional/Web/Acceptance **Testing**
  - Scripting
  - Screen scraping
- Current version is 0.12.2
  - But just like winter, version 1.0 is coming!

What's so great about Geb?



Power of **Selenium WebDriver**

Elegance of **jQuery**



Robustness of **Page Object** modelling

Expressiveness of **Groovy**

Power of Selenium WebDriver

- Code -> Driving -> Browser
- De-facto **standard** in the test automation world
- **Cross-browser** support

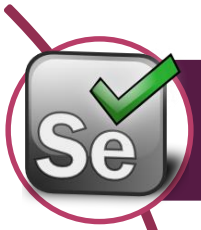
WebDriver Example

```
public class Example {
  public static void main(String[] args) {
    WebDriver driver = new FirefoxDriver();
    // Go to Google
    driver.get("http://www.google.com");

    // Find the text input element by its name
    WebElement element = driver.findElement(By.name("q"));

    // Enter something to search for
    element.sendKeys(“CERN”);

    // Now submit the form.
    element.submit();

    // Check the title of the page
    System.out.println("Page title is: " + driver.getTitle());

    driver.quit();
  }
}
```

WebDriver Example Async

```
public class Example  {
  public static void main(String[] args) {
    WebDriver driver = new FirefoxDriver();

    driver.get("http://www.google.com");

    WebElement element = driver.findElement(By.name("q"));

    element.sendKeys(“CERN”);

    element.submit();

    // Poll until async request is complete
    (new WebDriverWait(driver, 10)).until(new ExpectedCondition<Boolean>()) {
      public Boolean apply(WebDriver d) {
        return d.getTitle().toLowerCase().startsWith("CERN");
      }
    });

    System.out.println("Page title is: " + driver.getTitle());

    driver.quit();
  }
}
```

What's so great about Geb?



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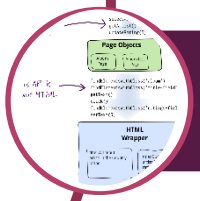


Robustness of **Page Object** modelling

Expressiveness of **Groovy**

Geb Example

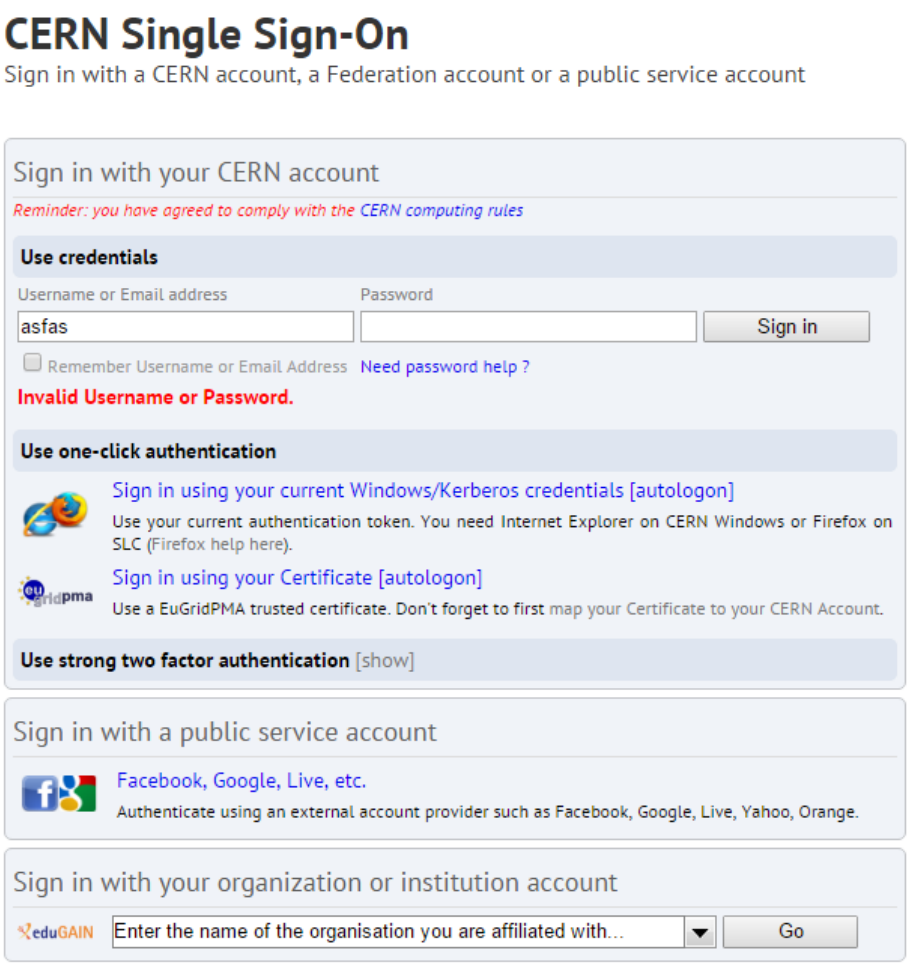
```groovy
Browser.drive("http://www.google.com") {
  def element = $("input", name: "q")
  element << "CERN"
  element << Keys.ENTER

  waitFor { title.startsWith("CERN") }

  def firstResultLink = $("li.g", 0).find("a.l")
  assert firstResultLink.text() == "CERN | Accelerating science"
}
```

With less code, comes less responsability.

Functional Testing with Geb

- Integration with tests frameworks
  - JUnit
  - **Spock**
  - TestNG

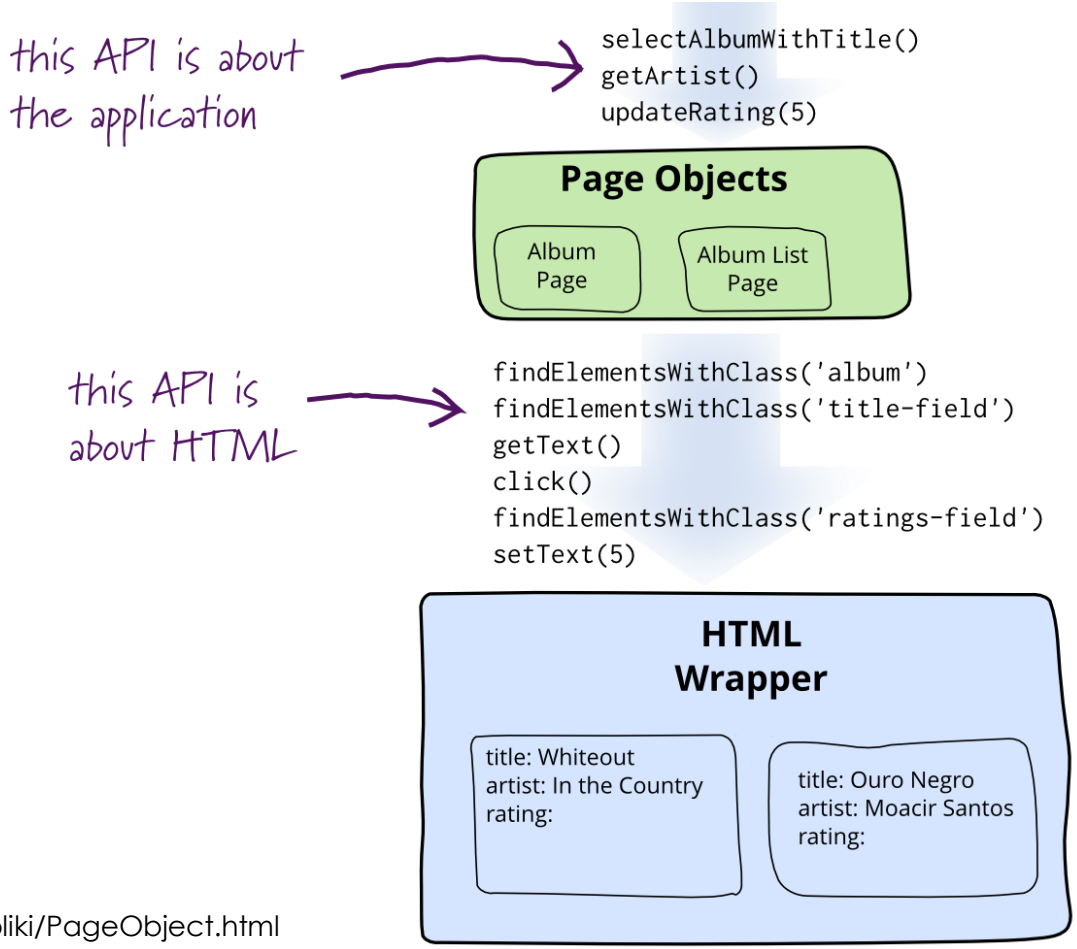
Web Testing CERN SSO Login



CERN SSO Login Spec

```
class CernSsoLoginSpec extends GebSpec {
  def "should redisplay form with an error when password is bad"() {
    when:
    go "https://login.cern.ch"

    then:
    $("#site-name").text() == "CERN Single Sign-On"

    when:
    $("#txtFormsLogin").value("username")
    $("#txtFormsPassword").value("badpassword")
    $("#btnFormsLogin").click()

    then:
    $("#site-name").text() == "CERN Single Sign-On"
    $("#lblFormsError").text() == "Invalid username or password"
  }
}
```

Page Object Pattern



http://martinfowler.com/bliki/PageObject.html

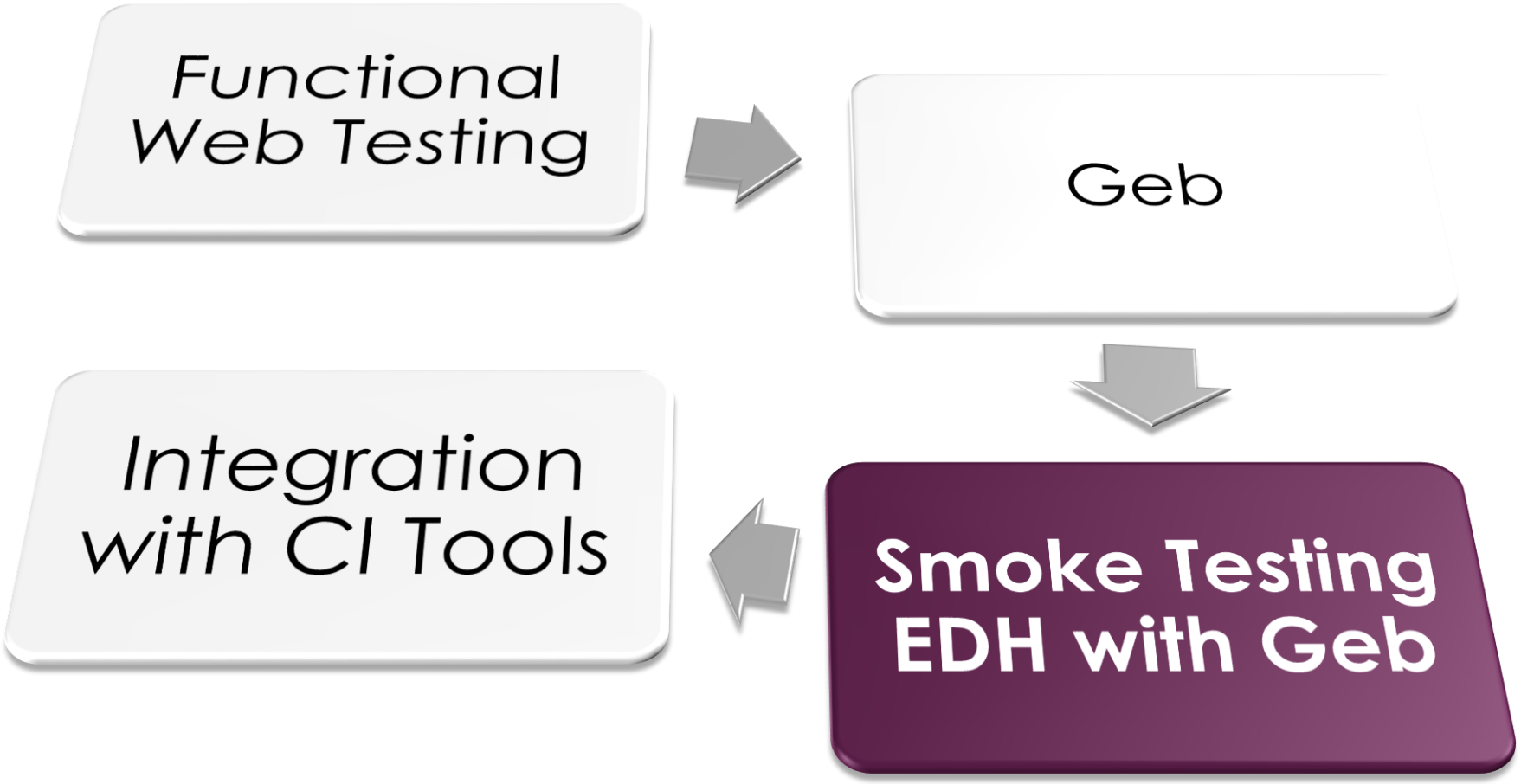
LoginPage

```
class LoginPage extends Page {

  static url = "https://login.cern.ch"

  static at = { $("#site-name").text() == "CERN Single Sign-On" }

  static content = {
    username { $("#txtFormsLogin") }
    password { $("#txtFormsPassword") }
    signIn { $("#btnFormsLogin") }
    errorMessage { $("#lblFormsError") }
  }

  private login(usr, pwd) {
    username = usr
    password = pwd
    signIn.click()
  }
}
```

Login Spec with Page Objects

```
class CernSsoLoginSpec extends GebSpec {
  def "should redisplay form with an error when password is bad"() {
    when:
    to LoginPage

    when:
    login("username", "badpassword")

    then:
    at LoginPage
    errorMessage == "Invalid username or password"
  }
}
```

Agenda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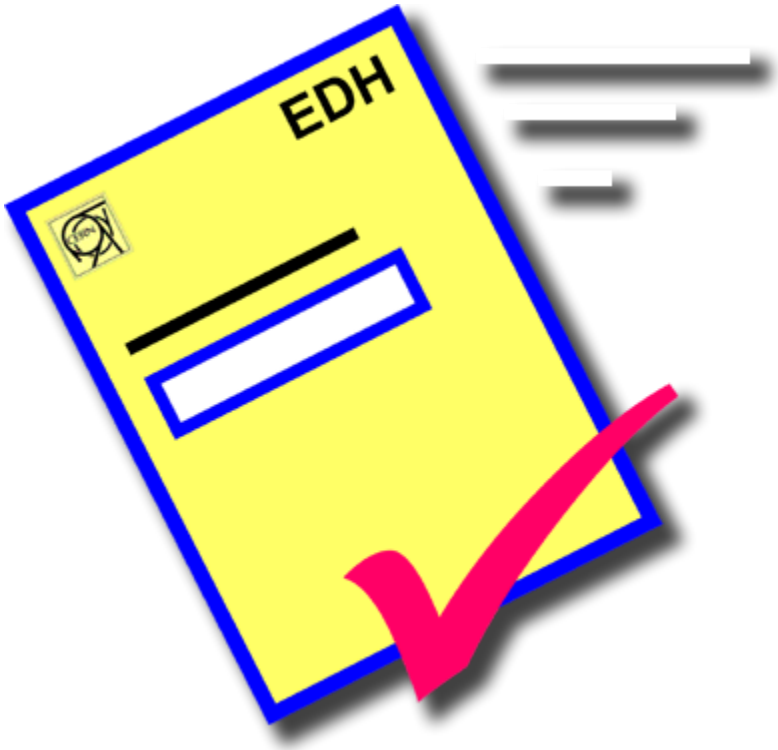
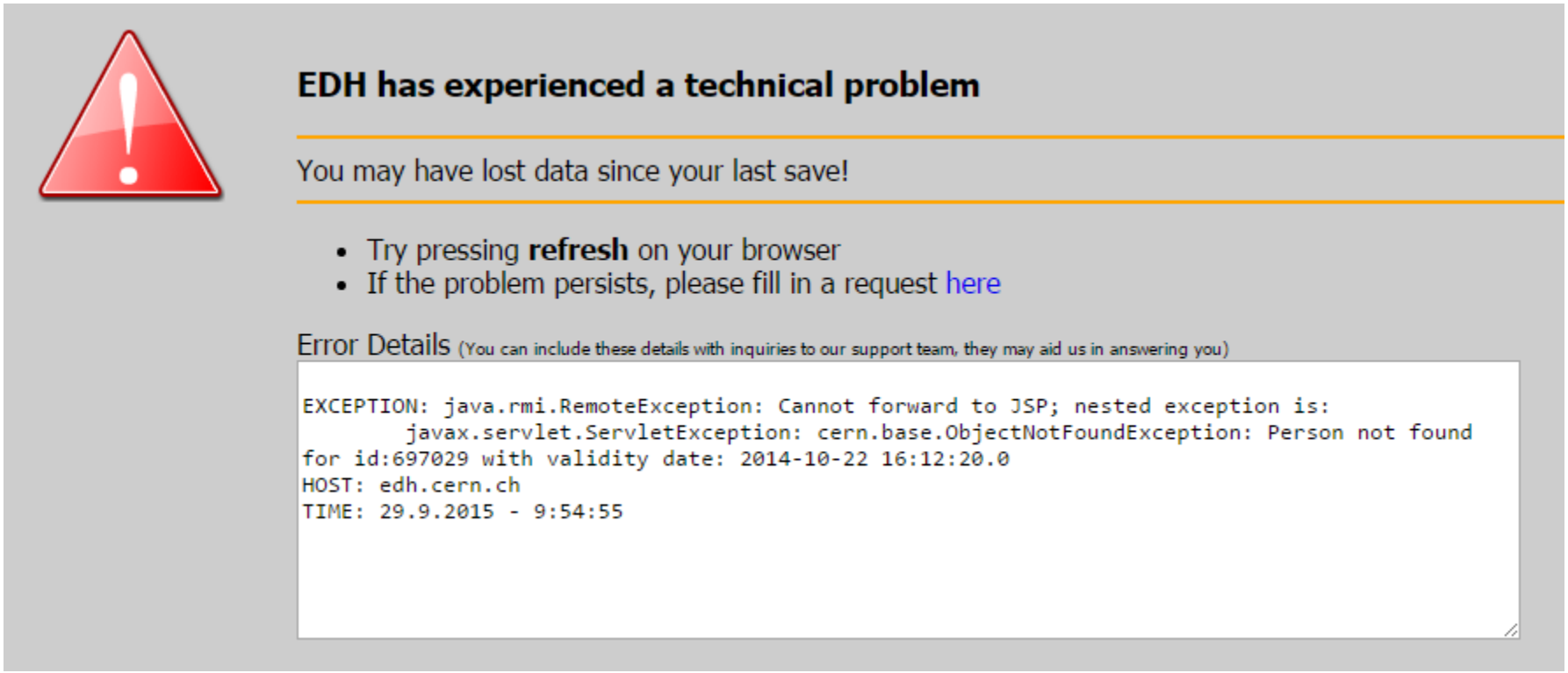
Electronic Document Handling



Electronic Document Handling

- Over **60** official procedures
  - Safety, procurement, finance, HR, etc.
- Over **360k** documents per year
- Over **750k** electronic signatures
- Developed in-house (**1992**), Web (**1998**)
- Over **1 million** lines of Java code

Smoke Testing



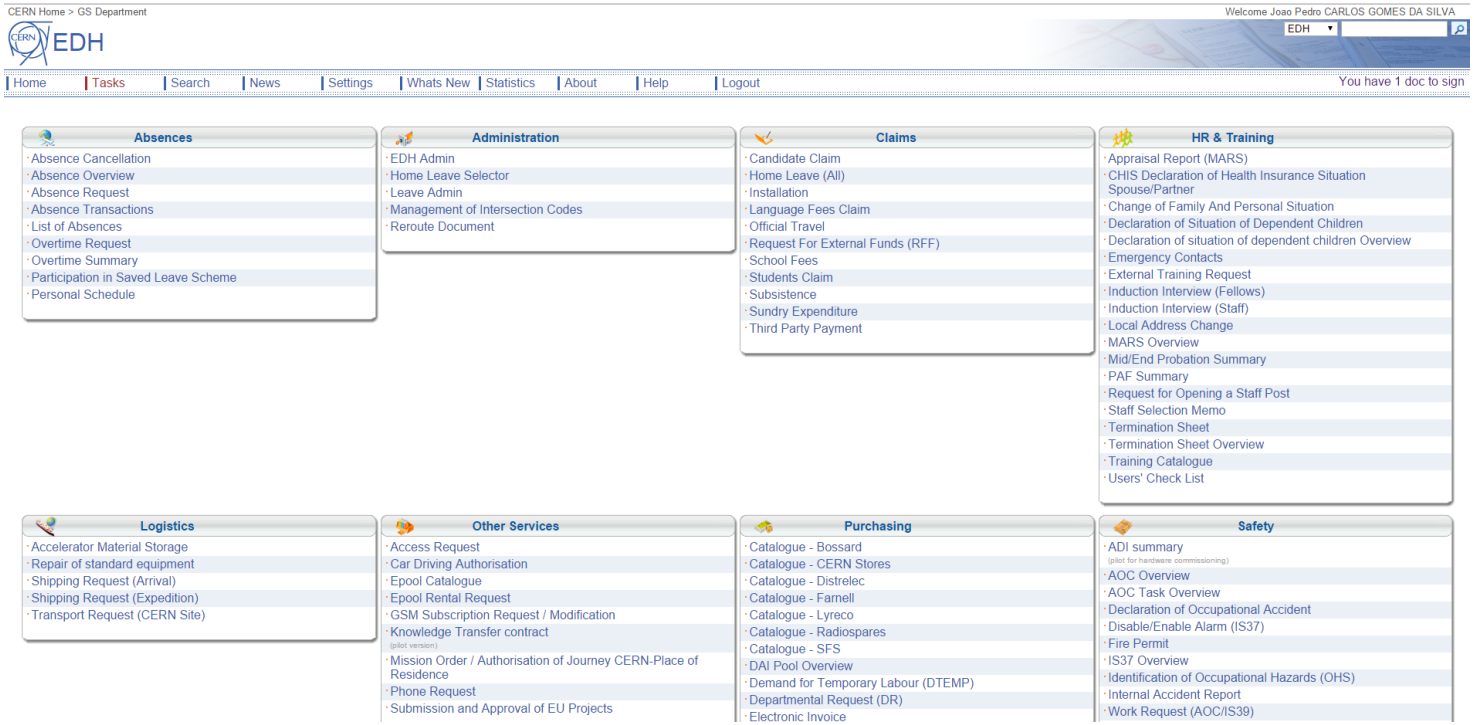
Smoke Testing EDH (1/3)

- Integration with CERN Single Sign-On

```
class EdhBaseSpec extends GebReportingSpec
{
  def "should be redirected to login page and then brought back"() {
    when: "I access EDH Desktop for the first time"
    via DesktopPage

    then: "I'm redirected to CERN SSO-Login"
    at LoginPage

    then: "I login with a service account"
    login()

    then: "I'm redirected back to EDH"
    at DesktopPage
  }
}
```

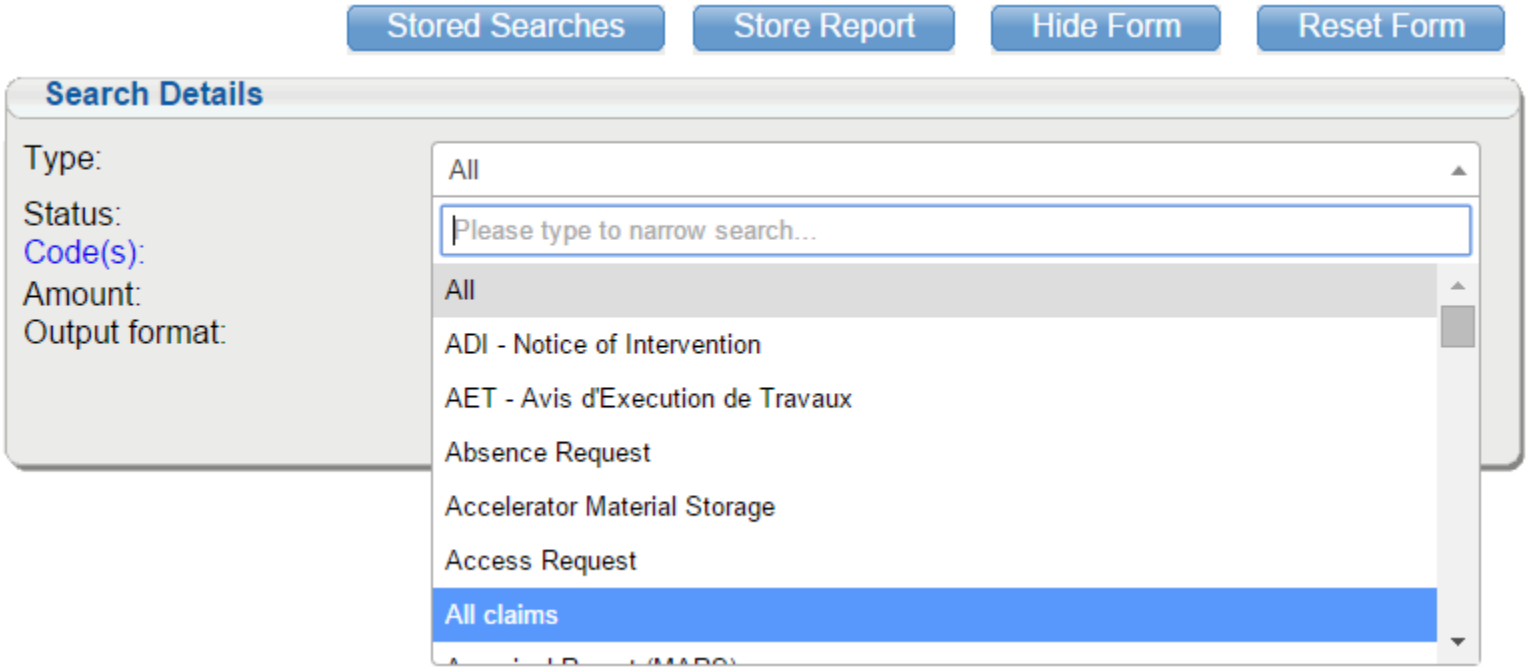
Smoke Testing EDH (2/3)

- Assert that every link/document on EDH Desktop can be opened

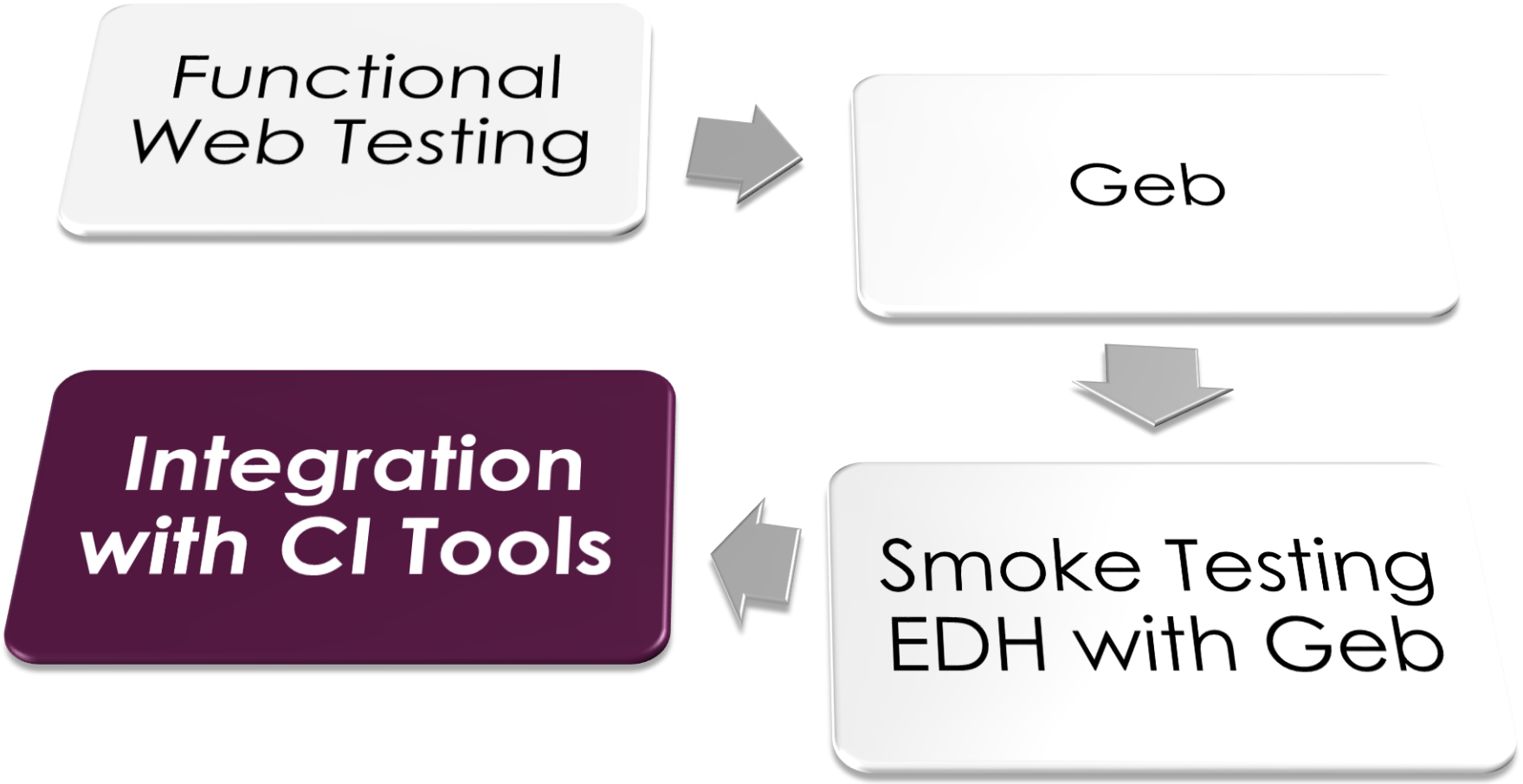


Smoke Testing EDH (3/3)

- Assert that random documents can be opened



Agenda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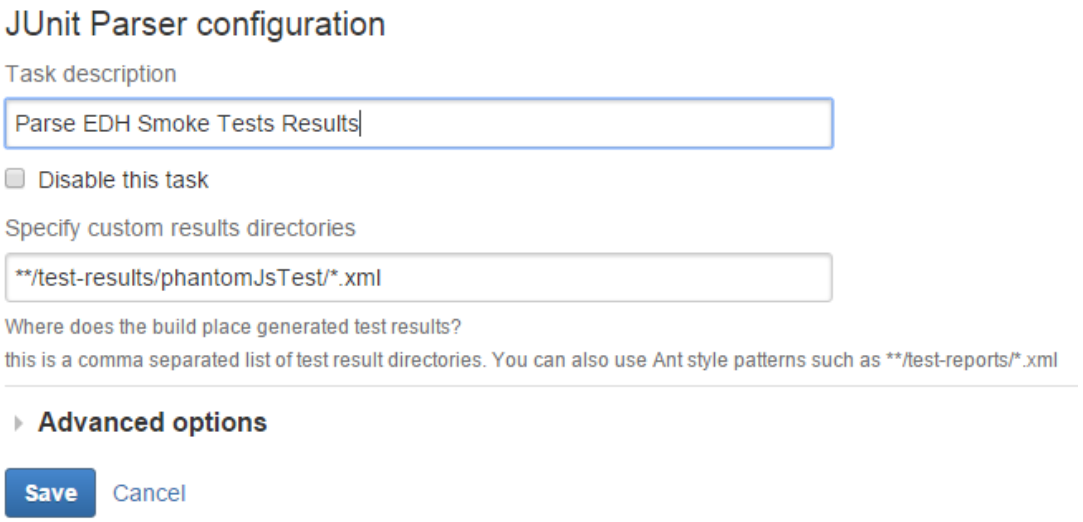
Geb and CI Tools

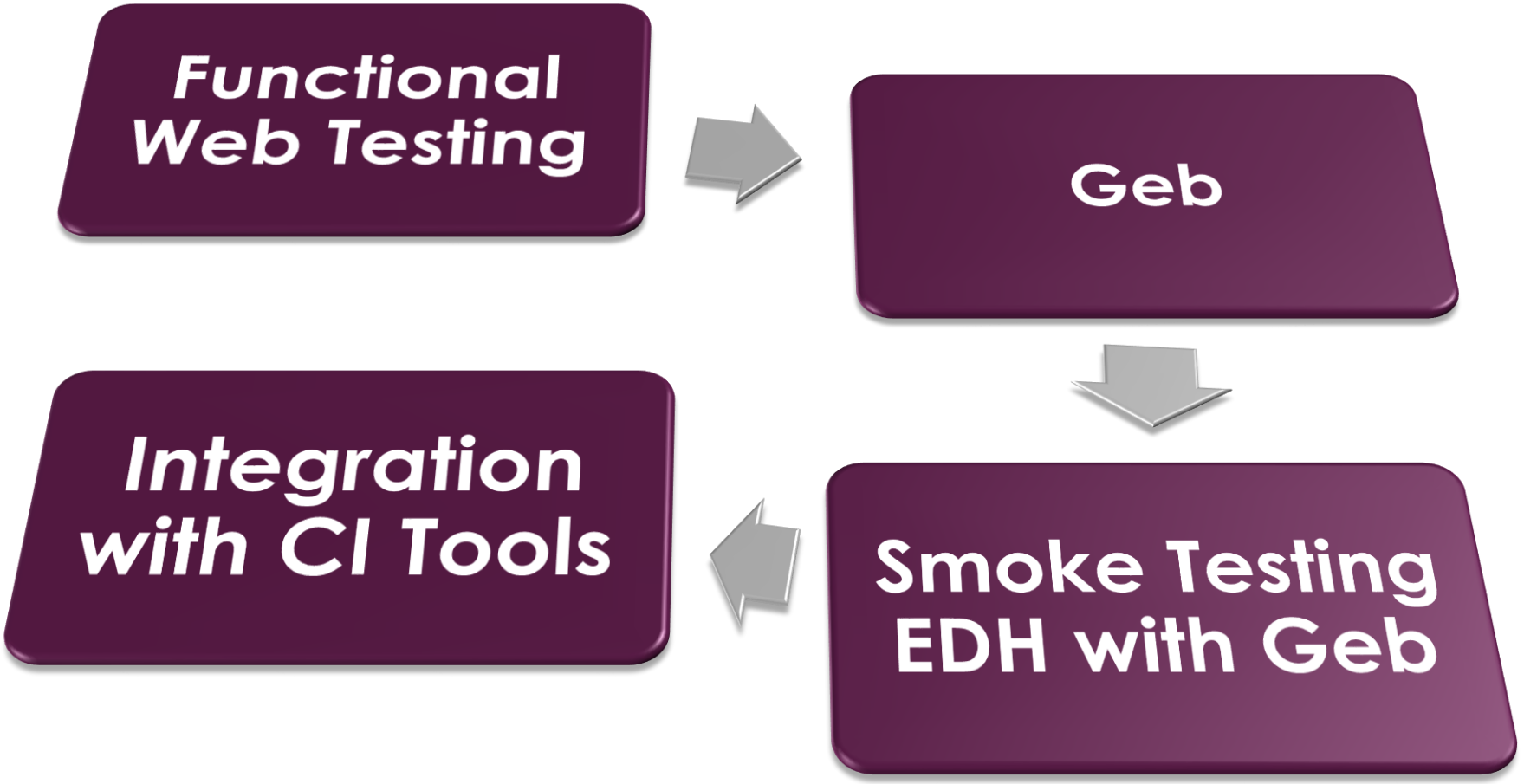
- Geb produces JUnit tests results in XML format
  - Easy to integrate with most CI Tools



Running Geb on a CI Server

- **Problem**
  - CI servers are headless
  - There is no display output for the browser to launch in
- **Solution**
  - Headless browser (e.g. PhantomJS)
  - Virtual framebuffers (e.g. Xvfb)
    - Launch the browser virtually
    - Emulate a graphical display

Agenda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Thank you.

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